Transcript

Episode 129

Winter Short: Students Perform Best with a Pre-Test | TAPP 129

The A&P Professor Podcast

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Contents

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Introduction

Kevin Patton (00:00):

Guess what? this is one of our winter shorts! Yep, that's right, it's a shorter-than-usual episode in which I present one or two, or maybe three or four, classic, evergreen segments from previous episodes that are remastered, reconstituted, and recycled for your listening and learning pleasure. But mainly it's to give me a break for self-care over the holiday season. We'll be back to our regular programming in late January.

Aileen Park (00:34):

Welcome to The A&P Professor, a few minutes to focus on teaching human anatomy and physiology with a veteran educator and teaching mentor, your host, Kevin Patton.

Kevin Patton (00:49):

In episode 129, I review my somewhat surprising experience using pre-tests in my anatomy and physiology course.

What is a Pre-Test?

Kevin Patton (01:07):

Pre-tests. I think we all have run across that term before, pre-tests. I don't know about you, but the majority of the experience I've had with pre-testing is that it's a kind of test you have to do before you learn something, or before your students learn something, and then the post-test is what you do at the end to see if you've learned it or how much of it you've learned. Pre-test, post-test. We all know about that, right?

Well, I want to talk about the idea that pre-testing has actual learning effects that have nothing to do with the strict assessment part of it. So how does that work? I ran across this idea a long time ago. I ran across, I don't know how or why, I was reading an article, it was a journal article about effective ways of testing in math courses. I must've landed there because I was doing some other kind of search, but it really intrigued me because what this article said was that if you give students pre-tests, just the act of giving them a pre-test is going to make them do better on their post-test, which is interesting in at least two ways.

One is, "Wow, if I do pre-tests, that can help my students learn, so that's what I want to focus on right now," but the other thing is also kind of interesting, and that is if we're looking at pre-tests as simply the partner to post-tests, in order to do a valid assessment of learning that's done in a course, is it really valid? Because by doing the pre-test, I am changing the situation and increasing the odds that my students are going to do better on the post-test.

So if I compare one class where I do pre-testing post-testing, in another class where I don't do that at all, then I'm guessing that the students in the pre-test post-test class are going to do better than the students that never got the pre-test post-test. In other words, by doing assessment, our students are actually doing better. Oh, man. That's a dangerous thought, isn't it, that here's a reason why we ought to be doing more assessment? Oh, gosh.

Anyway, let's get back to the main idea I want to focus on right now, and that is that pre-tests are a good learning tool. That got me to thinking about this, and so I start looking around more and more at the literature and talking to people in various areas. I have a lot of friends that teach mathematics and I would occasionally bring that up with them and say, "Do pre-tests? Have you ever heard about this in math?" It wasn't long before I found out that this wasn't just a math phenomenon, and it also wasn't surprising that a lot of the math people I talked to had never heard of this idea either. It 's just one of these things that was on the horizon at the time, and it's much more widely known now, I believe. I tell you, one of my missions in life is to get everybody doing pre-tests.

Let me tell you about my story, and maybe there's some part of it that you can use in your course or twist it around in your own mind and figure out a way that it'll work best with your students. Here's what I did. I was already doing online testing, and I've covered that already in a previous podcast, so you kind of know about that. In A&P 1, we did nine online tests, and then in class we would do a midterm and a final that was a traditional written face-to-face final.

In my online tests, I already had a big huge test bank that I had built, and it was generating three attempts at every test in order to make that happen. Test one, they'd get three attempts and the learning management system would record the highest grade and that would go into the grade book as a homework grade, but of course we didn't call it that. We called it a test grade, online test grade, and then we'd go to the next one, next one, next one. Three attempts at each one.

I looked at the way I was doing things and I thought about this pre-testing and I thought, "You know what, this is not going to be hard to implement if I want to try it and see if it works in my courses, because I already have the test bank." So I went in there and I just added a new test in front of each one of those existing tests, so the existing test became the post-test and this new test that I put in there became the pre-test, and I used the same test bank. So the test bank for test one was actually generating two different tests. It was generating a pre-test, which they only got one attempt at, and then what would open up later is a post-test and that would generate three different attempts.

Now, learning management systems have a lot of little settings that you can fiddle with, and so I went in there and I set it so that the pre-test came before we started studying that particular topic in the course. So I looked at our schedule and made sure it was open during a brief time frame before we started that. Then, they only got one attempt, as I said. Once they did it, no matter what score they got, then it would unlock the rest of the material they needed to be able to access in the course, so any learning modules, the post-test itself. None of that could be opened up by a student unless they have taken the pre-test.

Now, there's a little caveat there. I found out that some students would go in and answer one question, and that would unlock everything and they'd just skip the rest of the pre-test. So, ha ha ha ha, I'm smarter than they are sometimes, at least that day I was, and so I went in and I set a minimum. I can't remember what my minimum's at anymore. It's been so long since I've set it, but something like 25% or something like that. I didn't tell the students what it was, but they now know that if they get too low it's not going to work. I can always reset it if they tried to game the system and it didn't work and they only had that one attempt, then I can go in and reset it and say, "Okay, now this time really do the whole pre-test." It's only that first one where I really have a problem. Little tip on the side there.

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Kevin Patton (07:52):

I know. I know. I know.

Nobody is eager for a sponsor message. But not only do federal regulations require it, believe it or not, our sponsors expect it. And they're financially supporting this podcast so that there's no cost to you. Yay!

Besides that, I'd be mentioning them from time to time anyway, because all three are great organizations that I'm intimately involved with and they benefit all faculty teaching anatomy and physiology. Can I say that? That I'm intimately involved? I hope that's okay.

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Are Pre-Tests Best?

Kevin Patton (9:25):

Anyway, let's get back to the main idea I want to focus on right now, and that is that pre-tests are a good learning tool. That got me to thinking about this, and so I start looking around more and more at the literature and talking to people in various areas. I have a lot of friends that teach mathematics and I would occasionally bring that up with them and say, "Do pre-tests? Have you ever heard about this in math?" It wasn't long before I found out that this wasn't just a math phenomenon, and it also wasn't surprising that a lot of the math people I talked to had never heard of this idea either. It's just one of these things that was on the horizon at the time, and it's much more widely known now, I believe. I tell you, one of my missions in life is to get everybody doing pre-tests.

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Getting back to the main idea here, though, what happened was amazing. It was amazing. That first semester I tried it, and it happened the second semester too, my average exam scores went up almost one whole letter grade by just doing that one thing of adding in pre-tests. What it does is, and a lot of the learning scientists are arguing

about exactly what mechanisms are going on when we do pre-test, but basically what's happening, we think, is that the students are getting a peek at what they're going to be expected to do by the end.

If they get a peek at what they're expected to do by the end, then they kind of know how to work on it. They know how they're going to be tested in the future. Remember, these are randomized so they're not going to get that exact same test again. They're just going to get a test like it later on. But it gives them an idea of the kinds of questions I'm going to ask, the kinds of concepts I'm going to focus on, what the overarching themes that I'm drawing out of that particular learning module are, and so that's one help of it.

I think another help is it aids in that practice. Learning scientists tell us it jump starts their thinking, gets them like, "Oh, I need to sharpen some of my logic skills and some of my problem solving skills, because my tests include little mini case studies and things like that, so it kind of gives them some more practice on that, like, ooh, these are the kind of cases I'm going to be facing. By the time I get to the end, I'm not going to worry too much about it now. I'm probably just going to guess, but that's going to be stuck in the back of my mind as I go through, maybe if you've practiced a little bit. Then I'm going to get feedback right away. I'm going to know which ones are wrong, because I don't want the wrong answer stuck in my head, so I'm going to make sure I review those.

Once we start that learning module, the students are a step ahead because they've already seen what they got wrong. They've already seen the kinds of things I'm going to ask, and so now they know what to listen for. They know when they're working on a case study in class or some other project. They know the kinds of things they need to be getting out of that. So it jump starts that whole thinking and learning process. At least, that's what we think happens.

Another side benefit of this is that it does set me up for some assessment, right? I can look in there and see, at least in a general way, I can compare the pre-tests and post-tests and see ... You have days like this, don't you? I have days where like, "Am I doing any good as a teacher? Are they gaining anything from all this effort I'm putting in to trying to help them learn?

Then I look at the results and I say, "Oh, yeah. Look at that jump in scores from between the pre-test and the post-test. They certainly do know what's going on. It's not just those handful of students who probably knew all this already before they took my course. What are they even doing in here? That's how I get at least some students that

are bright and shining stars." No, it's really happening with all the students. Of course, with our new modern learning management systems, we can go in there and really dive pretty deeply into the statistics and get even more assessment data out of that than I've been getting, just because I haven't bothered to do that.

Another aspect of it is, something I did for the students, I put an extra entry in their online grade book that showed them the percent improvement between their pre-test and their final grade or their regular test, their post-test, and labeled it as percent of new learning, percentage new learning. They increased their learning by 50%, 75%, 25%, whatever it is, and that became a motivation for them. At least a lot of them gave me that feedback, that, wow, that's really cool, that I really feel good. Okay, I didn't get the high A that I wanted to get, but that high B was a huge improvement of what I started with. That's going to help a little bit. Next time I'm going to work even harder and try to get them both up, not only the grade itself, but the percentage of learning, see if I can get that up if it's possible.

That kind of ties into another concept in learning science that there's a lot of talk about these days that's called gamification. That's where students get tokens or coins or prizes or special sound effects when they reach a certain level of performance, and that's kind of a way of doing that. It really is self motivating when that happens. We'll talk more about gamification in another podcast, but right now I just want to talk about the fact that, in fact, just giving pre-tests, and pre-tests can be done online, even if you're doing the other tests offline, that is, in class, you can either make your own test bank the way I did it or use either the test bank from your textbook publisher or one of the adaptive learning tools that most publishers and other third party vendors have available and try this pre-test thing and see if it doesn't help your own students.

Staying Connected

Kevin Patton (15:13):

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We'll pivot back to fresh, full episodes in late January, when I'll be giving my predictions for next year. If you have a prediction for where A&P instruction is headed, please send it in!

I'll see ya down the road!

Aileen Park (16:12):

The A&P Professor is hosted by Dr. Kevin Patton, an award-winning professor and textbook author in human anatomy and physiology.

Kevin Patton (16:24):

This episode has been reconstituted from concentrate using only 100% pure electrons from a natural spring.