



## The Difficulty of Desirable Difficulties

### Leading Learning Podcast Transcript for Episode 398

Celisa Steele: [00:00:00] Of the many discoveries that have come from learning science, the role of desirable difficulties in improving learning outcomes and retention has some of the most profound implications for learning businesses.

Celisa Steele: [00:00:17] I'm Celisa Steele.

Jeff Cobb: [00:00:18] I'm Jeff Cobb, and this is the Leading Learning Podcast.

Celisa Steele: [00:00:26] Learning businesses care about creating effective learning. Doing so is at the heart of why learning businesses exist. But what happens when effective learning practices clash with what learners want or what they believe is effective?

Jeff Cobb: [00:00:41] That clash is precisely why we want to devote this episode to talking about desirable difficulties and the specific difficulty desirable difficulties pose for learning businesses.

Celisa Steele: [00:00:54] It's a bit of a tongue-twister.

Jeff Cobb: [00:00:55] That was a bit of a tongue-twister. I'm surprised I got that out.

Celisa Steele: [00:00:58] Let's start by explaining what desirable difficulties are. These are challenges or obstacles that can be used during a learning experience to improve the learners' understanding and retention. It was a term coined by Robert Bjork, a prominent cognitive psychologist, and I think he first used the term in his 1994 study "Memory and Metamemory Considerations in the Training of Human Beings."

Jeff Cobb: [00:01:27] You see him, hear him quoted very often since then in works around learning science. I remember this came up in *Make It Stick*, for instance, this whole idea. And really, desirable difficulties is a theory of learning in which challenge is seen as integral to true,

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long-term learning versus performance learning, such as cramming for a test and performing well in the short term. The fundamental point is that adding challenge to learning activities is going to result in better long-term retention. It's important to note that while desirable difficulty is more effective, it's also usually slower. So there can be a trade-off, a sacrifice of short-term, quick performance gains in order to achieve more durable, long-term results.

Celisa Steele: [00:02:20] We want to acknowledge here, at the beginning of this episode, that we owe a lot to Dr. Brian McGowan, in particular. He presented recently at the Learning Business Summit. One of the things he got us thinking about more was this idea of desirable difficulties and the related issues for learning businesses.

Jeff Cobb: [00:02:42] Indeed. Dr. McGowan does always get us thinking. This was something that we had in the back of our minds to come to eventually, but he brought it to the front of our minds, and we realized it is something that we need to tackle. And so we've got "desirable"; we've got "difficulties." We'll note that the "desirable" part of this is actually key. It's not just about "difficulties" alone.

Celisa Steele: [00:03:06] Yes. This reminds me there's a John Ciardi and Miller Williams quote where they're talking about poetry, which they describe as being a game. They consider poetry, writing poems to be a game, and they talk about games being things made hard for the fun of it. And so I think desirable difficulties are lessons made hard for the effectiveness of it. If a game is too hard, people walk away. If it's too easy, people may also walk away. So it's about that right balance. I think the same goes with learning. If it's too hard, if there's not enough scaffolding, then a difficulty can demotivate a learner. If it's too easy, then that can also demotivate a learner. I'm a board game aficionado.

Jeff Cobb: [00:03:54] You are indeed, yes.

Celisa Steele: [00:03:55] Which you are not, Jeff. But, even though I love board games, I can't stand to play Chutes and Ladders. It's just too mindless. It's too easy for me.

Jeff Cobb: [00:04:04] Yes, and this gets to the issue of appropriateness. What's mindless for you as an adult may be pitched just right for a child who's learning how to count spaces as she moves a marker around a board. So there's that balance there. It's just hard enough for her for it to be interesting.

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Celisa Steele: [00:04:22] Right. So the difficulty has to be desirable, and what defines what's desirable is going to be specific to the individual to a large degree.

Jeff Cobb: [00:04:32] Definitely. Maybe let's talk a little bit about what desirable difficulties look like. What does this include when we're talking about desirable difficulties?

Celisa Steele: [00:04:42] Well, one of the things that Bjork and others point to is interleaving instead of blocking. Interleaving is this idea of you would take related concepts and weave them together. You would practice and talk about them and learn about them all at once, rather than blocking, where you somewhat artificially pull out a singular concept or idea and focus on that. In the sports world, there are a lot of examples we could give there. Interleaving might be more of a scrimmage approach to basketball, whereas blocking might be "I'm going to go out and shoot 200 free throws."

Jeff Cobb: [00:05:18] Right. Or stand at bat to bat the ball 500 times. Or just on your forehand in tennis. That sort of thing. So being able to mix it up and really do the full range of things that you need to actually be able to, in the sports analogy, be able to play the game, which is going to feel more frustrating at first because if—let's say you're just starting tennis—if you go out, and you're trying to do all parts of tennis, it's tempting to say, "No, I'm just going to focus on my forehand right now." There are times when you need to do that. That's useful. But, if you don't get all parts working together in appropriate ways, then you're never really going to master tennis. And the same is true of learning.

Celisa Steele: [00:05:58] Another concept that speaks to desirable difficulties is this idea of spacing instead of massing. Jeff, you already mentioned this idea of cramming for a test. That's the classic example of massing. That's where you're like, "Okay, I've got this test tomorrow. I'm going to stay up all night and review these terms over and over and over." Whereas spacing would be the kind of thing of like, okay, maybe you do still have that exam, but maybe you back up a month or several months beforehand, and you periodically review key concepts that you're covering and that are going to be on that exam. So that idea of spacing allows you then to practice recall. That's, of course, one of the key things that's going to lead to longer-term learning, that idea of retention. Is it something that, okay, you're not just cramming it into your head through mass practice for the next day? But is it something that really becomes part of what you know and understand how to do, which is usually better achieved through spacing and revisiting that concept or that content over time?

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Jeff Cobb: [00:07:01] Yes, and you want to do this. Even if you're in the context of an hour or two-hour traditional course experience, even within that shorter context, you want to make sure you're coming back to things appropriately and practicing them within it. But then also, once you have done any sort of learning "event," you want to be able to carry that out over time and have ways that you're going to. If you attend a conference session, if you attend a workshop, then a week later, two months later, six months later, you want some ways to be able to return to those concepts and apply them. We'll talk about this more in a minute because the bells are probably going off that that's not what often happens with the typical learning business offering. But it's incredibly important. This is an area that Dr. Will Thalheimer, who was also at the Learning Business Summit and has been, multiple times, a guest on the podcast just like Dr. Brian McGowan—we're referencing our doctors today—has done a lot of research in this area in just how important spacing is to effective learning.

Celisa Steele: [00:07:58] Another approach that is often part of creating desirable difficulties is an idea of varying the conditions in which a learner is learning versus always having the same constant, predictable environment. This often naturally comes out of doing more spaced learning versus massed learning because, when you're spacing it out, often you might then find yourself in different environments as you're reviewing materials. Not always. So it's important to call this out separately. Just this idea is it's very different to be in the quiet of a classroom where the focus is 100-percent on whatever the topic is versus if you're commuting to or from work and trying to review concepts, and you've got all the ambient noises, and you don't have visual cues that might exist in a classroom setting that might help you with the content. It's this idea of, again, if you can apply ideas and content in many different situations, that makes it more durable. That means it's much more likely that you're going to be able to retain it and call on it when needed.

Jeff Cobb: [00:09:02] Yes, ideally, for the transfer of knowledge, for the transfer of skills, you want to be able to apply what you're learning in conditions that are going to, as much as possible, mirror how you're actually going to apply them on the job, in life, or whatever. And those circumstances always vary. I can think, just earlier this week, I was driving back from going skiing, and it started absolutely pouring rain. You're sitting there driving in the rain, clenching the wheel, and having to pay a lot of attention. It's a whole different deal than if you're a beginning driver out there in the parking lot making circles. You've got to be able to practice in varying circumstances to then really be prepared to be the kind of driver you need to be in an unpredictable world.

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Celisa Steele: [00:09:46] And then another area that can help us tap into desirable difficulties is testing, an assessment rather than presenting. This idea of pre-assessments or giving learners questions or exams that can be more or less formal, but this idea of you're asking them to go to their current repository of information and knowledge and surface what is relevant versus coming in and being like, "I'm going to present the 10 top things you need to know about X," which can often happen in especially conference sessions or other forms of learning experiences.

Jeff Cobb: [00:10:27] Yes, there's good research around this, that this is one of the most predictable, effective ways to ensure that learning is going to stick is by testing, particularly by self-testing. If you're an adult trying to learn something, just testing yourself in one way or another to make sure that you can actually retrieve the knowledge that you want to be part of your learning, that you're actually able to perform the desired skill repeatedly, this gets into the area of effortful retrieval, which is one of those forms of desirable difficulty. A lot of times it's something that we shy away from in adult learning experiences. We think that people don't want to be tested. They don't want to test themselves—which, if you ask your average learner, they might tell you that's true, but we know that testing is so important. It does create that type of desirable difficulty.

Celisa Steele: [00:11:15] Desirable difficulties can include things like we just went through: interleaving instead of blocking, spacing instead of massing, varying conditions instead of constancy and predictability, testing instead of presenting. Let's talk a little bit about the benefits of desirable difficulties. Why leverage some of these approaches that we were just going through?

Jeff Cobb: [00:11:39] That's right. If we're going to put ourselves through some pain, then what's the gain that we're getting from this? A big one is engagement. When learners are challenged enough to stay engaged without becoming overwhelmed, without the pain threshold being too high that they just shut it out and don't want to have anything to do with it, but just enough of that challenge that it really hooks them, and they want to solve the problem, they want to get at the knowledge, they want to be able to do whatever the skill is, that's really at the core of creating engagement.

Celisa Steele: [00:12:12] And then deep processing is another advantage that can come from desirable difficulties. When we introduce obstacles or challenges, that forces learners to process the information more deeply. This might mean that they have to elaborate on concepts. They have to make connections to prior knowledge that they're bringing to the situation. Or maybe

they're even doing active problem-solving. All of those kinds of deeper processing lead to better comprehension and retention of the material over time.

Jeff Cobb: [00:12:44] And that would be a third benefit here. So we've got engagement, we've got deep processing, and those are going to support retention. Overcoming those obstacles during the learning process creates stronger memory traces. When learners struggle and then successfully overcome a challenge, they're more likely to remember the solution or information associated with that challenge. And, of course, that results in better long-term retention and moves things into long-term memory so that they're there to be accessed again.

Celisa Steele: [00:13:15] And then another benefit is transfer of learning. Desirable difficulties can facilitate the transfer of learning to new contexts. We talked about that a little bit earlier when we were speaking of varying conditions. When learners encounter varied and challenging situations during the learning process, they're better able to apply their knowledge and skills to different scenarios, which then leads to this idea of they're better able to apply it in the real world.

Jeff Cobb: [00:13:43] And so, then, a final benefit—there are more, I'm sure, but these are some key ones we're highlighting here—but the last one we'll highlight is metacognition. Dealing with desirable difficulty encourages learners to develop metacognitive skills, such as self-regulation and problem-solving strategies. Basically, learners become more aware of their own learning process and how to adapt their approach when faced with challenges. This may be more or less conscious, but, essentially, they're becoming better learners because of there being a level of desirable difficulty in what they're doing.

Jeff Cobb: [00:14:26] At Tagoras, we're experts in the global business of lifelong learning, and we use our expertise to help clients better understand their markets, connect with new customers, make the right investment decisions, and grow their learning businesses. We achieve these goals through expert market assessment, strategy formulation, and platform selection services. If you're looking for a partner to help your learning business achieve greater reach, revenue, and impact, learn more at [tagoras.com/services](http://tagoras.com/services).

Celisa Steele: [00:14:56] So we've talked about what desirable difficulties are, we've talked about some of the things that can tap into desirable difficulties, and we've talked about some of the benefits of desirable difficulties. But there's a sticky wicket, which we alluded to at the beginning.

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Jeff Cobb: [00:15:13] The old sticky wicket, yes. I'm not even sure I know what "sticky wicket" means, but I know it's appropriate here.

Celisa Steele: [00:15:20] I think it might have to do with cricket. I should have looked it up.

Jeff Cobb: [00:15:23] Maybe some ambitious listener will find that out and comment or e-mail in to let us know. But we know what sticky wicket means. It's a difficulty for learning businesses because, yes, the truth is learners often don't like things that introduce desirable difficulties.

Celisa Steele: [00:15:42] Yes. Again, we've already touched on this some, but it's just this fact that often adult learners would rather kick back and listen to a presentation versus rolling up their sleeves and taking a pre-test or engaging in a role-play. You'll sometimes get a lot of pushback on that. They just want to come and show up in the room, particularly if it's more of a checkbox learning experience, where it's something they have to do—they need it for a continuing education requirement or something like that—then you might find more resistance in those situations.

Jeff Cobb: [00:16:17] And then, to make matters even worse, to make it an even stickier wicket, is that learners are very poor judges of what actually makes for good learning. They don't tend to believe in the effectiveness of what's effective. So, if you ask them, "Is having this desirable difficulty a good thing? Is this creating a good learning experience for me? Am I learning because of this?" the answer is usually going to be no. They didn't enjoy the experience. So your evaluations, your smile sheets get bad ratings for that particular learning experience.

Celisa Steele: [00:16:47] Yes. In the session that he did for the Learning Business Summit, Brian shared study after study where learners are asked how they learn best. Maybe they'll say that I'm going to learn best by massing, by having that blocked approach to practice. But then they're shown that interleaving actually works better. When they have to try the interleaving approach, it produces better results. So, yes, people, not only do they not potentially like desirable difficulty, but they don't even believe that it's going to be effective, even when they're presented with evidence saying it's more effective.

Jeff Cobb: [00:17:25] Yes, human beings are interesting creatures, aren't we? Of course, the rub for learning businesses in all of this is that we have to essentially deal with opposing goals here. We have to convince learners to buy our courses or subscriptions or attend our conferences, and convenience and ease are valued by those consumers. So we've got that on the one hand.

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Celisa Steele: [00:17:47] And then, on the other hand, ease, convenience, comfortability, and clarity, those aren't always the best ways to deliver effective learning, which is also at the core of what we do as learning businesses.

Jeff Cobb: [00:18:01] Now we get to the essential question. What to do about this?

Celisa Steele: [00:18:08] This is where we end, right?

Jeff Cobb: [00:18:11] Yes, we're flummoxed. We have no idea. We do have some ideas. One, for example, is using some good marketing around this, an educational campaign to show learners how to learn about what's effective, to educate them on why we employ difficult strategies at times. This is something that probably needs to go hand in hand with educating your facilitators, instructors, or subject matter experts, who also often aren't aware of desirable difficulty and how essential it is. Personally, I think, yes, you can educate people about this, you can give them the logic behind it, but I think there can also be pride behind something like desirable difficulty. I think of the old Army ads. Maybe they still run them. I don't know.

Jeff Cobb: [00:18:56] It's the whole "Be all you can be" sort of thing, or "We do more before nine o'clock in the morning than most people do all day." I hope that's the Army. It might be one of the other branches, if I'm misspeaking. But you get the idea. You take some pride in that challenge and in overcoming that challenge, meeting that challenge, and really accomplishing something. I can see educational campaigns that bring that vibe to them, but then also educate people on what it means to be a good learner, how learning happens effectively. I know, for example, the National Rural Electric Cooperative Association did something like this a number of years ago, and it did have benefits. People did tune in and started to have a better idea of what it meant to be an effective learner, what that actually involves.

Celisa Steele: [00:19:39] Yes, I think part of the answer might be making sure that you are helping to send the message to learners that we want to deliver effective learning, and we have spent time paying attention to what yields effective learning, and part of that is desirable difficulties, so that they understand why you're doing it. You mentioned subject matter experts, facilitators, and instructors. They also need to get the importance of it. And I think they may need support from the learning business in a couple of ways. One is around that idea of pitching the difficulty at the right level. I think often, especially if it's a facilitator or trainer who's new to this idea and has done more of the presentation in the past, they might need help. What does scaffolding look like? What does it look like to provide the appropriate level of difficulty that doesn't leave learners floundering and feeling like it's not beneficial? So there can

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be support in that way. I think the other place where they may need some support is you, as a learning business, saying, “Look, we really want to evaluate you around the success of the learners, and we don’t really care what the smile sheets say—that people didn’t like the role-play or whatever.” So I think there can be some messaging there with that internal or external group of facilitators and instructors.

Jeff Cobb: [00:20:57] Yes, and I think it’s an even more challenging situation for learning businesses and your average SME or facilitator that’s working for them. Oftentimes, you’re dealing with an audience of people who are coming from very different backgrounds, very different levels of learning, so what’s a desirable difficulty for one may not be a desirable difficulty for the other. It starts with understanding what desirable difficulty is, why it’s important, but then coming up with some strategies to modulate it across a diverse group of learners.

Celisa Steele: [00:21:29] That’s a good point. I was actually at a conference this past week where one of the things that came up in more than one session was this idea of choice. I think that a big part of that is it can speak to the different levels of prior knowledge that students and learners are bringing to whatever the situation is. Now, another potential approach to dealing with this sticky wicket of the difficulty of desirable difficulties for learning businesses is maybe you take a little bit more of a pick-and-choose approach. For some of your more informational or basic offerings, maybe you don’t need to introduce any or a lot of desirable difficulty, and maybe you focus the use of desirable difficulty in more of your transformational—I use that for a lack of a better word—but more of your advanced and some of your deeper dive-type learning experiences that you offer.

Jeff Cobb: [00:22:27] I think it probably is a hallmark of those experiences. We’ve made the distinction in the past between inform, perform, and transform in learning experiences, and that inform/perform distinction is coming, I believe, from Ruth Colvin Clark. She and Richard Mayer, I think, talk about that in some of their work. But something that is purely informational, that can be about presentation. That’s where your average Webinar falls, and that can be fine. You may not be challenging people a lot in that. They’re just there to get some information, but then recognizing that there are choices up from that. Make those clear in how you’re describing them to your learners, how you’re packaging, how you’re presenting those learning offerings to say, “Look, this one really is more about you getting information. Sit there, take notes, do what you will with it, but, this next one, we’re going to be asking a little more from you because, when you walk out of this, you’re actually going to be able to do some things, and so we need you to actually engage and do some things during your learning

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experience. And this next one is the one that's going to help you make a leap in your career, and we're expecting a significant commitment to that." I think if that's communicated well to learners, and, again, going back to this idea of there being a little bit of pride in that, building the right messaging around it, that could be very effective.

Celisa Steele: [00:23:37] This makes me think of the Value Ramp that we like to use a lot of times. I'm thinking there's a potential application of the Value Ramp where part of that greater value and therefore those higher-price-tag items, part of what represents that value is this desirable difficulty. And so those types of offerings would be further up on your Value Ramp, further to the right.

Jeff Cobb: [00:24:00] Right. You're paying more for pain.

Celisa Steele: [00:24:05] I think that's CrossFit's business model.

Jeff Cobb: [00:24:07] That's right. Exactly. There you go. CrossFit is a perfect example here. Those are two big ideas there: educational campaigns around this to make sure that learners really understand it, that your subject matter experts and facilitators really understand what's at stake here in building in some pride, some positioning around this as a positive thing, and then that pick-and-choose from inform, perform, transform, and being intentional, being conscious about how you're presenting the products across your Value Ramp in that way.

Celisa Steele: [00:24:41] So those are a couple ideas from us, but I don't think we can end an episode on desirable difficulty without asking something of you, dear listener. What we want to ask is that you think about this particular-to-learning-businesses difficulty of desirable difficulties and think about what will you do with it? What are you doing with it? What would it make sense to do? So we hope you will pause, take time to do that, to think about it on your own with your team, and then we would love to hear. We'd love for you to share your ideas.

Jeff Cobb: [00:25:15] That's right. Step up to that challenge, and take pride in it, in embracing that desirable difficulty. And, yes, figure out your solution, and share it with us.

Celisa Steele: [00:25:32] Of the many discoveries that have come from learning science, the role of desirable difficulties in improving learning outcomes and retention has some of the most profound implications for learning businesses. Ignore the value of employing desirable difficulties, and risk delivering ineffective learning. Embrace desirable difficulties, and risk turning off your learners, who are also your customers.

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Jeff Cobb: [00:25:58] Grappling with the difficulty of desirable difficulties and deciding on a stance would benefit every learning business. So we encourage you to carve out time on your own and with your team to understand the issue and think about the implications for how you serve your learners.

Celisa Steele: [00:26:15] At [leadinglearning.com/episode398](http://leadinglearning.com/episode398), you'll find show notes, a transcript, and options for subscribing to the podcast. If you haven't done that yet, please do subscribe so we can get some data about the impact of the podcast.

Jeff Cobb: [00:26:29] And we'd be grateful if you'd take a minute to rate us on Apple Podcasts or wherever you listen, especially if you enjoy the show. We realize it's a little difficult, but Celisa and I personally appreciate reviews and ratings, and sharing a comment provides you with a chance to think about what you value about the podcast and what you get from listening.

Celisa Steele: [00:26:49] Please spread the word about Leading Learning. You can do that in a one-on-one note or conversation with a colleague, or you can do it through social media. In the show notes at [leadinglearning.com/episode398](http://leadinglearning.com/episode398), you'll find links to connect with us on X, LinkedIn, and Facebook.

Jeff Cobb: [00:27:05] Thanks again, and see you next time on the Leading Learning Podcast.

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