



## Student Retention, Interleaving, and Fundamental Concepts: Design Your Course with This in Mind!

### SPEAKERS

Tierney King, Lauren Hays, Steven Benko, Ken Alford and Anthony Sweat, Julie Schrock

#### **Tierney King** 00:00

This is the Faculty Focus Live podcast sponsored by the Teaching Professor. I'm your host, Tierney King, and I'm here to bring you inspiration, energy, and creative strategies that you can utilize in your everyday teaching. When you're designing a course, what should you consider? How can you create a course so students are remembering and recalling the information you're teaching throughout the entire semester. In this episode, we'll explain how fundamental and powerful concepts can help you design your course with the big picture in mind. We'll explain how starting from the end when designing your course is beneficial and will help you create an elevator pitch for your course. And lastly, we'll go over how you can incorporate interleaving into your course design to improve student retention. To start, Julie Schrock and Steven Benko will explain how you can use fundamental and powerful concepts to help design your course and explain the importance of your course in their program, Course Design Strategies to Enhance Critical Thinking Skills.

#### **Steven Benko** 01:06

So the question that we're trying to work through is why do students lose focus? And why do instructors struggle to keep their attention as the semesters go on? And so one bad habit that I get into, or some get into, is that we try to lecture to cover all of the content and we're rushing through material, introducing key terms without really explaining them. And research supports that student attention wanes after 10 to 15 minutes of lecture, and if we're not stopping lecture to reiterate important terms, or to ask the students what they are retaining, then most of what we're doing is not going to be useful to them as soon as they leave the classroom. When this happens, students will just passively take down notes and try to memorize the content for the test. And so what we're building towards is establishing a more clear relationship between a particular lecture and the idea behind the lecture such that when there's no connection between the material and the larger questions that the discipline is asking students, attention wanes and students aren't able to organize the material and prioritize it. So basically, the drive to cover a lot of material leads to bad habits.

#### **Julie Schrock** 02:15

And so after students sit through our lectures, what we know is they forget much of what they memorized. In fact, research indicates the students forget 60 to 90% of what they learn in a course within six months. So what we really want to think about is the 10 to 40% that they're remembering:

What is the most important? Are they remembering inconsequential details? And I like to share the example of when I was a freshman in college, I took an anthropology course that I absolutely loved. I went to class, I did the readings, I took the notes, I hung on every word this professor said, and what I remember from that class, the only thing I remember is that the Yanomamo people blow snot on each other as a form of greeting. Now, I'm fairly certain that, that is not what the professor wanted me to get out of that class. But even as a strong student who enjoyed the class, who enjoyed the material, that's what I walked out with. And so we're really building towards how do you help students know what's most important for them to know and understand as a result of your course.

**Steven Benko** 03:13

So fundamental and powerful concepts are those concepts, which if students understand them deeply, they can use them to understand other concepts and ideas in the course and in the discipline. So fundamental and powerful concepts are deepened by an understanding of how they animate the field. And what we mean by that is that each field, or each discipline, has a question or a concern that shapes inquiry in that field or discipline. What is the question that, that field or that discipline is trying to answer? And the fundamental and powerful concept begins to shape that question. Additionally, the fundamental and powerful concept leads to other interesting and powerful questions within the field or discipline, taking that fundamental and powerful concept and using it to drive research and guide inquiry in that discipline. The fundamental powerful concepts make the field or discipline relevant and important and is used to show how contributions are made in society from that field. So the fundamental and powerful concept connects ideas in a discipline by showing how they can be used to make sense of other ideas in the discipline or field. A detail that you've mentioned in class or in research becomes more significant and worth remembering because of how it relates to that fundamental and powerful concept. Does that detail provide another example of the fundamental and powerful concept? Does the detail provide supporting evidence for why the field is relevant? The fundamental and powerful concept reveals what a discipline does or what a discipline is about. And that's really helpful to students who are unaware of the larger questions in a discipline because they're new to it. It's really helpful to students who are thinking of doing research in that discipline because it gives them a way to organize their research or it gives them an entry point into their research. So what work does the discipline do? And where is that discipline or field making a contribution in society?

**Tierney King** 05:14

So when you're designing your course, and you think about these concepts and how they shape and mold it, you also want to think about the purpose of your course. In this program, Creative Course Design: Yes, You Can! Ken Alford and Anthony Sweat explain the importance of determining why your students are taking your course and who they can become from your course.

**Ken Alford and Anthony Sweat** 05:34

Second thing we want to talk about is developing your course. So once you've got kind of the direction, the overview, you've got maybe a metaphor for it, you're starting to borrow things, put them together, the first thing we would say, as far as a principle here is to clearly define the purpose of your course. The challenge we would extend you, and don't do it now, but just make a note to do this later, do you have a 30-second elevator pitch for your class? If somebody says, What do you teach? And what's the reason you teach it? Have you got just, you know, even a memorized one or two outline of that course?

Yeah, what/why are you doing this course? If you can't do that in one or two sentences, guess what? Your students can't either when they're done. And so clearly define the purpose of your course, it's just really beneficial if you'll do that. And then with that, you know, the education jargon that we've all heard is called learning outcomes. And learning outcomes are really helpful. Maybe just to put a simpler spin on it, is to begin with the end in mind. That's one thing that helps with creativity is beginning with the end in mind. Instead of what am I going to do today? It's three months from now, when students finish this semester, what should be the result? What should they have become? Or what can they do? What do they know? And so let's talk about developing learning outcomes. These are kind of your thesis statements for your course. And they usually should be action-oriented. The best ones that, you know, sometimes they're called "I can..." statements, or "Can do..." statements. One suggestion we have given to use the classic Bloom's Taxonomy. This is Bloom's Revised Taxonomy of his educational domains. The ones on the bottom, they're more knowledge level. The ones in the middle, applying and analyzing and evaluating they are more synthesis level, and then on the top is more creative can do kind of an approach. But when you're taking your course and you're saying to yourself, "Students should be able to understand that. Students will understand. Students can understand. Students can evaluate. Students can apply." And then there's lower levels and higher levels, obviously, the higher you go up the pyramid, the more ability that it takes. So we will actually want to break down learning outcomes into three things when you ask yourself these three questions. What should students know from your course? Second, what can they do? Third, what can they become? And I really want to emphasize that third one, and just so you know, I'm being transparent with you, I'm a religion professor. So things like that are interesting to me. But I think even in general education, we have seen that we can't overlook the kind of human beings we're developing. You know, Clayton Christensen at Harvard gives a classic first lecture to his Harvard MBA students. And his first lecture is, "How are you going to stay out of prison in the next 20 years?" And they all kind of laugh? And he says, "No, I'm serious." And then he lists off all the people he went to Harvard MBA school with that are in prison over lack of poor ethical choices. And so when you're thinking of your verbs for your course, outcomes, think of them as action verbs and give them three positive statements as this. So knowledge is I know. Doing is I can. And becoming is I am. So why should students be able to say I know this, I can do this, and I am this as a result of the class they're taking from you.

### **Tierney King 08:38**

As you design your course, you also want to consider how you can design your course so students are getting the most from it. What can you do to help your students retain information from your course, and use that information past graduation and into their everyday lives? In this program, Using Interleaving in Course Design to Improve Retention, Lauren Hays explains how interleaving, which is the concept of alternating between concepts during learning instead of practicing one skill at a time, can help students distinguish between similar concepts and retain information better.

### **Lauren Hays 09:32**

So let's take a minute and discuss why interleaving works. First interleaving forces learners to pay attention to context. And this makes learning it easier to learn how to transfer knowledge from one domain or context to another so that there's that idea of transfer of learning. That's really beneficial with interleaving. So second, interleaving helps learners notice similarities and differences between content. And third, interleaving forces learners to pay attention to the skills they need to solve problems, and the

strategies they need to use to complete certain types of work. So to implement interleaving, you must first start by identifying the content you want to interleave. So another way of thinking about the content you want to interleave is to ask yourself, what do I want my students to remember? An easy answer to this may be that you want your students to remember everything. However, not everything needs to be remembered at the same level of detail. So for example, we do an activity in one of my classes on total cost of technology ownership. Well, I want them to remember the concept and be able to apply total cost of ownership, I do not need them to remember how to calculate the specifics of total cost of ownership. There are many resources online for this work with spreadsheets that have already been created. Furthermore, calculations for total cost of ownership will vary somewhat based on an organization's or school's budgeting model. Additionally, the course where total cost of ownership is taught, or where I teach it, is a technology leadership class. So while the concept of total cost of ownership is very important, it's not the calculation details that are what I necessarily need them to remember because the class isn't focused on technology budgeting. So even though yes, I want my students to remember total cost of ownership, but it's not necessarily something, the details of the calculations, isn't something that I would say they need to remember all of that when they've left my class. So second, research points to interleaving having the greatest impact when the concepts being interleaved are similar, instead of switching back and forth between vastly different topics, such as economics, literature, and physiology, for example. So it's important to reflect on what you want students to remember, and what other information you want students to remember, that's maybe similar in your classes for you. This may occur in one class. For others, this may occur in a sequence of classes that you teach over time. And if it does occur in a sequence of classes that you teach over time, that can be very beneficial, because you're then using that spacing effect principle as well. And having students recall information, even the retrieval practice, through the recollection of pulling content from other courses, learning it over a period of time, and engaging with it in some different ways. So again, take time and ask yourself, what do I want my students to remember? So I hope you all took a moment to pause and reflect on the content you want to interleave once you know what content you want to interleave the next step is to decide how you will interleave it in your course. So first, let's look at using interleaving directly in course design. So standard course design often uses a blocked approach. An instructor teaches about one topic for a few weeks, students take a test on it, then the instructor teaches about a new topic for a few weeks, students take a test on it. And then at the end of the course, there's a final that covers all the course material in an interleaved approach. The instructor teaches content and continually refers back to previously taught content. This referring back to previous taught content can be done in lectures through activities. It can be done in course materials that are provided, and it can be done on assessments. So another way to implement interleaving is to teach topics sequentially, but assign homework activities that pull from previously taught content so that students are always returning to prior topics, even if you as the instructor aren't mentioning those previous topics that directly to the students on a day to day basis. Other ideas for using interleaving in course design is to give students problems to practice that pull from multiple topic areas in the course instead of problems only the most recently discussed topic. One recommendation for interleaved practice problems is to give students fewer problems that you would than you might in a block practice format because it may take students longer to mentally switch back and forth between the needed skills when they are having problems that are not the same but from different skill sets. Another idea is to ask students to complete projects that require them to use different things they've learned throughout the course or alternatively, different things they've learned throughout the program. And this is where I think

it's a good opportunity to pull and think about how you have designed an entire program, and interleave concepts in that way. And then the third idea is to have students discuss topics they learned about previously, while learning about new content. I certainly did not start using interleaving by just starting with an entirely new course design. I did some different small things first, just telling us students what interleaving was to encourage them to use it in their own studying. And from there, I started finding ways that I can incorporate it, and then it kind of grew from there. So that's what I encourage you to do. Start small. Start somewhere. Figure out what's going to work best for your discipline for your classes for your program, and just keep thinking about the research and what we know about where the value of interleaving really lies.

**Tierney King 16:10**

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