

Bonni: [00:00:00] There are plenty of theories about how learning occurs. Today our guest Dr Josh Eyler talks about biology, the brain, and learning.

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Bonni: [00:00:20] Welcome to this episode of Teaching in Higher Ed. This is the space where we explore the art and science of being more effective at facilitating learning. We also share ways to increase our personal productivity approaches so we can have more peace in our lives and be even more present for our students.

Bonni: [00:00:46] Welcome to this episode of Teaching in Higher Ed episode 16. Today I am joined by Dr. Josh Eyler. And Josh, welcome to Teaching in Higher Ed.

Josh: [00:00:57] Thanks very much. Good to be here.

Bonni: [00:00:59] I am going to do my best at giving justice to your experience in higher ed. I know you got your Ph.D. in medieval studies from the University of Connecticut in 2006. You spent some time at Columbus State University as an assistant professor in the English department and then from what I have read and heard as we talked you got a tug. You had a tug to move in a different direction.

Bonni: [00:01:26] Why don't you tell us a little bit about that move and the tug that you felt to go in a different direction from a traditional academic Professor track.

Josh: [00:01:35] Sure absolutely. I had actually as a graduate student read Ken Bain's wonderful book What the Best College Teachers Do.

Josh: [00:01:42] And it sort of opened my eyes to the fact that there was a larger feel the fact of the development and groups of individuals who worked with people on their teaching and had made it a goal for myself one say once they got tenure that this was something that I wanted to pursue.

Josh: [00:02:00] And so when that happened I was fortunate enough to get the opportunity to move to George Mason University in Virginia and take the role of associate director of the Center for Teaching and faculty excellence and most recently have landed at Rice University where I'm the director of the Center for Teaching.

Bonni: [00:02:22] And can you talk a little bit also about some of the other eclectic interests that you have in addition to teaching and learning.

Josh: [00:02:29] Sure a lot of my research in literature has been on Chaucer and other medieval authors but I'm also very interested in the field of disability studies and have done some writing on representations of disability in medieval literature even modern children's literature.

Josh: [00:02:51] So a cluster is a good way to describe it. I think in addition to my focus on teaching and learning. But an interesting way I see it all is informing that all of that informs the rest.

Bonni: [00:03:03] Tell me a little bit about how you see teaching and learning as a scientific enterprise.

Josh: [00:03:10] Yes this is the key I think.

Josh: [00:03:12] I think a lot of the time we use a lot of metaphors to talk about teaching and in many respects you often hear a teacher describe an art or or the teaching as a natural gift.

Josh: [00:03:26] And I think those have merit to some degree but I think the seeing teaching as a science because learning is something that is rooted in our biological mechanisms our brain our cognitive activities are cognitive processes.

Josh: [00:03:46] This allows us to create a model of teaching where everyone can improve everyone can become a good teacher by implementing certain principles that are rooted in science and the biology of learning.

Josh: [00:04:03] So in other words there are there are ways to improve their ways to become better teachers long as we know how how human beings learn and we're going to put those into practice through the lens of our own discipline and always try to emphasize this always kind of paired with a genuine empathy for students and an interest in their development as learners.

Bonni: [00:04:32] Today we're going to talk a little bit broadly about two overarching theories of learning. There are many more than what were discussed today but specifically two that have rattled around in your research a lot recently are brain based learning.

Bonni: [00:04:47] And then the more broad biological theories of learning. So let's start with the brain based learning theory and what works about that and what started to break down as you researched it and have grappled with that.

Josh: [00:05:01] Brain based learning theories they've gone by a variety of names but really over the last few decades and primarily in K through 12 research they've been focused on how we can take information from the cognitive sciences neuro science and kind of psychology and apply it to our work in education and some amazingly important discoveries have been made.

Josh: [00:05:27] I think a lot of a lot of fundamental concepts about the brain and the ways we can use those concepts to design better courses have been have been really influential.

Josh: [00:05:40] One of the things that happened early on was a golf cart was sort of created between scientists and educational researchers and that some some of the early work was criticized for in some cases cherry-picking results from neuroscience.

Josh: [00:05:59] So that made scientists wary of having their their findings applied to education and so on. So in some sense but what is called Brain based learning. I just find just a little bit too limiting both in that sense and in the sense that it looks primarily at neuroscience and in cognitive psychology

Josh: [00:06:21] Also to some degree new fads like using like kind of popular games to expand your cognitive capabilities use brain based learning theories as their hook to be able to sell their product to people and so see that I see the term kind of loaded.

Josh: [00:06:41] I mean I had been using it for for a long time but then a few weeks ago was having a discussion on Twitter with someone from the University of Minnesota named Christina Petersen and she is she was we were just talking about how the biological basis of learning may be a more appropriate kind of phrasing for what we're actually interested in getting from the scientific material.

Bonni: [00:07:08] Let's shift now into that part of the conversation then if brain based learning is to limit teen and some of the things I've read too that are critical of just purely relying on that is that we don't know enough we're still discovering right about the brain

Bonni: [00:07:24] So we can't entirely rest all of our teaching approaches on something that we're still discovering. So let's talk about your shift then to this broader way of looking at learning.

Josh: [00:07:36] Sure. And I say that that's a very important criticism that's been made of that. We are still we're still learning so much about the brain and the research.

Josh: [00:07:47] Some of it's in early phases and things that I do sometimes think so that people might take that too far but there are things that we know for certain about the brain for example that when we learn something the brain changes.

Josh: [00:08:01] And I doubt we could find a neuroscientist who would deny that. And so I think being able to separate what's in the early stages from what has been proven and that we can apply there is a really wonderful book called The New Science of Teaching and Learning by Tracey Tokuhama-Espinosa and she has a whole list in there didn't the exhaustive study of what is known and was this more of a myth. That's a really important criticism.

Bonni: [00:08:25] To anyone who is listening and thinking where's my pen. I have all anything that is mentioned by Josh on the show and by me I'll have all of the links in the show notes and I'll talk about how to find those at the end of the episode but relax you can set down your pen and keep listening and I'll share all of these links as we go.

Bonni: [00:08:42] So tell us about the biological basis of learning.

Josh: [00:08:45] So one of the reasons I think it's important to go that broader is not that we don't have anything else to learn from neuroscience but that it

would help to bolster what we are learning from neuroscience if we expanded our the breadth of our understanding from from neuroscience to also include things like evolutionary biology and human development.

Josh: [00:09:13] Expanding that allows us to kind of expand the biology from simply the brain to more of more of a holistic concept of human biology and how it applies to learning.

Josh: [00:09:24] I think it also provides important context for anything that we are learning and in some ways allows us to create a robust framework for being able to decide what is valuable what can we learn from and apply the education of what what still needs to be developed.

Bonni: [00:09:42] Can you talk a bit about your journey as a teacher and of course now a teacher of faculty in terms of how this learning theory has impacted your approach to teaching.

Josh: [00:09:54] Yes absolutely. Well one thing has not done is I don't see students as you know subjective experiment.

Josh: [00:10:02] That's another criticism that people have levied against it.

Josh: [00:10:06] And I think using it in that way is detrimental to our larger goals. But I have found that understanding teaching and learning as it happens as a science and presenting the scholarly approach to it. If had the scientific data that we can bring to it has really has really created a bridge from some of the anecdotal accounts that you might find about teaching to discussing teaching in a way that really makes sense for faculty.

Josh: [00:10:39] All the faculty I work with I have always worked with our scholars in their disciplines and so talking about teaching in a scholarly way talking about the scientific way has really allowed or helped to talk about teaching in ways that make improving what we do in the classroom and creating better environments for student learning a reality.

Bonni: [00:11:03] Let's look at that a little bit further because I think sometimes people who haven't studied much in this field may interpret the scientific aspects of it to something we can make quantitative that causes a lot of frustration for faculty and that's the student evaluations at the end of the semester.

Bonni: [00:11:21] So can we talk about that that of course has tons of flaws and that would take a lot of time to go into. But where does the scientific approach come in and how is that then different then those course evaluations at the end.

Josh: [00:11:38] Sure I'll give kind of a concrete example. I tend to talk a lot about all of those topics is the issue of prior knowledge. And all of us are interested in finding out what our students know when they come into class with their prior knowledge is how to assess what's strong without prior knowledge and what might what might be incorrect or weaker.

Josh: [00:12:00] Some education research talks about mental models some use more anecdotal approaches but coming at it from a scientific perspective has been really useful and that the faculty with whom I work have really latched onto the notion that prior knowledge which is with a lot of cognitive research and education has shown that prior knowledge is actually a biological construct right.

Josh: [00:12:24] That knowledge is made up of networks of neurons and that it is fixed and it is an actual structure so that we cannot change the prior knowledge our students come in with if they come in with incorrect information.

Josh: [00:12:38] Alexander Hamilton was the president's for example. They come in with as we can't change it we can only build on it and create an environment in which that knowledge would fail in order for them to then build new knowledge on top of that. Easy example uses the bowling ball.

Josh: [00:12:56] The further experiments and since it's come into classes with prior knowledge that heavier things fall faster than lighter things. And the idea that in a vacuum that that would not be true and sometimes conflict with the prior knowledge is already established. So telling a student that's wrong a hundred times will still not change the fact that that knowledge already exists.

Josh: [00:13:20] And so showing a YouTube video of the experiment in action is one way to create an environment that will build upon that week prior knowledge and create something that is more that is not only correct but more substantial.

Bonni: [00:13:37] Tell me about how it would enter in then with something that's more complex that scholars would see the truth from a much different paradigm.

Bonni: [00:13:47] So how do we teach our students in more of the humanities more of an area of great complexity and great debate.

Josh: [00:13:58] In some case well in many cases there was what's happening is not enough or weak knowledge but the necessity to build networks of knowledge. One of the things we know about the brain is that it prizes novelty those kinds of questions are the exact questions that we want to be asking of students rather than more rote memorization based questions. Think that's the first important premise. The sorts of big issues that even scholars wrestle with.

Josh: [00:14:28] I think one of the things we need to keep in mind there is in presenting multiple perspectives on an issue you are there allowing students to wrestle with the difficult material in such a way that they are building knowledge that is useful for interpreting similar situations later on. Does that make sense? You're creating increasingly complex networks of knowledge as opposed to isolated isolated and unique modes of knowledge.

Bonni: [00:15:03] Yeah I was thinking about the other day I was teaching an intro to business class. But being was pretty simple in a format being able to distinguish in this particular case of what we were reviewing distinguishing natural resources from capital

Bonni: [00:15:21] And they needed to understand that natural resources are things like like land and oil and this guy says it isn't land also capital because I own land it's worth something and I thought oh gosh it was one of those situations where for some of the people in the class they're just building a vocabulary that's completely new to them.

Bonni: [00:15:40] They've never taken a business class before. Maybe they're a English major who just got told a lot of actually a lot of times the students who are studying to be physical therapists.

Bonni: [00:15:52] Then they come and the professor says you just need to take one business class to know this entire field because you're going to get in one class and then I thought it was so funny teaching so many different levels of students that all come in with such vastly different prior knowledge.

Bonni: [00:16:08] It's a fun challenge to have. And that was a time where I felt a bit like I stumbled because I thought well yes but some of the people aren't ready to go there yet they don't even know what capital means yet.

Bonni: [00:16:20] It's just a fun challenge as educators I think to be dealing with this prior knowledge and how important that is

Josh: [00:16:27] Definitely a lot of great suggestions in other branches of the scholarship of teaching learning how to assess that prior knowledge how to design the assignments that will allow people to reach students of no matter where they're coming in. And so it is I agree with you that it's a great challenge and one of the wonderful challenges of being a teacher.

Bonni: [00:16:49] Would you share with us about a time that you recall having a failure as a teacher that then shifted your thinking about how we learn how our students learn.

Josh: [00:17:00] Well you know some of that was prior knowledge because I did teach about the Middle Ages of students bring in all kinds of ideas about knights in shining armor and dragons and damsels in distress and things like that.

Josh: [00:17:13] I've learned to talk about to just have a discussion with them about the very first day so that we can then build from there and you know continually assess the blueprint as we're going through.

Josh: [00:17:26] So they didn't always know that especially as a newer teacher assume that people were talking about expert blindspots and assuming that students were coming in with the same frame of reference as the Middle Ages as I had that was. That was an important shift that I made early in my career as a teacher for sure

Bonni: [00:17:47] You work now a lot with new professors or people that are finding new found focus on their own teaching. So if you're starting to talk to someone about hey they're just beginning down a path toward teaching more effectively with biological learning at the forefront. What would be some steps that they could take to get started.

Josh: [00:18:11] There are some really good. There are some really good books out there and some of the some of the work that they would want to look at would be under the rubric of mind the brain and education.

Josh: [00:18:24] In fact Harvard's Graduate School of Education has a new graduate program in mind brain and education which pulls together in neuroscience cognitive psychology and even even some developmental psychology as well.

Josh: [00:18:38] And that's that's a great place to go to just get a sense of what is happening what is going on and then actually the book that really changed the way I started thinking about these things was called The Art of Changing the Brain by James Zull.

Josh: [00:18:55] He was one of the first in the realm of higher education to talk about how neuroscience can have an impact on the way we see teaching as as I've gone on and I have some disagreements with that boat for that has been really influential with shaping the way we think about the college classroom and the science of learning in terms of being a new teacher when you're in front of all sorts of different things that are new and challenging.

Josh: [00:19:21] I think both of those places offer really easy quick access into how do I use it how do I use this information about prior knowledge to help with my class.

Josh: [00:19:36] And one of the areas I'm really interested in the emotional brain and the emotional responses that we have and what am I seeing happening in my class and what might that mean if I better understand how human beings learn and the biology of learning.

Bonni: [00:19:53] What have I not asked you about these theories of learning that are important for someone to understand.

Josh: [00:20:00] It's still well you did ask about this but it's worth underscoring she is still in development and that we have we have lots more questions than we have answers. But what I find so exciting and powerful is that we're starting to ask different kinds of questions now which is you know how how can this material be useful for understanding education.

Josh: [00:20:24] Not that all of that will be or that even most of it will be. But what can we find in science that will help us bridge the gap of what we know and what we don't know. Be helpful as teachers.

Bonni: [00:20:38] One thing I've discovered from talking to you today and also reading a lot of what you post on twitter and your articles and blogs is that at the heart of all this and I'm not sure.

Bonni: [00:20:51] I feel like it has been there but I'd love if you would just touch a little bit on your orientation toward this dune and talking about if we could

spend just a couple minutes about your analogy of what separates us from our students.

Bonni: [00:21:05] Nothing but a breath a comma and I will link to this post because I'm sure we won't be able to do it justice in a couple of minutes but I do think it speaks to your your real spirit of just serving our students and not having there be this great distance between us.

Bonni: [00:21:20] So would you share a little bit about that because I think it does inform a lot of your work.

Josh: [00:21:26] Sure, absolutely. I do think that there are traditional notions of classrooms that that set up our work as hierarchy's and I would like to see those break down because I honestly think that we learned a lot from our students as teachers

Josh: [00:21:46] And I see you know I'm going to be a teacher since I was 5 years old. And part a part of that desire I think was because it is I consider to be not just one of the most challenging professions but one of the most deeply felt personal personal professions as well.

Josh: [00:22:03] And so in a conference paper I gave just in May I. I've always been drawn to the play Wit by Margaret Edson. And there's a scene in there where one of the professors is making a comparison to two life and a comma and saying how how thinly we are actually separated from from any other part of the world.

Josh: [00:22:25] And I really do see that metaphor the idea of a comma that adds and brings up as being especially powerful for work in the classroom. The student teacher learners not much really separates us and if we actually approach our material and our work as teachers in a more unified way that all of us in the classroom are working together towards a common goal that we can actually we can really move education forward in really powerful ways.

Bonni: [00:22:58] There was a video circulating around Twitter and different places that had some professors from lots of different institutions reading aloud their evaluations from students and talking to a lot of fun and I will confess to finding it quite hysterical and I'm sure if I pressed play right now I would chuckle once again to the comic nature of some of them.

Bonni: [00:23:21] However I also recognize the danger and I think that that's healthy to have these where you can start to connect with people who can resonate with some of our challenges and the absurdity of some things that we see.

Bonni: [00:23:36] But I do think when we spend too much of our time and place too much of our attention on the poking fun of our students and the oh those young whippersnappers if they know that too much focus can really have a negative effect because it's going to be changing how we perceive the students that are a lot more like us than perhaps we would care to admit.

Josh: [00:24:00] Oh that's a great way to phrase it too. I agree this is part of the reason I say that empathy is the foundation for all good teaching.

Josh: [00:24:09] But in this particular case I mean you're right teachers are human beings and everyone needs an outlet to express the frustration that but I do also feel very strongly that it's a kind of a vulnerability in teaching learning interaction that students put themselves in a very vulnerable place willingly to say I don't know this will you please help me learn that.

Josh: [00:24:34] And that's that's the kind of that's the sort of move that. I mean it's almost sacred trust that they're doing this and that we have to take that and value it very highly. And so by them doing that by them putting themselves in that kind of vulnerable position to then do anything to dishonor that by criticizing students in public. You see it a lot a lot on social media Facebook and Twitter.

Josh: [00:25:08] People here complain about students and to a certain extent it's venting. But it can cross the line into disparaging the important connection and relationship that makes teaching and learning so successful and it could happen

Bonni: [00:25:24] On the topic of recommendations. Josh, I'm going to give you a minute to think about it and for mine I want to share. I've mentioned this in a blog post but in case anyone missed it. I love the podcast app called Overcast

Bonni: [00:25:38] And Overcast is there are a lot of podcasts catchers out there and this one I just have found to be incredibly easy to use and also powerful. It's a free one. It's called freemium so they're wanting to try it out and then for \$4.99 you can unlock some additional features.

Bonni: [00:25:56] I'm going to mention a couple of things that has a technology called Smart speed. I've never seen this in any other podcast app before but it takes out the silences and shortens the length of the podcast without it sounding as artificial as when we speed it up to time and a half or two times and then they sound like cartoon characters.

Bonni: [00:26:17] It's amazing to listen to because the voices just sounds so natural but you are able to get through a lot more podcasts on your drive. They also have a feature called Voice boost where it normalizes the volume so the speaking is loud and clear, but you don't find the great ebbs and flows for people that haven't invested in the podcast equipment that we have that does that for you on our end of things and great things with playlists and it's just really clear and easy to use so you get to know it more you can use more of the features but it's worth a mention that the overcast app and I will put a link to that in the show notes.

Bonni: [00:26:52] Josh, how about you what is your recommendation for the listeners?

Josh: [00:26:56] Well I have two I think. I had just mentioned this play but if you love teaching and you've never seen the play Wit by Margaret Edson I would recommend going out right away and renting the HBO version that came about maybe 10 years ago now that Emma Thompson in the lead. It is amazingly powerful. I think it helps you rethink what it means to be a teacher.

Josh: [00:27:22] And also I have always found in terms of tips the faculty focus newsletters that comes out frequently I mean you can even if you just google the focus you find. I find I find that as well as Tomorrow's Professor out of Stanford has been wonderful easy to digest tips that come out on a frequent basis.

Josh: [00:27:46] Lots of people find that to be a valuable source of new information about teaching new approaches and just in general ways to kind of keep spicing up what it is that we do in the classroom.

Bonni: [00:27:59] I am looking forward to having you on the show next time already and we haven't even pressed the stop button on this time Josh, thank you so much for joining me today and taking a risk on a stranger you've never met before.

Bonni: [00:28:11] I wonder as we close would you tell people quick about your book and when it's coming out. And then I already will commit to having you

back on the show because it would be great to talk with you then. Tell us about your book and then we'll close.

Josh: [00:28:21] Sure and I appreciate it Bonni.

Josh: [00:28:24] It should be out in 2016. Actually there's a little bit of time. It's based on a lot of what we've been talking about today. It's called How Human Beings Learn: A New Paradigm for Teaching in Higher Education and really delves into all the areas that we might consider when we think about the biology of learning and why that will help us as teachers as a part of it.

Josh: [00:28:47] I'm actually going around and interviewing and observing the classes of some award winning teachers so it's rooted in actual classroom practice to which I think it's at least helps me. When I when I read new works on teaching and learning

Bonni: [00:29:04] Oh that's fantastic. I had no idea it was 2016 so I can't wait that long we will have to have you back sooner than that. Thanks so much.

Bonni: [00:29:12] Thanks Bonni.

Bonni: [00:29:15] Thanks for listening to today's Teaching in Higher Ed with our guest Dr. Joshua Eyler. I encourage everyone listening if you haven't already to subscribe to the weekly newsletter is our weekly 2000 articles and the notes from each podcast that comes straight into your e-mail inbox.

Bonni: [00:29:31] And also if you subscribe you'll receive the free educational technology essentials guide also would appreciate it if you'll tell someone else about the show. Or consider writing a review on iTunes or stitcher. Thanks so much for listening and thanks again to Josh Isler.

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