



Active Learning versus the Lecture

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Teaser

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From IDEA, this is Sound IDEA.

David Pollock: We've heard the lecture is dead and active learning is king. But others have pushed back claiming that the lecture has worked just fine since the beginning of formal learning, and the rift has created opposing pedagogical camps on some campuses and across disciplines. It's active learning versus the lecture in this edition of SoundIDEA. I'm David Pollock.

For some people there is no debate. Lecturing is an outdated and relatively ineffective way to teach while others contend that it has worked just fine for 100s of years and the current vogue of active learning is just a trend at best, or fad at worst, that is taking unnecessary time and energy from faculty.

CHARNEY: OK everybody, let's get started. Remember your first major exam is on Monday.

David Pollock: On a recent spring day at Kansas State University, Mick Charney, associate professor of architecture opens his History of the Designed Environment class.

CHARNEY: And it will cover everything up through today's lecture. There is really only one maybe two other buildings I want to talk about before your exam and there will be a...

David Pollock: Charney's class is large--nearly 150 students. They sit in an auditorium style lecture hall with a big screen at the front of the room. Charney stands to the side of it as he presents a number of impressive images of the buildings and concepts he describes.

CHARNEY: Here's what we think it looked like in a digital reconstruction when it did serve as a temple to all the gods. And you can see these niches quite clearly, fronted by pairs of columns that create columnar screens but between those niches there were tabernacle like architectural elements sorts of Tabernacles which had statues of the seven planetary gods.

David Pollock: The ability to stand in front of students in real-time to describe elements of architectural history while also showing them specific images is important to Charney.

CHARNEY: Look at the rays of the sun as they come through the Oculus of the Pantheon. This is the summer solstice here, there's the winter solstice way up there and right here every April twenty first at an angle of sixty degrees is a shaft of light which exactly at twelve noon will shine from the Oculus onto the main entry of the Pantheon.

David Pollock: This delivery of the knowledge from professor to student is a necessary part of the learning process says Charney.

CHARNEY: It causes students, forces them in some sense, to really hone their own listening skills and to wrestle with ideas and concepts that they've never heard before and to acquire the patience that's necessary to follow an idea all the way through to its logical conclusion.

David Pollock: Left to their own devices through just reading a text or even active learning experiences does not provide the instructor-guided introduction to content that is needed he says.

CHARNEY: So I think especially with the introductory courses where the students virtually have no background in the material it's important that they get a foundation of the basic information and facts. So I think at the beginning levels, the introductory first year levels, it's important that they be able to sit there and listen to, admittedly, a one sided discussion and take in the information.

David Pollock: But Charney is hardly unaware of how traditional lecture has fallen out of favor.

CHARNEY: I know there's a big debate going on in their polar opposite positions about whether or not active learning is more effective than traditional lecturing and lecturing has become a sort of whipping boy in higher education especially. We tend to blame something that goes wrong in higher education on the lecture. The students aren't learning this, that or the other thing as a fault of the lecture but I've just heard some outrageous statements about lectures. The one I recall the most is somebody who stood up in a session and said, "The lecture is dead". And I'm thinking to myself really, dead? He said we ought to abandon it entirely. Some people might think the lecture is dead but I don't think it's dead. I think there are still great value to the lecture.

PRINCE: There are really literally hundreds of studies out that show very clearly that active learning is simply more effective for achieving pretty much any educational outcome you would care about with pretty much any type of learner than traditional instruction

David Pollock: Michael Prince is Professor of Chemical Engineering at Bucknell University and a researcher and you might say an evangelist for active learning.

PRINCE: Asking the question, "Is active learning more effective than traditional lectures?" That is no longer an interesting research question. That question has been asked and answered hundreds and hundreds of times and the results are both consistent and compelling.

David Pollock: But Prince is quick to say that lecturing is not inherently bad.

PRINCE: Proponents of active learning such as myself, don't think that lectures are evil or lectures are bad. Lectures are simply one of many educational tools. So what we feel is that lecturing is not evil but it's overused. People who lectures are all the time are like people who only use a hammer. And you know hammers are good for some things but hammers are not good for some things.

David Pollock: The problem, Prince says, is that faculty feel compelled to cover the content of the course.

PRINCE: It's freeing to recognize that, you know, my job as an instructor is not to cover material. The point of teaching is not coverage. The point of teaching is learning. And so when you can show people that by talking just a little bit less students will actually learn a significant amount more. It tends to at least open people to the possibility that they could try a few minor things.

David Pollock: But this covering of material as Prince calls it, is good pedagogy says Charney and is superior to other forms of delivery like providing students with recorded lectures.

CHARNEY: I just think there's something about the dynamics, the face to face of the person physically there in a classroom interacting with material that's being presented through voice intonations and gestures and expressions and pregnant pauses that allow the student to have time within the lecture to reflect. Without that sort of dynamic, person to person dynamic, if a student were just to sit there on their own to listen to a recorded lecture, I think there are so many distractions that they encounter at home that and wondering about the effectiveness of that approach.

David Pollock: Prince would agree that the lecture is not dead. But it has to be used appropriately he says.

PRINCE: The lecture should be one tool of many and faculty should recognize that in general students will learn more from their class if they think of lecturing as something to do sometimes but not all the time and break their lecture up into more digestible chunks and do more to figure out what students are learning and where they're confused.

Sound: PSU class

David Pollock: Across the country at Portland State University in Oregon, Jennifer Kerns teaches US history and spends a good bit of time lecturing.

KERNS: Look at the language. The first of civil right, every American was to be free of violence.

David Pollock: But a colleague convinced her that saving time at the end of a lecture for students to grapple with the day's content in discussion would lead to greater retention and understanding.

KERNS: That just made a lot of sense to me so he suggested that you do it at the end of the typical sort of hour lecture but I thought it would be better to do it after you know you sort of cover a subtopic.

David Pollock: So students come to class having reading the text and some original documents and Kerns lectures on subtopics for about 20 minutes and then she stops for a discussion activity.

KERNS: Let's just think of Portland metro. If you want to desegregate the region schools, but did not have to consider the suburbs by court order, how will that play out in terms of integration?

David Pollock: Students divide into pairs or small groups to grapple with the question.

STUDENTS: So it is basically just contradicting where you know they're just already going to be segregated. Exactly it's still going to keep that you know where African-Americans only make up like five percent of the school yet while the majority are white. You're not fixing the problem here.

STUDENT: And if you're not including the suburbs, what are they going to do, bus around the city. You know like, it's kind of hard to think about how that would work in the sense of like you're not really moving people from one place to another you're keeping people in there like priests segregated districts.

STUDENT: Yeah, yeah, yeah. It's just not working. It doesn't make since.

KERNS: I think they're engaging with some of the ideas that are introduced by that and that's enhancing critical thinking and so I'm happy for them to have critical thinking moments.

David Pollock: Back at Kansas State University, Michael Wesch, known for his engaging and innovative teaching, has just opened class with an activity in which students are literally moving about the room. But then he segues to mostly lecture for the majority of the class.

WESCH LECTURING: I want to like sort of title this first section "How to get rich" and this is for those of you who like ask me how you make lots of money this last time but the answer will be different than you think. So here's how you get rich, but this is all in play of course, but basically what happened was I was sitting in a class like this and we were studying New Guinea in anthropology class and the first love my life broke up with me and I started to think, "man to be great to just get away" but go to this place and this is one of those examples of like where an obstacle becomes an opportunity and I started like daydreaming about going to New Guinea and really just kind of starting over.

WESCH: Learning is always going to be active but that doesn't mean a lecture can't inspire that kind of action. So when I lecture, I try to tell stories that are very personal, emotional and inspiring with the idea that it will inspire active learning later.

STUDENT: So you go out there on a whim or did you go out there as a project for anthropology?

WESCH in class: So the question is, did I go there on a whim or for a project for anthropology? So I went out there on a whim pretending it was a project from anthropology.

Class: {Laughing}

WESCH: I really got this from some of my own professors growing up, just realizing that you know you can walk into a lecture and when you walk out you can't not talk about it and so that's where the act of learning was happening right.

David Pollock: For Wesch, the difference between a good use of lecture and an ineffective one comes down to purpose. Using them primarily to convey information is not the most effective use he says.

WESCH: I think the lecture instead should be all about inspiration rather than information, making connections and demonstrating to your students the joy of thinking and making connections through the material.

David Pollock: And the power of the lecture he argues comes not from delivering content but from storytelling.

WESCH: If lecturing is storytelling, I'm all for it. Most of my lectures are essentially, usually if it's a fifty minute lecture, it'll be twelve to fifteen stories strung together. And there are like, there's science behind this, you know. I mean we know that people remember about sixty three percent of what they hear in stories and only five percent of what they see supported with numbers. So stories are very powerful. They speak to us on a number of levels and most importantly I think they inspire deep learning. And this is the key to me is like that superficial learning where there is memorizing terms has very little use and has a very short life span.

David Pollock: So what exactly is active learning and how can it and lecture coexist?

PRINCE: Active learning is a broad umbrella term for a whole variety of teaching techniques. And what all those techniques have in common is there are two elements. First, the instructor asked the students in their class to do something, some activity other than listen to them lecture and take notes. And the second element is whatever the instructor asked them to do, has to get students to think about or engage with the material.

David Pollock: But just doing some kind of activity is not the point says Prince.

PRINCE: Activity in and of itself doesn't necessarily wear into memory or learning. In some people when I think about active learning just stay focused on the activity and think I just give these kids something active to do they'll learn something and that's just not true. The activity is secondary. The point of the activity is to get the students to think and engage. If the activity gets them to think and engage about what you want them to learn, it's a good activity. If it's just an activity that doesn't do that it's a bad activity. So for example, if I'm teaching thermodynamics and I asked my class to stand up and stretch that might be a nice activity but it's not active learning. That is there's nothing about the activity that gets students to think about or engage with thermodynamics. So if it has those two elements, it is active learning and if it doesn't have those two elements, it is not.

David Pollock: Simply stopping a lecture for a few minutes, Prince says, and asking students to write down their muddiest point, or presenting a question based on lecture content and having students come up with an answer in pairs presents opportunity for engaging with the content in a less passive way than just individually taking notes.

PRINCE: I think the reality is that most types of active learning are neither terribly complex nor are all that impressive when you hear people describe them. What's impressive is the difference in a learning that you

see with these techniques. Again most of the techniques, I think come across as is almost trivially simple and the question that faculty have is, "Honestly Mike, is stop the thing for ninety seconds twice in a class and asking students to do this activity, is it really going to make any difference at all?" And I think the surprising thing for most faculty is when you look at the data the answer is, yes it does. That's the part that's impressive rather than the sophistication of the technique itself.

David Pollock: But what about those large lecture foundational classes where a lot of content needs to be learned in limited time and professors do feel compelled to explain, or cover, all the content.

Classroom sounds

David Pollock: Ashley Rhodes teaches biology at Kansas State University in one of those large lecture courses.

RHODES: With that, we're going to continue right where we left off yesterday. Yesterday we began by discussing the differences between prokaryote and eukaryote...

David Pollock: But rather than just presenting the information, Rhodes builds into each class, time for students to work out some of the content for themselves.

Rhodes in class: I'm going to give you a sort of a skeleton drawing of a cell. With this, I want to see how much can you tell me about how you make a protein in a cell.

RHODES: What I'm going to ask him to do is use the information we learned last week to finish this drawing and then we're going to go through the steps of protein production and we are going to break this process and see how diseases can develop but they don't get any more than just this right here and they have to work together in pairs to finish this drawing.

David Pollock: Students take the partially completed drawing of the process they are discussing, either on their computer or a printed copy, and can work alone or with others to complete the drawing that explains the biological process they are learning.

Rhodes in class: I'm going to give you probably five to seven minutes to do this. I think you can do it in five minutes.

STUDENT: So the pre rna can either exit the nucleus and go straight into the rough er and it can go through translation there to a vesicle or it can go straight to the cytosol and find a...

STUDENT: Right, but if it goes into a free ribosome then it's not going to go back into the rough er so that's going to stay in the cell she said it was like it's going to be packaged to go out of the cell so it's going to have to go into the rough er and then it's going to have to go and like make form a vesical and go into the golgi.

STUDENT: Either way the golgi can send out vesicles to trap them.

RHODES: And so that is a form of active learning because I'm a full believer that if you're drawing and thinking about what something looks like you can't just drift off because your hand will stop moving. So there's some cognitive activity that has to occur in order for them to finish this. So they get time to work on this while I walk around and then we'll come back and I'll do it with them so they can check their answer. Sort of fulfilling that feedback part of active learning which I think is missing sometimes. And then we'll go on to the next one. Instead of pushing content, I give them the pieces, I asked him to put it together and show me what does this look like to you and then I evaluate that.

PRINCE: Really the basis for active learning a lot of the reason why it works is most faculty with the best intentions in the world cover material at a level and at a pace that no nineteen-year-old brain can simply absorb and master. And an active learning what we're really doing is pausing every so often and giving

students a chance to make sense of and digest the information that we've just delivered before they move on.

David Pollock: So even proponents of active learning, at least some of them, are not saying that the lecture as a teaching method is completely dead as some have said.

PRINCE: The lecture is not dead nor should it be.

David Pollock: But it's overused says Prince, and there are active learning techniques that can help students learn more effectively--as long as those techniques are well done says Prince.

PRINCE: There are plenty of activities that don't lead to any learning at all the point of active learning is they get students to actively engage and think so if you asked to do an intriguing, relevant activity that gets them to think that's it that's a good active learning. If you just give them something trivial to do that's not the act of learning and students will rightly say that's a waste of time because it is

David Pollock: So both the lecture and active learning can be used poorly, but just maybe, when done well, they can both contribute to learning. Even our defender of the traditional lecture has compromised some.

CHARNEY: I've also changed my attitude towards lecture and so today, last few years especially, I don't lecture straight, unbroken. I pepper my lectures with questions. I can lecture some period some sessions all the way through and other sessions I like to involve the students so it's not purely lecture but it isn't one hundred percent active learning either.

David Pollock: It seems clear that most leaders in teaching and learning would argue that the lecture is not the best way to teach students in most situations if just conveying content is the intent of the lecture. But throwing the baby out with the bathwater--labeling the lecture as the practice of out of touch professors--seems to be going too far. The lecture can have its place in many courses when used appropriately. Moving some faculty toward a more appropriate use of the lecture is still the challenge for some. And getting faculty to use active learning methods when and where they will do the most good is also a continuing challenge. Check out our resources and links for active learning, and send us your thoughts about this podcast or ideas for other topics. For IDEA, I'm David Pollock.

