Episode 11: Why Early Confusion Doesn't Mean You're Not Learning

[Theme Music]

Adam: Hi, I'm Adam Sanford. I'm an Academic Life Coach and professor in Los Angeles.

Dinur: And I'm Dinur Blum. I'm a college professor in Los Angeles.

Adam: And this is Learning Made Easier, a podcast where we discuss how we learn, and how we teach, and how they overlap.

Dinur: Welcome back to Learning Made Easier. This is Episode 11, "Why Early Confusion Doesn't Mean You're Not Learning."

Many students, when confronted with an unfamiliar topic, think their confusion means they're not smart or that they'll never learn something. In reality, this confusion is completely normal. In this episode, Adam and I discuss how early learning happens, and why early confusion actually shows that learning is happening.

Adam: So, Josh Kaufman studied the techniques of rapid skill acquisition, and we'll put a link to his book in the show notes. And he points out that although you need to spend about 10,000 hours on something to become a top-level expert, you really only need to spend about 20 focused hours on that thing to become reasonably competent at it. Now, those 20 hours need to be focused intelligent hours, they can't be haphazard.

For example, I'm currently going through duolingo to make myself learn Hebrew, and I can't do it unless I'm paying attention. So, I can't just sit there and look at it, I have to actually look at it. You see the difference?

And the thing is that if you can do those 20 hours, within about 20 focused intelligently-used hours, you can learn to play a musical instrument well enough to fake the current popular songs at a party. Or you can learn how to knit well enough to put together a blanket for your grandmother. Or you can learn how to play chess, maybe not well enough to be a Grand Master, but well enough to play at the tables in Central Park.

Or absorb enough of a new language that you can at least get by with native speakers so you'll be able to ask for things like, “Where's the bathroom?”

And another thing that Kaufman points out, and this is equally important is that you're going to be very confused when you try something new for the first time. And a lot of people, not just students, but we see it a lot with students, when they feel this initial confusion they assume that that confusion means they must be stupid, that they must be unable to learn. And so they pull away from the learning experience and give up - and there are those fixed-mindset folks from Carol Dweck’s work again.

Dinur: And one of the things that I think influences this, is that we only see people's “front stage.” We see their finished product as it is at that moment. We don't see the hours that went into practicing the missed notes, a skipped beat. If you're looking at sports, we don't see all the mistakes that were made that got a person from high school, to college, to the pros. We just see them as they are now and we assume that they've always been that successful and that skilled.

Adam: Right. And I was listening to a podcast just yesterday, actually - Brooke Castillo was interviewing one of her coaches who has a degree in positive psychology - and this coach said, “We tend to assume that the really talented people are the ones who are really successful.” But Carol Dweck’s earlier work, even before she did the work that we talked about with the second-graders, she looked at people who were incredibly talented, when they were like 5, 6, 7, whether it was with music, or with sports, or whatever. And by 15, or 16, they had burned out, because they were fixed mindset people thinking, “well, if I make any mistakes, then I'm not good at this anymore.”

And the fact is that the more complicated the work gets, the more likely it is that you will make some mistakes on the way. What you said about “we only see people's front stage,” one of the ways that I've heard it said is, “we look at everyone else's final cut, and don't realize that they all have a blooper reel. And we look at our own blooper reel, and we compare it to everybody else's final cut,” because we know what mistakes we made. But we don't know what mistakes the person sitting next to us in class or the person near us at the concert, we don't know what mistakes they made. We only know what mistakes we made, and we figured that since we only see our mistakes and we don't see their mistakes, then they must not be making any mistakes. And that's not true at all.

Dinur: Not at all, right.

Adam: So, when we get back to the confusion that we feel when we're first doing something new, and students, it's not just you. The first time I used a new teaching method, I was so out of my depth. I was like, “I hope I understand this, but I'm not sure I do. And wow, I really screwed up there, and I wonder if the students think I'm stupid now.” It happens to us too. But what they don't realize is that this level of confusion when you're first doing something new, that's completely normal. That's what happens

to everyone, no matter how talented they are, no matter how skilled they are. Doing something that you've never done before? You're going to be confused.

Dinur: I make a lot of sports analogies on this podcast so what's one more, right? What are a few more? But if you played sports, I want you to go back and think about when you first started. So, if you play baseball, the first time you tried hitting a pitch coming out of a pitcher's hand, you're probably swinging all over the place, you weren't having a lot of success. If you played football, you are trying to figure out where the defense is setting up or what the offense wants to do, depending on what part of the field you're playing. If you're playing basketball, same thing - you're trying to figure out, how do I get the ball into the basket?

And odds are, early on, it was pretty tough, you're swinging and missing at the ball, you weren't reading where players were going to be, and you made mistakes over and over and over again. But if you kept with it, if you stick with it, odds are at some point, you started hitting the ball more. Your passes started going to your actual teammates and not to the other team or to the ground. It's something that just kind of clicked over time for you.

Think of your brain as a giant muscle. When you first start something new athletically, you're training your muscles and it's tough. You're not going to do very well if you're looking at lifting weights, you're not going to lift a lot at once. But over time, that repetition, and that breaking through that confusion, helps make that activity becomes something routine or a force of habit to the point that it becomes almost automatic and you don't think about that early confusion.

Learning works exactly the same way. When you start to learn something, it's a little bit like riding a bicycle blindfolded in a dark room. You're going to hit every obstacle possible, you're going to feel frustrated, you're not going to know how to navigate this confusion. But over time, that blindfold becomes a little loose, light starts coming in and you start going, "Oh, I remember right around here is this obstacle, I better turn away." This confusion, as counterintuitive as it sounds means that you're actually learning. And if you don't feel stupid or confused, when you're learning something new, then you're not really learning it because it's just barely seeping in. It's just getting into the surface, but you're not really engaged with the material.

Adam: I know I keep referring back to Brooke Castillo, but in another podcast, she points out that making something routine takes time. When you first drove a car, you had to think about everything, you had to think about pushing the gas and hitting the brake. And if you were driving a stick shift, you had to think about hitting the clutch and you had to think about okay, I've got to use my blinker now in order to turn or signal that I'm going into the next lane. And why won't this guy move out of my blind spot? And everything was conscious, you had to think about every single step and it was very confusing. But over time, driving is something most people don't really think about, we do that on autopilot. So the goal is to get you to where learning becomes autopilot.

But at the beginning, it's never going to be autopilot. If it's a brand new topic that you've never seen before, you're going to be confused. I'll take the examples of the art major and the math major. So, an art major probably doesn't want to deal with math, unless they're doing like really, really serious graphic art. But if they're doing, say, landscape painting, they have no interest in that. Not a thing. But in order to get out of college, you still have to take that general ed math class, you've got to pass the math class. And so you're confronted with all these numbers, and you're going, “Oh, my God, I have no idea what I'm doing. And why do I have to do this anyway?”

Meanwhile, the math major has to take a class in art history in order to get out, because that's one of the required breadth classes. And they're sitting there going, “Why can't I go back to my calculus side? This is not making sense to me. I don't know what they want me to see. I don't understand why it matters that they use this brushstroke.”

The thing is, both of these people are feeling stupid and confused at first. Well, that's because this is brand new stuff. And it's not just they're used to it's not part of their major, it's not part of their interests. So of course, they're going to feel stupid and confused. But now let me help you reframe that confusion.

So, that confusion you're feeling - and by the way, the first six to eight hours is total confusion, there's just no way around it. That is one of the things that Kaufman found was that when he tried learning a ukulele so that he could play ukulele, he has a great TED talk about it. And for the first six to eight hours, he just felt so stupid. And then all of a sudden it clicked, but it was six to eight focused hours - you cannot skip those six to eight focused hours and here's why.

Think of your mind as like a living room. And it has bookshelves for the things you already know. So, the art major is going to have a ton of art books in their mental bookshelf, the math major is going to have a ton of books on math, they're going to have a ton of notebooks filled with different equations, all kinds of stuff that's related to math. But the art major has no bookshelves for math and the math major has no bookshelves for art. And that confusion is, when you're bringing in this new information, it has no place to go.

So, it's basically sitting on the floor of your mind, cluttering it up. And that is where your brain says, “Oh, we have no place to store this, we better build some bookshelves.” For the next six to eight hours of working on it, it's going to be building bookshelves. And then when it clicks, suddenly, that's because the brain says, “Look, we've got bookshelves, let's stick this stuff on the bookshelves.” But until those bookshelves are built, that floor of your mind is going to be strewn with all the new things you're learning, there's not going to be any order to it, there's not going to be any organization to it. And you're going to be going, “I know that I saw that equation, but I have no idea what it means.” And then it's sitting on the floor. And you have to sift through all these other things to find it because you don't have any organization yet.

So, when that confusion hits, and it will, then what I tell my students is, “tell yourself, this is like when I was first learning how to ride a bike, and I was a total klutz. Maybe a student wants to go run a half marathon. Well, the first time they ran, they probably got about three blocks. And then they threw up and fell down. But over time, by using and training those learning muscles of your brain, this is going to get easier.”

I ask my students when I'm telling them this, I say “Okay, how many of you are athletes?” Hands go up and I say “okay, so you” - and I'll pick a big burly guy - and I'll say, “How much do you bench?”

And he’ll say, “Oh, I bench 320.”

And I'll say, “Okay, how much did you bench when you started?”

And he'll say “Okay, I benched 90.”

And I say, “So, it took you about a week to get from 90 to 320, right?”

“No.”

And it comes out that it takes about two years to get from 90 to 320 even if you're a big ripped guy, okay. And I say, “why do you think learning would be any different? Was it hard when you were first lifting 90?”

“Oh, yeah. God, I hurt afterward.”

“Okay. Why do you think that it would be any different the first time that your brain encounters something heavy?”

“Oh, okay.”

So, when you are training those learning muscles in your brain by using them over time, this will get easier, but you can't rush it. You can't go from 90 to 320 benching in a week, you can't rush these eight hours of total confusion in a week either. You've got to give yourself some time for your brain to build some bookshelves. But when you feel confused, remember, lean into the first few hours of total confusion, trust the process, and recognize that the confusion is the first real step in the learning process. Don't let it discourage you. Lean into it.

Dinur: I know that both Adam and I have gone through this confusion both as students and as teachers. And Adam’s mentioned, trying the new teaching technique and the confusion he felt, and the doubts that came because of that. Not only have I gone through that, as an instructor, I remember going through it as an undergrad. So, I remember when I first started to write, my thoughts would be all over the place. They

weren't organized very well. It took me a long, long time to learn how to write even a basic thesis statement, something that I teach my students something to organize the thoughts and to keep you on track. But until I pass through that initial barrier of confusion, I was doing what a lot of students do, and that's writing down words like stream of consciousness and hoping that it made sense to the reader, not knowing how it would really come out of.

Adam: So, when I was a student, I was not a math person. I've mentioned my problems with math before, I was hoping to avoid math and then I had to take college algebra. And fortunately, the teacher that I was taking, I took this at community college, and the teacher that I was taking used the ALEKS system, which basically, it's kind of like Duolingo, but for math. And it says, all right, you've done this three weeks ago, can you still do it, do these kinds of equations, so that you keep getting repetitive practice and spaced repetition. And where you may forget a little bit and then you have to force yourself to remember and then it comes back stronger, and it strengthens your brain.

And I worked so hard in that class and when it finally began to click, I felt so relieved, because it was probably four or five weeks into a 15 week semester, and I was freaking out that I was going to fail this class, and then suddenly, it clicked. “I remember that, I remember that equation, I know how to do that equation, I've done it before.”

And that kind of helped me understand that okay, confusion does not mean I'm a failure, it just means I'm confused. I got a B-minus in that class and it is the grade I'm proudest of, in all of my undergrad. And I got plenty of A's in undergrad but that B-minus, I really had to work my tail off for that, I had to work through that confusion.

And I wish that Kaufman had written his book like 20 years earlier, because then I would have read it and not have been so stressed out about being so confused for as long as I was. That's part of the learning process. And I can't emphasize this enough, confusion and mistakes, that's normal. And so many people don't think it is. So, many people like Dinur and I were talking about, they think everybody else's final cut is their only cut, they don't realize how many bloopers got edited out.

Dinur: If you do anything long enough, you're going to learn to do it well, but you're also going to be confused as hell when you start, and you're going to make mistakes. That's the nature of life. We make mistakes, we learn, we grow from them. And I think one big area that hurts people is we hit that initial confusion and that frustration and we allow that to dominate and assume that that is who we are. We're always going to be confused, we're never going to understand something. And it's hard to see into the future. It's hard to go, “yeah, it's confusing now, but I know that if I keep at it, I'm going to understand something or I'm going to be able to do something.” But as long as you're focused, and I think the keyword that Adam pointed out is focused, that allows learning to happen, that allows growth and development to happen.

Adam: And while it's humbling, it's also empowering to know that this isn't going to be forever. And that, I think, is the other thing that it's really important to know: the confusion only lasts a little while. And once you've gotten to the point where you have put in those focused hours, it begins to click.

So, we should probably talk about how teachers and students can use this knowledge.

Dinur: Absolutely. And as teachers, one of the very first things that we need to do is we need to reassure our students that their confusion is completely normal, and that it's a good thing, because it shows that learning is happening. If learning is always easy, then there's something that's not sinking in. Because to really learn something, it demands effort, it demands energy, and it demands time. And part of the result of not having all that effort or that time initially is confusion.

Adam: And the second thing is that a lot of students - like, I will tell a student, you know, “your confusion is normal.”

And they'll say, “well, it feels like I'm stupid, it feels like I'm a failure, it feels like I'm dumb.”

So, feelings and facts are not the same thing, and it's really hard for some of us to realize that our feelings don't actually reflect what's going on. Feelings are not factual. They're just feelings. But they can often cloud our judgment of the situation, they can influence our judgment of the situation. If we normally think that we're not that bright, and then we reach confusion, we see that as kind of reinforcing the idea that we're not that bright. But the fact is, and this is another thing that Dweck’s early work showed; the students who weren't categorized as bright or talented, weren't burning out at 15, 16, 17 years old, because they knew that hard work is what you need, and they were more used to being confused.

And so remember, your feelings may be very powerful. But that doesn't mean that they're true. And the research has shown that you will be confused for the first six to eight hours. So, remember that and let the students remember that and tell them what hour are you at? I mean, I've said that to my students. I’m like “Hey, well, if just the time in class is the focused time, and we started focusing in week three, and we meet twice a week for an hour, when we're in week six, so we're in the sixth hour of total confusion. So in another couple of weeks, this should start clicking.” Okay? Use that. Tell them, you've spent this much time on this in class. If you were focused, you've gone through this many hours of your total confusion.

Dinur: And like Adam said, feelings can be very powerful, they can feel very real. But one thing you might want to do if you're feeling confused, if you're feeling frustrated, is take a step back and try and look at yourself objectively or pretend there's a robot that's being fed information about you. Is that robot going to really sit back and say this person stupid? It would not. What that robot might say is that you're trying to assimilate rather a

lot of data. But we promise, this confusion is normal. You're trying to make sense of something, it's new to you. You're growing as you're learning this. And I mean, there's the phrase growing pains for a reason. It's not always a smooth process at first. So, not only as teachers can we reassure our students that this confusion is normal and that learning is actually happening; one concrete way we can help our students see this is by giving them things like low stakes quizzes. One of the things that I'm learning to do with my intro class, is I'm learning to put in a series of five small quizzes, each of them is worth something like two or three percent of their overall grade. Which means that even one bad quiz doesn't really hurt the grade overall. It lets the students see where they're strong and where they're not. And it lets me as an instructor know, what do I need to really make sure to cover before the exam that might have this material.

Adam: Another technique we can use in the classroom that - I believe I got this from either kqed.org, or teachthought.org - is to ask about questions in a different way. Because we normally say, “Does anyone have any questions?” Well, the thing is, when we ask it that way, a lot of students think “I don't want to slow the class down. If I asked my question, then I'm going to slow everything down and I don't want to do that. I don't want to be the kid that everybody focuses on for five minutes, who is making everybody else go, “Oh, my God, I can't believe he didn't already get that” or “I can't believe she doesn't already know that,” and so they don't ask the questions.

But if you ask them, “What questions do you still have?” Or if you've gone over a few things, “What other questions do you have?” I say that a lot, what other questions do you have because I know you've got them. Admit that and acknowledge that questions are going to be there, that questions are normal, that it's okay to ask questions, and that you expect there to be questions. Because “does anyone have any questions” kind of sound dismissive, but “what questions do you have? What other questions have you got for me?” That totally changes the tone of the way it works in class, and students are more willing to share their questions.

I switched this way, this semester, and I was stunned at how many questions I'm now getting, that I never got before. Because students no longer feel intimidated by “Do you have questions?” It doesn't feel like “and if you do, then you must be wasting our time.” It's what questions do you have? I know there's going to be questions. And it totally changes the way that they take that in.

Now, let's talk to the students. Students, here are some ways that you can use this.

Dinur: Right. And the first note that Adam and I have for you all is persistence, resilience, the idea of sticking to something, that's a skill. It's not something innate. It's something that you can develop. And it's something that needs to be developed. Because whether you're talking about learning something at school, whether you're talking about something that you do for fun, whether you're talking about something at work; there are times that work is going to very much feel like work, and it's going to feel confusing. But it's up to you to be able to stick with the assignment to do something,

whether it's for a class, for a coach, for a teacher or for a boss. And we are trying to instill that resilience, we're trying to teach you how to persist. We want that confusion because we want to see you break through that confusion. We don't want that confusion because there's some conspiracy to call students stupid. We promise you, there isn't. We do want to see that you can stick with something and that you can try and fight your way through that confusion and hopefully, have that material or that new skill that we're teaching click with you and stay with you.

Adam: And we might even want to say, not fight your way through the confusion, but exercise your way through the confusion. Practice your way through the confusion. Because "fight" makes it seem like it's almost like it's adversarial. But if we say you're going to practice your way through this, it's just like saying to someone who is learning how to do a layup, okay, you're going to fight your way to the layup. Why not practice your way to the layup?

When I represent this as practice, a lot of students begin to understand, "okay, my mind can be confused just the way that my muscles were weak. But I can build up my muscles, that means I can build up my mind."

And the other thing what you said about persistence and resilience that we're developing a skill, that's another thing that the positive psychologist in Brooke Castillo's recent podcast said, is that that's another thing that Dweck found is that the kids who didn't have a fixed mindset had more grit. They had more resilience, they had more persistence.

I did my mid-semester survey this week, and I've had some students say, "I hate the fact that we're doing this repetitive work." But the repetitive work is your calisthenics. When you're doing the same kind of thing, applying the same principle or the same structure to new material, the same organizing principles to new material, that's so that you really get that organizing principle in your head. That you practice it, if you make a few mistakes, that's okay, we can correct them.

I've had two students want me to just totally get rid of the lab assignments. And I'm like, no, because that's your practice time. That's your building up your muscle time. And so another thing that you can do students is, you've got to understand, you cannot do this 20 hours in two stretches of 10 hours, it's not going to work. Because you've got to space out how much time you're spending.

And I would recommend spending no more than maybe an hour, tops, on any one topic before giving yourself a day. So, if you study your history class on Monday, study effectively for an hour and then don't study it again until Wednesday. Give your brain those 48 hours to build a bookshelf. And if you divide those up and you focus consistently, you will find that those 20 hours pass rapidly. And suddenly, you understand the Russian alphabet, or you understand the basics of your calculus class. Or you understand those three theories that were kicking your butt in your sociology

class, whatever they are. But you've got to take those hours focused and divide them up, space them out so that you can engage with the confusing material in an intelligent focused way. Not just a haphazard, “I'm going to look at the book today.”

“I'm going to read pages 13 through 22 and make good notes on that.” That's focused. I'm going to look at the book, that's not focused.

Dinur: So, Adam had mentioned for teachers, a new way of asking if there are questions asking, what questions you have, rather, are there any questions? The flip side for students is, ask questions. Because one little secret that us teachers know, is that if one student is confused by something, odds are several or many students are confused by that very same question. But, and this is something teachers also know, we aren't mind readers. If that question isn't asked, whether it's through an email or whether it's asked in front of the class, we have no idea what's going to be confusing to students and what makes sense. Because when we're teaching this material that we've engaged with either as students or as teachers or we've heard people talk about it. It's something that makes sense to us. But we're at a different stage of our development than students are when they first encounter this material. So, another big piece of advice, or to repeat this is, ask us questions. We're not literally asking you just for filler, we want to know what doesn't make sense to you because we want to help breakdown that confusion. And we want to make that material make sense to you all.

Adam: And following on on that, I'm going to go back to teachers for a minute. Those things about give a few low-stakes quizzes, you can put a question in the quiz that says, apart from what we've covered in the quiz, what are you still having trouble with? And I call this a comment question.

So, I do this in my Socrative quizzes, where I take roll using the Socrative quiz, and it's like five questions on the lecture that they were supposed to watch before they came to class. But then I add a sixth question, which is, “apart from the topics we covered in this quiz, is there anything else from the lecture that you're struggling with?” And then I will look at the comment question after I go over whatever the students didn't get to at least 70% of the class. And then I will say, “okay, so in the comment question, we've got these three.”

So like, for example, yesterday, my theory class is working on exchange theory. And they said, “I need to understand why the rational actor is such a weak spot in the theory if it's what the whole theory is based on.” So, I spent probably five, six minutes going over that. And the benefit of that is, as Dinur said, ask it in an email. Well, this gives students another way to ask where they're not being put on the spot because this is something that we do have to be aware of. A lot of students are really afraid to ask questions because it puts them on the spot. And they think that everybody's going to think they’re dumb. And if you can make it possible for students to ask questions anonymously or at least confidentially, that might be a really good way. So, give them the quiz, if you give it on paper, then say on the back, turn it over and write one question

you have that I have not yet answered for you. And then when they turn them in, you just go through those questions and go, okay, so I've got this question, and this question. Five people wanted to know about anomie. Okay, let's talk about that. And for teachers, that can be a really helpful thing for the students, because then they don't feel so you know, under the interrogation spotlight.

So finally, students, remember: confusion, plus the effort you're making to work through the confusion - that's what leads to learning. You are not expected to know what we teach before you watch the lesson, before you come to class. You are not going to be judged for that confusion. Like Dinur said, there's no conspiracy to make you feel stupid. Now, there may be a professor or two out there who enjoys making you feel stupid, and shame on that professor. And teachers, I'm talking to you, don't do this to your students. Don't expect them to know what you learned in graduate school 20 years ago. All right? It's really not fair to them. And so students, remember, most professors are not going to judge you just because you don't know it already. Our job is to help you know it now, not for you to have already learned it.

Dinur: And one thing that I'd like to add, to piggyback off Adam's comment, is I pepper my lectures with a lot of questions. And I'll even ask my students what they know about a certain theory, a certain theorist, a certain concept - not because I expect them to know what I know. I've probably been engaged with this material a lot longer than they have - but I want to know what their baseline is. So, my intro students, for example, went over Marx this week. And one of the questions I started with the beginning is what have you all heard about Marx? What do you know? Because if a student hasn't heard about Marx, that's fine. They're in intro class for a reason. If they have heard about him, I want to know what they've heard. Because I need to know, is there confusion with what they've learned? Or are they kind of on the same page that I'm going to be on.

Adam: So, that brings us to the end of episode 11. So be sure to join us next week when we start our time management series. In episode 12, we'll kick this off by talking about how to use a simple to do list to create powerful results that will help you control your time instead of letting your time control you. And we'll see you--

Dinur: Next week.

[Theme Music]

Adam: You've been listening to Learning Made Easier, a podcast about how we learn, how we teach, and how they overlap.

Dinur: We want to say thank you to all of our supporters on Patreon, who make this podcast possible.

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Dinur: We look forward to seeing you next week.