

Bonni [00:00:00] It's a great way to get our students thinking deeply in the classroom today. Peter Newbury joins me to discuss peer instruction and using clickers in the higher ed classroom.

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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 [00:00:48] Joining me today on episode 53 of Teaching in Higher Ed is Peter Newbury from University of California San Diego and he works with graduate students postdocs and faculty teaches them about teaching and learning in higher education.

Bonni [00:01:04] And also helps them adopt evidence based instructional practices like one of the ones we'll be talking with us about today. Peer instruction and before joining UC San Diego, Peter was a science education specialist and he also before that taught college and university level math and astronomy welcome to the show Peter.

Peter [00:01:26] Thank you Bonni I am really look forward to this.

Bonni [00:01:28] So what doesn't show up in your bio your official bio that we should know about you before we dive in and start talking more about clickers and peer instruction.

Peter [00:01:38] What shows up in my bio is a long background in STEM science technology engineering and math. That's what I studied when I was a student

and then that's what I taught coming out of grad school when I taught math and then taught astronomy and then physics.

Peter [00:01:53] Here at UC San Diego for the last three years. I've had this opportunity to learn about what happens elsewhere on campus besides the science buildings that doesn't I have to update my bio for that. I'm not just a science person anymore. Boy I'm really happy to say.

Bonni [00:02:11] Well I bet there would be a lot of surprises in that. I mean you come from a field that is typically difficult for some of our students to grasp. And I mean not that any of our fields don't wind up being challenging in their own ways. What are some of the surprises you discovered from going from more STEM orientation to to other aspects of higher ed.

Peter [00:02:31] Certainly what happens in a science classroom is different than what happens in a social science classroom or like arts and humanities class. In fact what happens in any classroom is different. What happens in physics is different than what happens in chemistry which is different than what happens in a visual arts or literature course to.

Peter [00:02:49] Well there's lots of things that are different. But there's a lot of underground background material that's the same. I mean after all it's for the most part it's the same students it's the same freshmen walking through the doors who have to go from their physics class over to their lit class and then over to their English class.

Peter [00:03:07] Those are the ones we're trying to figure out what to do with. They still need to know how to learn. They don't need to be metacognitive we still need to make our classrooms active as different as they seem in the course calendars and with courses cursive. I'm happy to say that there's quite a bit of stuff in common.

Bonni [00:03:20] Well I would love to hear Peter from you and I've got a story too of the first clickers that you ever used and I know that you work for the University of California and I used to work at UC the University of California Irvine.

Bonni [00:03:33] And the first clickers that I ever used there were about the size of two HP calculators put together if they were glued together. And I remember what it was like it was not a traditional academic class it was a workshop for senior level leaders in the University of California.

Bonni [00:03:51] And I can remember every time that the presenters would come in and ask a question with one of those very this is I don't know when they purchased that set of clickers but we used to trade them back and forth between the U.S. campuses when they would do larger events and such. I just remember what my mind would do it would instantly engage if they were long days its hard for any of us to sit through.

Bonni [00:04:12] An 8 to 5 workshop that kind of thing and they really really did tricks on my mind and of course that was just my anecdotal experience. But I'd love to hear about your first experience with clickers either as a student or as a faculty member. And then kind of what you saw them do to either your mind or your students minds.

Peter [00:04:31] I was fortunate to be in Vancouver at the University of Columbia with this Karl Limond science education initiative just about the time people really started looking at peer instruction and looking at clickers that the first generation that I ran across were like I say it looked a little bit like an HP calculator.

Peter [00:04:50] And it was infrared and you had to point this thing where the students have to point their clicker at a receiver somewhere in the front of the room. It kind of looks like you were clicking a TV remote when someone asked a question every student would pick up their clicker and they would point at the front and they would click.

Peter [00:05:06] And the infrared had some problems. Well we know any kind of a piece of technology in the classroom that goes wrong it's hard to come back from those things and the instructor. So I'm happy that these days the technology is getting better and better here in the UC San Diego.

Peter [00:05:21] We used to use the iclicker system iclicker two which is radio instead of infrared. So I don't need to worry about pointing at the screen although all students still pick up their clickers and point them at the front of the room. It's a hard habit to break.

Peter [00:05:36] You know one of the one of the things that I've learned using peer instruction more is how much I've learned from my colleagues who use cards. They use colored ABC cards. You answer a question you vote by holding up your card and it's not the technology it also the piece of paper you can achieve almost everything.

Peter [00:05:56] Maybe even more or equal using this piece of paper. I certainly don't want to say that in order to use peer instruction you need to have this electronic clicker. It's not about the clicker. It's about what happens around it.

Bonni [00:06:09] Yeah. The next one I dumped to was similar to the iclicker twos that you're referring to and that's through Turning Technologies and they have audience response solutions of my own a set of about 55 or 60 of them and have since then moved away from them not because they're not wonderful devices.

Bonni [00:06:26] But simply because so many students today in the classroom have smartphones are you finding shifts in terms of your own support or your own teaching. With the advent of so many students having smartphones in the classroom.

Peter [00:06:41] We're certainly hearing more and more students ask if they could use their smartphone instead and have instead of having to buy a clicker at the bookstore. I mean it's true the clickers not let's not the expensive of the textbook but still you've got to shell out 50 bucks or something to get your clicker. Where I have this phone in my pocket. Why can't I just use that.

Peter [00:06:59] On the one hand there's often technical issues in a large classroom and that when I pose a question for my students I need all 300 of them to simultaneously vote often. We don't have the infrastructure in these large classrooms that are 300 people on the Wi-Fi can simultaneously connect. That's one thing we're having to battle against.

Bonni [00:07:20] I imagine there would be an advantage of just the focus. You've got that clicker sitting there that what it does is answer questions that doesn't go on Twitter and it doesn't go on Facebook or Instagram or all of the other lovely distractions that are potential. That probably helps too with the focus. I would guess.

Peter [00:07:36] That's true. If you have a phone in your hand you're more easily distracted. I mean that's you and I do that at a meeting a staff meeting or any meeting we go to as soon as our attention starts to fade.

Peter [00:07:47] Whatever we do we like pull out her phone and check on something the students are just the same as us. So that is one of the nice things about using a specific thing like the clicker is that it's there. This is the only thing it does. And it's less distracting.

Bonni [00:08:01] Now you've started to allude to this whether we're using physical devices such as clickers or if we as a university might have an option of the smartphone or tablets. They're really just tools. And I'd love to shift gears now and have you tell us a little bit about the foundations of peer instruction.

Peter [00:08:19] Yeah sure that's great. I'm glad you posted it that way because that's the way I'm careful to present it. And that's the way. In fact I need to present it to my faculty colleagues is that. Good instruction is not a shiny thing that comes with clickers are the tool are one tool you can use that sort of facilitate this.

Peter [00:08:42] Peer instruction instead is a particular. Active collaborative. Activity that you can run in your classroom. There's lots of things you're going to do in your class. You're going to you're going to lecture sometimes you're going to show video sometimes you're going to have a group activity where they have to answer some questions on a worksheet they're going to stand up and talk to each other they're going to look at posters on the wall.

Peter [00:09:04] There's all sorts of different possibilities and using peer instruction it's just another one of those tools it just so happens though that with peer instruction with effective peer instruction it is it is really versatile you can do so many different things with peer instruction.

Peter [00:09:23] In so many different fields that you know if you only had a chance if you only had the time and energy and opportunity to adopt one active learning method in your class I would totally advocate that you look at peer instruction.

Bonni [00:09:40] One of the blogs I read as I was researching for today's interview and I will put a link to this in the show notes by the way so people can access it talks about it really does make it seem so much less intimidating than other methods of instruction just to try it out.

Bonni [00:09:58] And one of the things you talk about is that peer instruction for us can just be a two minute pause away. Can you describe that for me that two minute pause I could start right now and get started with peer instruction.

Peter [00:10:12] Yeah we we the instructors we love to talk right. We stand at the front of the room. We could fill hours of telling people about our content and

that traditional lecture style you know student students don't learn as much from that students need to be actively involved.

Peter [00:10:31] This is the whole basis they need to be actively involved in the content they need to be engaged they need to be creating their own understanding based on their own misconceptions and previous knowledge and experience and skills and motivations and.

Peter [00:10:43] In the old days when your instructor used to say I can't learn this stuff for ya, okay maybe he was right. That's what the students need to do. They do need to be learning the material for themselves in the classroom. And you know so that means we need to make time for it.

Peter [00:11:01] We need to schedule time into the class. Where the students can stop and think and and start to learn. And if you can find some way to do it collaboratively even better a two minute pause is a great technique. Just stop stop talking for a little while and let the students stop and think in the 2 minute pause.

Peter [00:11:22] What you can say is take the next two minutes look back over your notes. If it's any questions talk to your neighbors see if you can figure out what question would fill in the hole and then at the end of a few minutes we'll come back and you can ask your questions and then we'll keep going with the class often.

Bonni [00:11:37] And you described it as a very broad and diverse instructional techniques so it could be more broad reflection but as you're saying it also could be a very pinpointed planned question around a topic where you know students often have trouble.

Peter [00:11:54] The idea is that. Every 10 or 15 minutes or so when students brains are full the instructor just needs to stop talking for a while and pose conceptually challenging multiple choice question it's conceptually challenging because I want to make the brain hurt a little bit.

Peter [00:12:13] And I'm not making your brain work then I'm not teaching hard enough and it's concept and it's multiple choice. Well that's really just the technology is that the clicker itself has some buttons on it and the colored card has a b c d.

Peter [00:12:27] But I've got friends who do this with think pair share and instead of clicking you write something down on you write something down as you would think. But anyway conceptually challenging question. All right. Then each student in the class has to think about it on their own and individually commit to one of those answers.

Peter [00:12:47] The magic of peer instruction happens in a few minutes from now when the students teach each other the content and in order to have that conversation every student needs something to contribute to the conversation. And so that's why those sort of first solo vote they would call it in the peer instruction community.

Peter [00:13:03] That time when you click on your own. That's critical. If you talk right away and then you just click what your friend Click. You only have to think about on your own. Just listen to that guy who always seems to get the answer right or something.

Peter [00:13:16] So that's the first step as the solo vote where you commit yourself than the instructor looks at the results. Iclicker technology and the other the turning point as well. You have an opportunity to look at the data. And just get an idea of what's happening out there in the classroom. And so the instructor says oh that's really interesting.

Peter [00:13:36] You know I thought this. You're not agreeing with at all on this question. And so he sort of wants to go I don't want to just turn to your neighbor toward your neighbors or through people around you. Convince your neighbor you've got the right answer. Or if you've got the same answer just check you about it for the right reasons or whichever one of these options you picked.

Peter [00:13:53] You know give the evidence from the textbook for it. And one of the things that should happen there are one of the things that should not happen there is showing it certainly with iclicker you can show a graph of the outcome of the vote. You just put the histogram on the screen.

Peter [00:14:09] And once students see that histogram you might be in trouble because they'll do whatever they can to convince each other that the biggest stick on the histogram is the right answer even if it's not. So I'd say that don't them the histogram the first time. They don't need to. You know what it is awesome.

Peter [00:14:24] All right so then so you tell your friends convince yourselves convince your neighbors. Right. And then the room should get really loud. This is their opportunity to practice thinking and talking like an expert and the instructor wander around circulate listen into things because you'll hear things that you never would have imagined. Well of course not because you're the expert.

Peter [00:14:45] You don't think that way or if you did it was 20 years ago when you thought that way. So listen and don't be direct just yet. You know you'll have a chance to talk to them later. Let them talk listen for interesting things make some notes for yourself.

Peter [00:14:58] By the way that that group back there in the corner they had exactly the right thing I wanted to hear. Even though it's not wrong I'm going to call them. I'm going to call on them later. Yes that's good. OK. Listen around. All right. When it looks like the conversation started to die then you say excellent let's vote again.

Peter [00:15:13] Vote again on the same question and then vote again. Certainly on one of these questions that has a right answer. You vote a second time often and then based on the second vote. Well hopefully hopefully they taught each other and hopefully there's a shift towards the right answer.

Peter [00:15:28] And even if there is a good shift you're not done just yet. They've had a chance to try thinking about the content and talking about it. So they've had a little bit of practice. Now you need to get this sort of class wide discussion going.

Peter [00:15:41] You need to draw out their thinking about all the options that you presented the right ones and the wrong ones. You can say things like you know everybody realized that that is the right answer. Good. So just somebody remind me why he's the right answer.

Peter [00:15:55] That's right. OK good. So you get the student to give it and then you say nobody ever picked B which is good because it's the wrong answer. Someone explain to me why B is wrong. What did your group say. And again to take the time they've been thinking about this thing hard for the last five minutes.

Peter [00:16:09] Milk every last bit of learning and discussion you can out of that question. So then you have a class discussion and at the end of it the instructor

will confirm what the right answer is Maybe. Model how an expert would solve that problem or the kind of analysis an expert would do.

Peter [00:16:26] And then you're ready to move on with the rest to go with the rest of your presentation and that that episode of peer instruction as we'd say it might take five minutes. It might take a little longer depending on the kind of question you ask but that's what we should do with peer instruction every 10 or 15 or 20 minutes. You insert this little 6 to 8 minutes of students entered active thinking and learning.

Bonni [00:16:48] What can you tell us broadly about what you have found make good peer instruction questions and which ones are tend to be less ideal ones.

Peter [00:16:57] Excellent question Bonni. That's exactly the question that I will get from faculty and from instructors who are thinking about peer instruction. When you see your instructor actually when you see clickers people immediately say and jump through this is a multiple choice question.

Peter [00:17:12] And there's no way they say there's no way we can take something as complex and deep as my discipline and turn it into a multiple choice and therefore I'm not going to use clicker. It's too superficial. All right so that's a common that's a common misconception about peer instruction is that it's just multiple choice questions that test the recall.

Peter [00:17:35] You can do that. It's true that those are not very interesting questions. So instead I want to I want to pose a question that makes the students stop and think the way an expert thinks. Now sometimes that means I'm going to ask a question we're going to pose a question where there's where I'm going.

Peter [00:17:55] It's going to look like multiple choice and one of the answers is the correct answer. We see this more often in the STEM fields you know in certain physics problems or certain math problems that there is a right answer by the way that the string will be pulled by the amount of force or the object will move to the left or the or the answer really is X squared that nothing we can do about that.

Peter [00:18:15] And so there are questions like that. But we just kind of make sure that they're not something you could just Google. If I can just asked Siri to answer this question for me that's not good enough that's not a good use of my class time.

Peter [00:18:27] And if it's something that's going to require a 10 minute calculation before I get the answer is pi by 4 Yeah that's not such a good question either because it's hard for me to collaborate with my friends. All right so we want to find questions that probe the deeper concepts probe the background concept and in a question like that we want to make sure that some of that distractors that is the incorrect answers.

Peter [00:18:50] Every choice I put up on the board or on the slide I want to be able to diagnose. Something about my students thinking by how they answer. In other words if they get the answer right there is the right answer and they pick it. I want to know they picked it for the right reason and if they pick one of my answers it's incorrect.

Peter [00:19:08] As much as possible I want to be able to say I know why you picked B. It's because of that misconception that I know about because I did the literature search or I've ran across it myself or a few pick c. That's because you're thinking about last week not this week.

Peter [00:19:22] Seven questions with one correct answer. You can go a lot deeper. What I've learned most from my colleagues in the arts and humanities is a whole different style of peer instruction question where the goal is not to test your knowledge.

Peter [00:19:37] The goal is to make you practice sounding like a historian for example. And the way they do it is they say here's an interesting thing. There's an interesting concept and then they pose this question and every single one of the answers is correct.

Peter [00:19:53] They're just slightly different interpretations or they're all correct they're all different components of this big central concept central event and the pure instruction question essentially is here's five things that we were talking about that I want you to talk about. Pick one.

Peter [00:20:07] Pick one to tell your friends about it. And by the way do your best to support that thesis or that idea try to support it with the readings from the book. And so there's not a right answer. Every answer is correct. And what it does is it makes every students sound like a historian or a linguist or a psychologist or whatever the field happens to be.

Peter [00:20:27] It makes them sound like one of those kinds of experts for a little while. That's not something you can google because there is no right answer. Instead it's just take this opportunity to think in more expert like ways.

Bonni [00:20:38] I found another really difficult transition for students to make and as I've actually happened upon this before knowing there was a name for doing this and also happened upon it without really realizing that our students in many cases have been really conditioned that there are right or wrong answers to things.

Bonni [00:20:56] And it can be quite uncomfortable for them to experience this for the first time. Do you have any advice for how to introduce the ideas that there may not be an absolutely right answer to every question?

Peter [00:21:10] Peer instruction what it when it's done well it's not easy. I go to class and this instructor makes me think like think - unlike in my other class where I could just sit there and take some notes or just listen.

Peter [00:21:25] We need the students to participate. We need to make them realize this is a valuable exercise. I mean occasionally some participation marks are something that helps on that too we need them to want to participate.

Peter [00:21:40] And that means removing as many barriers as we possibly can like making it to high stakes. If there is a correct answer and you get lots of grades for getting it right and you don't get any marks for getting it wrong. Okay that's that's too high barrier. People are not going to participate or are they just going to copy that. Like the smart guy who likes to be over there or something. We also have to convince them that in this activity here in the class today this is not about getting the right answer. This is about practicing how to think and everybody can do that everybody should do that. And that's what I'm interested in helping you with this today is the process and what you're actually where you got the answer right or not I don't care.

Peter [00:22:20] We'll have a homework question later to test your content knowledge. So we need to convince the students that this is sort of an experimental stage that everybody is welcome to think about some and maybe get it wrong. But doesn't matter.

Peter [00:22:34] But the important part is you know think about something. Commit to some kind of an answer and then practice talking to your friends

about it. It's really low stakes. You just talk to the person beside you and you don't have to tell anybody else.

Peter [00:22:45] And then you vote a couple of times maybe with your clicker and the instructor will see how the class voted but the instructor is not going to know how you individually voted. Not right there in class. So creating that atmosphere where the students feel free to experiment with their thinking that's really important.

Bonni [00:23:05] You linked in another one of your posts too. And you talk about a book called How People Learn. And it states and you're quoting from it that "experts must number one have a deep foundation of factual knowledge but that we don't stop there. Number two they need to. Experts need to be able to understand those facts and concepts in a conceptual framework.

Bonni [00:23:27] And then number three be able to organize the knowledge in ways that facilitate retrieval and application." And since we're only auditory today on the podcast I notice the difficult task to ask you to do but can you walk me through those visuals that show the difference between what the image looks like when I only have actual knowledge and then what the image looks like when I have a conceptual framework I'm building.

Bonni [00:23:53] And then what that image looks like when I'm actually able to facilitate that retrieval and being able to apply what I've learned.

Peter [00:24:02] Right. I mean yes I've got the image in my head.

Bonni [00:24:06] There's some jellybeans.

Peter [00:24:08] Even got it on my screen in front of me so I know exactly what we're talking about. All right so let me let me give the motivation for that picture in the first place. Certainly that's how people learn. If you haven't had a chance to go read how people learn I recommend everybody go do that. It's FREE.

Peter [00:24:23] Go download it. Read chapter one and then keep going. There's so much teaching and learning goodness wrapped up in that book. That's one recommendation. We'll find out about how people learn.

Bonni [00:24:32] I will link to it on the show notes and it's cracking me up because as I was researching I missed that big point of it being free so that's even better. That's great.

Peter [00:24:40] Even better. Exactly. All right so here's the motivation for that. That's sort of that picture and how I see this as you say all the content in a conceptual framework comes from my colleagues in physics. I'm not totally responsible for this particular analogy.

Peter [00:24:55] But everybody every freshman physics course has these awful terrible like inclined plane a cart is rolling down an inclined plane and the angle of the plane or the angle of the ramp is this and the car starts here and how far does the car go and what's the collision of friction and I mean it. Those are like nobody.

Peter [00:25:18] Ok let's see. Nobody likes those questions. That's the worst kind of physics class and we have to answer those kinds of things. I know they're important everything but when people see that inclined plane with a cart nobody smiles.

Peter [00:25:30] Most people just cringe. All right so here's what the student does. The student looks at that thing and says OK I did three of those in my homework last week so let me see what I did and we did that one in class and now I get another angle and I got another the of staying and momentum and there are some wheels and what's the answer and how do you tangent or do I need co-sign.

Peter [00:25:47] And you're just immediately overwhelmed with a million little bits of factual knowledge and you don't even know where to start. The expert though who's been doing this for a long time looks at that thing and says Oh it's one of those conservation of energy problems Yep. I'll do it this way.

Peter [00:26:07] And so the expert has the same content but it's organized instead of instead of having to flip through index cards in your head about inclined planes. No this is trajectories. No this is incline notice a trigonometry notes calculus this is not the expert says conservation of energy.

Peter [00:26:25] Maybe tomorrow will do a conservation of momentum problem or something they have a whole other branch of physics so the expert knows how to. The expert has the content organized and can quickly identify how to solve this problem and then has had so much practice that they can carry out that calculation or that analysis really quickly.

Peter [00:26:45] I think that's the difference between the novice and the expert. Not the novice an expert knowledges it's not just the content as my colleague Kimberly Tantor up in San Francisco she says anybody can memorize stuff that the knowledge itself given enough time anybody can memorize.

Peter [00:27:05] The expertise comes in how the knowledge is organized how different facts are related together and the expertise comes in how you are able to retrieve it. So that's the kind of thing I want to help my students build. Like we say anybody can memorize stuff here. Go read the textbook read it twice and I'll give you a multiple choice test on it or something.

Bonni [00:27:25] Even beyond that it isn't just looking at a a question that might show up on an exam that is some hypothetical but that students who have this and the experts who have this knowledge can go around and see opportunities in such a creative way that show up in their work and in their life.

Peter [00:27:47] One of the benefits of having this sort of rich network conceptual framework in your head is you can make inferences. You know the expert knows that that if this happens and that happens then I'm going to expect this thing to happen next.

Peter [00:28:02] And so I should go look for whereas the novice doesn't have that connection. They have thing. And they have the and I don't even know if they're related or not. So again I think that the more expert we are the say the more influence we can make the more predictions we can make and in any case the more we'll feed because we kind of can anticipate what should happen next.

Bonni [00:28:25] Well this is the point in the show in which we talk about our recommendations and I'll just mention real quick that my recommendation is I'm a big believer in visual note taking and during this past week I found a great set of tools from a website called showwithmedia.com.

Bonni [00:28:41] They have an entire section of their site. Oh and this is actually Wesley fryer which in my memory wasn't banks. He's more of a K through 12 expert but I certainly find a lot of benefit from his resources on the web. He's got a number of sites where he gives things.

Bonni [00:28:57] But he has got a wonderful page here with everything from terrific examples of visual note taking. And then a workflow of how if you were going to incorporate this either as a learner or as a facilitator of learning.

Bonni [00:29:10] And then all the tools that are out there for drawing and painting Whiteboard Animation concept mapping a whole bunch of both for windows or PC or web based tools and so it's worth the click to go check out.

Bonni [00:29:23] The show notes by the way or at teachinginhighered.com/53 for this episode so if that sounds like a good resource for you you'll want to check that one out. And I will pass the floor back to you. Peter what are your recommendations or recommendation for people listening today.

Peter [00:29:39] As I spend more time teaching about teaching the importance of not content I mean content is important. Sure. But anybody can memorize content right. I am learning so much more and appreciating that learning community. But you need to be a part of that.

Peter [00:29:56] We need learning communities in our classrooms your classroom should be a learning community. It might have 20 students in it or might have 300 students but they need to know that when they go there. This is an opportunity to learn together. A community of learners like that for educators is just as important.

Peter [00:30:13] We need people like us and people not like us and we need access to them. Lots of the time it's really hard to teach and teach effectively when you're by yourself sitting in an office with nobody else interested in what you're doing. Nobody to bounce ideas off of. All right so.

Peter [00:30:31] Get yourself into a learning community. Maybe there's one on your campus already but if there's not then here's my biggest recommendation Bonni is get on Twitter. Yeah I know Twitter's got a bad misconception. Something kind of bad misconceptions about clickers but no Twitter is this amazing 24 hour resource full of really smart people who can answer your questions.

Peter [00:30:57] And make you confront your misunderstandings and your misconceptions. There's so so when I talk to my students about Twitter what why should I learn Twitter in the classroom is part. I've seen some people try to do it and it's pretty hard to do Twitter between the instructors. You should get on Twitter and find a community of people like you.

Peter [00:31:19] Often it's by discipline. There's huge communities of physicists and astronomers and historians and you name it. And then of those people

you're going to find the ones that are also interested in teaching for example there's a bunch of people.

Peter [00:31:31] There's not a ton of us who are part of a real tight peer instruction community. But we're there. So if you're on Twitter look for hash tag peer instruction and start mining it and. So like I said there's these people out there.

Peter [00:31:45] I mean I sit in my office I'm sitting in my office by myself right now there's a couple of people next door but I'm in constant contact with dozens of people who I can bounce ideas off of who can run things past. And so certainly I've learned a lot about teaching and I've learned a lot about peer instruction. But what Twitter has introduced to me and this is the learning community part is all of the things I didn't know about that had the opportunity to learn because of them.

Peter [00:32:07] I mean I'm I don't want to get too far off topic Bonni but here I am I'm a middle aged white man in a science department originally. I thought everything was just great and the people I talked to were middle aged white males as well because that's who was in my department with me.

Peter [00:32:24] I didn't notice the lack of women for example I didn't notice that there weren't very many minority people around my departments because well one there weren't and 2 I didn't even know I was with the gas. That kind of thing.

Peter [00:32:39] So this is what I've learned so much about from this community of people on Twitter as I am now so much more aware of diversity of privilege the struggles that minorities go through to be part of higher education. And I wouldn't have found any of that if I just sat alone in my office or if I hung out with my old colleagues who were all sort of like me.

Peter [00:33:02] If you want to do something to make you a better teacher better instructor then get on there get on Twitter. Start looking around and find out and you'll find people just like you and people that are not like you and those are just as important.

Bonni [00:33:18] Oh thank you so much what a wonderful invitation. And I will be linking to your Twitter username. So if people want to connect with you they can. And also sending up your list because you have a wonderful list you've curated of teaching and learning centers. I believe it's across the U.S. what it appears to be to me.

Bonni [00:33:37] But I have been subscribing to that for some time and have found that to be a useful list to find people who are more like me that are interested in faculty development. But as you said I have also found a lot of people on Twitter that challenge my thinking and they're broadening my ability to think critically about the world in which we live. So what a wonderful invitation. Thank you so much.

Peter [00:33:57] It's a part of my workflow it's a part of my workday. I check my email. I check my twitter. I learn from the web I learned from Google archived and Google Scholar. I learned from Twitter it's just part of my everyday work now. It's just another resource that I turned to.

Bonni [00:34:10] Well and thank you so much for responding to my invitation to be on the show and for coming on and sharing about peer instruction and I'll look forward to passing on any comments we get from listeners and just to continuing the dialogue from here and really appreciate your acceptance of the invitation.

Peter [00:34:27] Thank you Bonni I have a really good time and not to say anything that's on my blog I'm happy to share it with anybody. Follow me on Twitter and I'm happy to answer questions that come up to you or to anybody online.

Bonni [00:34:40] Thanks once again to Peter for being the guest on episode 53 of Teaching in Higher Ed.

Bonni [00:34:47] If you'd like to comment on today's episode. You can do so at teachinginhighered.com/53. And as always if you haven't yet subscribe to the weekly updates you'll receive one email a week with a combined. Email of all the links that Peter and I talked about as well as a article on teaching or productivity and would love to have you do that at teachinginhighered.com/subscribe. And any feedback you have for future guests or topics are always welcome at teachinginhighered.com/feedback. Thanks again for listening and I'll see you next time.

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