

Ep. 040: Prior Knowledge

Students' prior knowledge-- what they bring to the classroom from their other learning experiences-- can be the proverbial double-edged sword. This week, Claire and Jim dive into the book *How Learning Works* and the first of the seven research-based principles it describes. Learn why "knowing" is not enough, and how we as teachers need to activate the knowledge students bring with them before we can build upon it. We also discuss the perils of situations when students' prior knowledge is inaccurate, and why it's important for teachers to identify what knowledge is important for our particular learning environment (think "grammar"). Plus, we discuss strategies for helping a handful of students "catch up" without boring the rest of the class!

Podcast: <https://prodev.illinoisstate.edu/podcast/2018/ep040.shtml>

Transcript

JIM: Hi there. I'm Jim.

CLAIRE: And I'm Claire.

JIM: Let's Talk Teaching

JIM: Welcome to Let's Talk Teaching, a podcast from the Center for Teaching, Learning and Technology here at Illinois State University. I'm Jim Gee. Joining me today, our director, Dr. Claire Lamonica. Happy New Year, Claire.

CLAIRE: Thank you. Happy New Year to you, Jim.

JIM: People may be hearing this in February. So that may be a little bit later.

CLAIRE: It's getting pretty old at this point.

JIM: You know I'm, well, we're recording this like uh-

CLAIRE: I'm kind of over this year.

JIM: So early? No, I don't think so at all. Cuz I mean, I was looking, it's like, we're already you know, the semester is already started when we're recording this where it's around January 18, I think is the day that we're recording it. And I looked at the calendar, like what happened, like, you know, we are looking forward to the new year, even though it seems to be speeding along like a freight train already. Because with our new season of podcasts that we're producing, we wanted to revisit or actually visit kind of in depth for the first time, one of our most looked to most used books, here at CTLT. Tell us about it?

CLAIRE: Well, I what I'm hoping that we'll do this semester, is take a look at a book called How Learning Works. Seven research-based principles for smart teaching.

JIM: And of course, here we have another seven, we were talking about this before we started recording, we have another seven best practices or principles that we're looking at.

CLAIRE: Right. Because we did you know, seven good practices for undergraduate. Yeah, Seven Principles for Good Practice in Undergraduate Education. And now we're doing seven research-based principles for smart teaching. So, yeah, set the number seven seems to come up a lot. But it's, you know, it's mostly a lucky number. I think so.

JIM: I guess. Yeah. And this book, in particular approaches teaching a little bit differently than than the previous seven principles that we were talking about.

CLAIRE: Right, you know, like the other book are, the other one is actually kind of a monograph. Yeah, this one is, it is research-based. Um, the thing I like about this is it's much more explicit; it doesn't just have sort of a gigantic bibliography at the end, sort of listing all the research there like that, it's much more explicit in terms of identifying and bringing together the, the research throughout. It has, it has a pretty clear structure; each chapter is structured in the same way. It was written, it's a collaborative work, it was written by five people kind of working in the field of professional development for faculty. It's very user-friendly. Each chapter starts with each chapter takes one principle; it starts with a couple of sort of case studies. You know, this happened in this classroom, and this happened in this classroom, what's going on here, then it identifies the principle, then it really pulls that principle apart and looks at the research behind the principle. And then - and I think this is faculty's favorite part, it has a maybe it's just my favorite part, but it has strategies. So how do you apply this principle in your classroom? What does this mean for your teaching and for your students learning, and its very classroom-friendly sort of ideas, things you can do to activate student learning.

JIM: Right, exactly. And so, I think it's those strategies that we are helping guide faculty members towards using so I think, probably as we kind of talked before we started recording today is the strategies that will ultimately end up focusing on quite a lot. And there are a lot of different types. So, there's a lot to unpack from this,

CLAIRE: there's a lot to unpack. It's it's, pretty dense, it's very, it's it's very user friendly, not just in terms of the the repeated structure, but also very accessible language, you don't have to be an expert in teaching or learning to, you know, to read this not it's not loaded with jargon, and so on and so forth.

JIM: And I think that the topic that we want to talk about today, in particular, the principle we want to focus on, is also kind of a good introductory sort of topic, as we kind of dive into this book over the course of the next several episodes, and throughout the year; because we're talking about this thing that we've talked about a lot before, which is prior knowledge and assessing students prior knowledge. And that's something that I think is easy for teachers to wrap their brains around as far as what it is. Getting past

some of our own assumptions, as I'm sure we're going to talk about may not be quite as easy,

CLAIRE: right? Right. So the actual principle is You know, principle number one, students prior knowledge can help or hinder learning. And I think that that's something that anybody who's been in the classroom for a while has sort of figured out, I think you might come into a, into a teaching career thinking, Oh, prior knowledge, that's a good thing. They, if they already know stuff, then you know, and even assuming that students will know stuff, and then you learn pretty quickly that sometimes it's a bad thing.

JIM: So give us an example of that.

CLAIRE: Okay, so prior knowledge, so alright, so I think I've talked before about this thing I used to do to assess students prior knowledge about writing. So, in a first-year composition course, first day of class, I would ask, I would give students an assignment, make a list of 10 things you already know about good writing. Okay. Some of those things, were really helpful prior knowledge. So, when a student said, writing is a painful and messy process, you know, that, that actually, I liked it when I saw that not so much when I saw good writing always has five paragraphs. Well, that was that was prior, and that could be very deeply ingrained idea that they had been that they really had been had had reinforced over many, many years of writing instruction.

JIM: Right.

CLAIRE: So even uncovering that kind of prior knowledge that hinders their learning or could potentially hinder their learning from it from a teaching standpoint, that empowers us to do something.

CLAIRE: So, you know, when I saw that, um, you know, that was not quite as encouraging. Yeah, a little discouraging. Sure. But the good thing is that, then I knew that that was out there, right? Because I had strategies for addressing that. Or that misconception. So, I just, you know, I just needed to know that I needed to implement them.

CLAIRE: Right. Right. Yeah. I mean, once I know that they're thinking that, that, you know, without having to wait till I get their first paper and see, oh, it has five paragraphs. Is that in- did they do that on purpose? Or did they just happen to have five, you know, paragraphs worth of stuff to say? Or, you know, what, whatever. So yeah,

JIM: So, my introduction into this idea of prior knowledge was, you know, when I first started teaching, on the university level, I was I was a practitioner who was brought in, you know, as a professional from from from an industry that was brought in to teach. And I had no idea what I was doing. And, and no one really seemed to care about that. They just kind of let me go and, you know, good luck. And so, I did that. And what I discovered was the first assessment, I would give the first big test I would give them, you know, they they did awfully.

CLAIRE: Yeah, they would bomb.

JIM: Yeah, they would bomb on it. So, I kind of came to prior knowledge from kind of backwards. Originally, I wasn't assessing their prior knowledge, but I realized suddenly that there was something that was affecting their their ability to do well on this test. Now, there are probably a lot of factors here, including how the test was designed, and all that other stuff, which is, as we like to say, yeah, right, which is, as we like to say, another episode. But what I realized was that it was also an issue prior knowledge, I was assuming that they knew things about in this case journalism, or broadcast journalism, or even just how the world worked. That was that was confounding them. So, let's, let's kind of transition into some of the strategies we want to talk about, how do we actually know that we're doing a good job assessing their prior knowledge?

CLAIRE: Okay, so I think what we I think, before we even do that, we want to sort of back up a little bit. Okay, I'm gonna back up. And I'm going to, I want to talk for just a minute. Yeah. Very Nevada. It's actually a pretty good imitation.

JIM: We've had a sound effect. Yeah, I'm turning into the Mel Blanc of podcasting. I, you know.

CLAIRE: I want to talk a little bit about when prior knowledge does help, and when it doesn't help, because what, because the research has actually uncovered specific circumstances under which prior knowledge is helpful or when it's not. Okay. So prior knowledge is helpful when A) students have activated it. So they're actually using it. Okay. There might be stuff in their heads that they know, but they're just not drawing on it. That happens all the time, by the way. Yeah, a whole lot. Yeah. And we say, Oh, they were supposed to learn this in that prior class. Well, yeah, maybe they did. But they don't, you know, they haven't figured out that they need to use it in this class. When it's sufficient. So that means they need to know enough. All right, to move on to whatever it is that you're asking them to move on to when it's appropriate. So, some things we know might be appropriate in some situations, but not others. But because we know it, we think, oh, well I need to apply that in every situation I encountered. You know, it's not always not everything we know is applicable to every situation. So, it's like I used to say, you know, raising three kids, the only thing I learned, was it nothing I learned raising the first one was applicable to the second one, I think I learned, you know, from the second one was applicable to the third one.

JIM: Well, I need to go to your back to your original example about, you know, the five-paragraph writing structure, there are times when that may be appropriate, but not in every case, not a universal rule.

CLAIRE: Not general, not generally. Um, and, and, of course, you know, this almost seems like a given, but prior knowledge is only helpful if it's accurate. And so sometimes they've half learned something and haven't quite learned something, or they just learned it wrong. Yeah. And you know, and that means, you know, that's not helpful. So that's one of the first times when it's not helpful is when it's inaccurate. Right. Okay. It's also not helpful if they're not calling on it, okay, that it's in there, but they're not, they're not calling it up. When they don't know enough, okay, or when it's inappropriate. So, sort of the flip side of all the times when we all the circumstances under which it was appropriate. What when it does help learning, it doesn't help learning if the

circumstances are reversed. Sure. So, so that's sort of, that's kind of the general overview.

JIM: So how do we how do we, how do we act on that? How do we act on it? How do we how do we actually know that we're getting it? How do we know that that that is what is right? How do we assess it?

CLAIRE: So what, well are how do we just how do we implement it, so it's not always a matter of assessing, it's just a matter of, you know, putting it into practice? You know, so, so using it in our classrooms, right? So and, and what we basically want to do, so the big thing we want to do is take those kinds of prior net knowledge that hinder learning, and flip them, so that because they become the kinds of prior knowledge that help learning, okay, so, for example, when prior knowledge is inactive, that hinders learning. When it's active, when it's been activated. It helps learning, we want to find ways to activate their prior knowledge. So we've talked about this before, too, we've talked about what people in education call the anticipatory set, which is something you do it's other people call it the hook, it's the thing you do at the start of class that sort of brings them all together and gets their brains in the right place to learn what it is that they want them to learn that day. Okay. So, you might, for example, do what I did in the right guy, just have them think about what do you already know about this topic. And there's lots of ways to do that, you know, I had them make a list, you can have them do group brainstorming, you can have them do a little free writing, you can have them create a concept map. Um, that's kind of fun, you know, put the main idea for the day, you know, in the middle, and then say, hey, and they could do that individually, or you could do it collectively as a class. So, there's lots of ways to sort of turn inactive prior knowledge into active prior knowledge.

JIM: And I think you know, the one, okay, so going back to my my discovery of prior knowledge and whatnot. So the next step I did was, was not very effective, where I stood up, and I said, You know what, you all should already know X, Y, and Z. Who doesn't know it? Raise your hand? Well, that didn't work.

CLAIRE: No, no, of course not. Because they you know that nobody's gonna say they don't know exactly. No, there's there's hardly any hardly ever any pedagogical advantage to excoriating your students. Exactly. Just that's No, I understood that for the day. Or are, you know, publicly shaming or asking them to publicly shame themselves?

JIM: You put it very nicely in one of our early podcasts where you said, essentially, and I'm paraphrasing here, the stocks went out of style a long time. No, and I agree, and so and, and, but I think it is something that we, you know, the flip side of that is that we do need to recognize that as we're asking students to think about this, that when they when they realize that maybe they that they're- where their prior knowledge lies, right, that that may, there may be an emotional aspect of that, that they have to deal with. I-

CLAIRE: Sure, yeah.

JIM: So, we talked before we begin recording, I talked about how, you know, I had assumed a lot of prior knowledge based on students majors and I and I didn't realize I had a student in the class who wasn't actually major in the in the department. He was taking it as a minor. And so, his experiences were different and he was brave enough to put up and say, You know what, I actually never talked about that in any classes. I'd like to learn more. Yeah. And I'm like, okay, great. And we can talk at other times about how do you how do you supplement individual students? You know, and that-

CLAIRE: Yeah, because you know, that's really the most that for me, when I look at this list, that's probably the most confounding thing is, and I think that's what we hear about over and over again, from people who say, you know, my students should know this. Yeah. You know, they should have learned this in X class, they should have learned this in third grade, you know, and sometimes it's, they do know it, it just hasn't been activated. Right. So they have an activate. So that's like, you know, punctuation, they should know, to put a period at the end of every sentence? Well, of course, they do. They do know that they did, but they didn't realize that you cared, yeah, so yeah, you know, let them know, you care, that they need to activate that prior knowledge. But I think this idea of when they don't, when their prior knowledge is insufficient, that's really confounding to us, partly because that insufficiency may vary from student to student, right. So, you know, some students will actually remember more from a previous course, or they will have learned it better. So, you know, or, for whatever reason, so you can have students at different levels if you have, so I, when we were talking earlier, I told the story about the time that I went to teach in an upper level, well, sort of medium level writing class. And I started the class with the assumption that all of my students would have taken courses in which they compiled writing portfolios before. And so, I went in ready to sort of hit the ground running, I wasn't gonna, I didn't plan to spend any time talking about, you know, the concept of the writing portfolio, what it was what I, you know, my expectations, Buzz, wrong! A whole bunch of them had had never even heard of the concept of a writing portfolio. So, I had to, you know, that was okay, it was a, it was a, well, most of them, almost all of them. And so, I had to sort of go back and rethink my approach to what I was doing, and particularly early in the semester. So and it was, you know, mostly, it was a matter of logistics, like, don't just save your new drafts over your old drafts, you know, a separate, give it a new name, whatever, because you want to be able to see growth and development and blah, blah, blah, that was probably a pretty easy place to be, the harder place to be is when you're assuming that all of your students know how to, you know, know what mean, median, and mode are, right? And all but three of them do, you know, you got a 20-student class, and you've got three students who don't know me, median and mode. And now, you know, what am I going to do with those three students?

JIM: And, and you're right, that is a that is something that we encounter a lot here at CTLT. That's, you know, in the consultations that we do a future episode that we hope to produce of our humble pokey little podcast here is about welcoming office hours. And, and doing that, and I think, you know, some of the some of the teachers I've worked with some of the faculty members I've worked with, where this has come up, they have successfully use strategies like having, you know, like having group office hours and whatnot, where, you know, you're not singling out individuals, but you're at least

welcoming them inviting them, you help them realize what they don't know. And then you invite them in, outside of the class, because the other part of it is, I don't want to have to, as horrible as it is to use this phrase, teach to the lowest common denominator, or I don't want to put the brakes on everything.

CLAIRE: Right, you don't want to put the brakes on really, you don't want to have to use class time for that, you know; you could this is a situation where if this is something that comes over comes up over and over again, you know, you know that you know that every semester, you're going to have those two or three students can't remember, you know, don't know what Mean, Median mode, or you could create a quick little podcast or video chest doesn't mean medium of video lesson, digital lesson, stick it into Reggie net. Yeah. And then tell students, hey, if you can't remember the difference between medium mode, or if you've never heard of these before, access this lesson, take a little quiz, you know, do what I show, you know, whatever.

JIM: And there may be something there may be something that already exists out there that you could just get them to.

CLAIRE: I bet you can just click to a link of Yeah, Khan Academy.

JIM: Well, you know, a good example of that was when I when I came back to get a graduate degree. One of the first classes I took on rhetoric was the instructor had a little pamphlet that was like, you know, introduction to rhetorical terms. And it talked about Aristotle and it talked a little bit about it had some other stuff in there too, but and rhetorical criticism a little bit. But it was just a primitive because, because it was a big tent. And we had a lot of students from a lot of different disciplines coming in to actually to actually explore this, these topics, and that was one way to supplement that. We could use it or not. Yeah, but it was a good reference to have. So even just giving them reference, I think it's important. So going back to the strategies, and whatnot, what else? What other strategies do you think that we should have in our, in our toolbox?

CLAIRE: In our toolbox? Yeah. So, we, let's see, we talked about some strategies for, for sort of accessing prior knowledge, or, you know, finding out what students already know, or don't know, we might want to spend just a second on activating prior knowledge. So, you're pretty sure they know it, but they're just they're not applying it. So, like that whole, you know, they're not putting periods at the ends of sentences. I mean, that's such a, you know, I don't, but it probably happens.

JIM: Well, we're not putting commas between two independent clauses joined by a conjunction,

CLAIRE: Yeah, you know, so something like that, that they know, you know, you can just explicitly set that expectation out there. Yeah. You know, so, um, hey, I, you know, in this class, I expect you to, you know, abide by the, you know, the conventions of written, you know, written communication. And if you need a review, here's a link to the Purdue right online writing laboratory, you know, whatever. So, um, or you can, you can ask questions that require them to use prior knowledge. So, think about

protagonist, you know, you could say, okay, so let's think about some protagonists who were the protagonist in some, you know, who is the protagonist in your favorite book.

JIM: So, when we're talking about applying prior knowledge, or activating I'm sorry, I'm talking about activating prior knowledge. One, one way to achieve that seems to be to apply it to the real world, or to you know, to make a connection to make to make those connections. That seems to be probably one of the best paths to take.

CLAIRE: Yeah, my, my five-year-old grandson is in kindergarten, and he recently learned that a period means stop. Ah, it's a stop sign. It's a stop sign. Yeah. And so, you know, now once we can get him past saying, stop every time he encounters a period, we're gonna be in great shape.

JIM: Oh, laughs.

CLAIRE: Oh, yeah, that real world analogy, even at five. Yeah, he knows that a stop sign means stop. Right. And so that teacher's analogy between the period and the stop sign. Yeah, you know, that was that was helpful that it struck, it struck a chord. Yeah. Um, it linked a new concept to something he already knew. Right? Um, you know, and now he's, he's sort of over applying that, but he's probably passed that by now. But you know, it's kind of a cute thing that he did, you know.

JIM: And it's, it's a shame, we no longer send telegrams to each other, because that could have been, you could have been the chosen one in terms of that. So, what else do we need to know?

CLAIRE: I think probably another hard thing is correcting inaccurate prior knowledge. So that you know that something, you know, I said, well, when a student comes in, says, all good writing has, you know, five paragraphs? Well, that's a pretty easy fix, you know, because I can say, hey, you know, I mean, I can say, go out and find me something published, write our art, look at these, look at these, you know, these are models of the kinds of things we're gonna write in this class, do these models, in fact, follow that format? You know, are they do they conform to that convention, which is, you know, tell them what you're going to tell them, tell them three things, you know, tell them the three things you told them. One of my children once called that the world's most boring way of writing. But you know, the thing is that there are very few, if any models of that in good, you couldn't go to an anthology of essays and find a five-paragraph theme, there's just no way. So, you can't even go to, well, I was gonna say, Time Magazine, but you can't really practically go to Time Magazine anymore. You know, you can go to Time Magazine, either online or in print, but, you know, there just aren't many places you can go where you're going to find that format. Yeah, that's not something that gets used in the real world. You know, that's a way to sort of, you know, under so you can start, you can start by undermining that. If it's a math class or a science class, you know, and they say, oh, of course, these two things have different speeds or whatever, and you're like, Okay, so, you know, ask them to justify their reasoning when they're, if they tell you something that's wrong, you can say, Okay, so

tell me more about that. You know, how did you reach that conclusion, right, you know, what kinds of evidence do you have for that, right? And so on and so forth. So.

JIM: Because I know the author's talk about helping students to identify the contradictions in their knowledge versus actual knowledge, like it's a phrase that they use. And then the other the other thing I remember they advise is that you have to give them multiple opportunities to do that. It's not necessarily just a one off.

CLAIRE: And time. And Khan Dane says mental models change slowly, you know, and I go back to that so often; it takes time, especially once, once there's an idea in your head. Changing that idea about anything is just, you know, a torturous process. Yeah, um, you know, it's hard for the teacher, it's hard for the learner. It's just, it's, it's slow. It's time consuming. It's frustrating. You know, it generates a certain amount of anger and angst. So yeah, learning is tough.

JIM: But but it's, but it's worth going through. Because when, when we're going through this process of dealing with prior knowledge and helping students identify where they're at themselves, then once you go through that process, it's a great feeling as a teacher to be able to say, Alright, guys, we got this. We can move on now. Yeah, yeah. Okay, we're ready. You're there. You're there. We've we've we've reached this goal. We've reached this plateau. Let's keep going up the mountain, that sort of thing.

CLAIRE: Yeah. Yeah.

JIM: Claire, thank you so much.

CLAIRE: Thank you, Jim.

JIM: And that's all the time we have for this week's episode of Let's Talk Teaching. You can find out more about the podcast by going to CTLT.IllinoisState.edu and clicking on the podcast link in the upper right of the page, For Dr. Claire Lamonica, and for all my colleagues here at the Center for Teaching, Learning and Technology, until we talk again, Happy Teaching!