MAGNA ONLINE SEMINARS

Transcript

The Flipped Classroom: Rethinking the Way You Teach

A Magna Online Seminar presented on August 23, 2012 by **Ivan A. Shibley, Jr. (Ike), Ph.D.**, associate professor of chemistry, Penn State Berks and **Timothy D. Wilson, Ph.D.**, assistant professor, The University of Western Ontario, Schulich School of Medicine and Dentistry.

Educators who participate in this seminar will acquire new tools and concepts to help them:

- Apply the basic neurobiology of learning to the flipped classroom
- Improve learning with technology that flips the classroom
- Identify technological tools that can improve learning in higher education
- Design course assignments that more effectively incorporate technology
- Implement a flipped classroom that enhances student learning

Editor's note:

This is a written transcript of an audio recording. Our policy is to edit only the occasional unintelligible phrase. Everything else appears exactly as it was spoken.

Ike Shibley, Ph.D.:   Hi, and thanks for signing up to attend the upcoming Magna seminar entitled <u>The Flipped Classroom: Rethinking the Way You Teach</u>. Tim and I wanted to stay true to the pedagogical philosophy that we're espousing in this particular seminar, so what we're doing is giving you a mini lecture prior to the actual seminar. One of the things we'd also like you to do is to watch just a three-minute YouTube video called *Flipping the Classroom Simply Speaking*. By the way, the video was created by folks at Penn State, so this is Ike in case you haven't figured out, and I'm kind of proud of my colleagues who made the video.

So what you're watching right now is a screen capture. The program I'm using is called Camtasia. There's a free version of this called Jing and there are other types of software for this. What I'm doing is capturing much of what I want to say so that I don't have to say it in the seminar, in the classroom. And it's an example for you guys to see how you could use a screen capture like this. A flipped classroom really does what we're doing right now. We're moving the lecture that typically occurs during class, and we're moving it before class, so we're flipping.

I can tell you that recently in *The Chronicle of Higher Education*, Nigel Thrift, who's Vice Chancellor at the University of Warwick, was writing about the future of higher education. And I have this quote, this is what Thrift said, quote, the early years of an undergraduate degree will gradually cease to be via lectures and will instead take the form of online presentations produced by professionally trained presenters backed up by teams of academics. I'm not sure I completely agree with that. I think the teachers themselves are going to become the trained professionals.

We're going to need, teachers are going to need a whole new skill set, not just to produce videos like this, but because the flipped classroom no longer has lecture, now you've got to find ways of doing problem solving, doing debates, doing small group discussion and large group discussion. I've often said that the teacher in the 21st century is going to have to be much more of an improviser because the teacher is going to have to find ways to interact with each student at the level of the student. It's a much better teacher to student ratio. We're trying to approach one to one teacher to student ratio. This flipped classroom allows us to do that.

I want to extend one more thought about this and we'll talk more about this flipping in the seminar. But Bloom's Taxonomy, I think for too long has been looked at as a hierarchy as the bottom, the blue knowledge there has to be built before you do the next. That's not really accurate. There are a lot of ways to think about flipping Bloom, turning the triangle upside down. I actually like to think of it this way, that we want students to remember and understand some of the content.

In order to do that, though, there's evidence now that suggests that if we work with students at these higher levels of evaluation and creation, that's a little like the rain that helps the content, the comprehension, grow. The roots are application and analysis where you have to expand and really work with the nutrients in the soil to help build that base of the pyramid. I'm not sure that this is certainly not the only way to reconfigure Bloom's, but I think Bloom's Taxonomy has a lot of power, but it's been misused in a lot of ways in higher education.

What we're trying ultimately to do is get to learner-centered understanding of the content. The learner has to be the one that builds their own knowledge tree, and they do that through application, analysis, creation, and evaluation. I don't think the creation is the end-all and be-all. What you're doing is creating in the student's mind this sense that they can completely grasp a subject in their own terms. Too often when we do a lecture model, we want the students to grasp a subject the way we think about it.

And that's why this particular slide, which we'll also show in this seminar and it's one that I keep reemphasizing, this teacher-centered approach is one where we try to convince the students that they need to think exactly like us. In a learner-centered approach, we're working with the student, we're working on a particular swing. We're helping the students understand how to think about cooking in their own terms and work on fingering. We work in a lot of groups because the team dynamic brings a lot of different opinions together and now there's a social construction.

We're going to deal with a lot of these type of issues in our seminar, but ultimately what we hope is that you'll take a learner-centered approach to it and make the information your own. We want an understanding of flipping the classroom, not to be the same flipped classroom that Tim and I think about, but a flipped classroom that you feel comfortable with and that you feel empowered to implement in your professional career. We're really looking forward to working with you, and I hope this introduction gave you some brief explanation about how you can use pre-class work to help set the stage for learning that will occur inside the classroom. See you soon.

Rob Kelly: Hello, and welcome to Magna's online seminar, The Flipped Classroom: Rethinking the Way You Teach, cosponsored by Magna Publications and *The Teaching Professor*. I'm Rob Kelly, editor of *The Teaching Professor* and today's moderator. I'm pleased you could join us. If you haven't already printed the handouts, select the file you wish to print from the fileshare box on the left of your screen and then click save to my computer button to download, open, and print.

And now, I'm pleased to introduce our presenters, Dr. Ike Shibley and Dr. Tim Wilson. Ike Shibley is associate professor of chemistry at Penn State Berks, a small four-year college within the Penn State system. He has won both local and university-wide awards for his teaching including the Eisenhower Award presented to a tenured Penn State faculty member who exhibits excellent teaching as well as mentoring other teachers.

Tim Wilson is an assistant professor at the University of Western Ontario in The School of Medicine and Dentistry. He has won both departmental and university level teaching awards and was even cited as one of his province's best lecturers. Welcome, Ike Shibley and Tim Wilson.

Ike Shibley, Ph.D.:   Hey, thanks, Rob.

Tim Wilson, Ph.D.:   Thank you, Rob.

Ike Shibley, Ph.D.:   So you guys, hopefully already have seen the chat window. David made it a little bigger, which is good because there are a lot of participants today and we'd like, as much as we can, to keep you guys involved in the discussion. What we're going to try to do is make this as interactive as possible rather than a canned lecture. We do have some slides, you've seen them, we're going to work through them, but we're going to keep an eye on the chat window and we'll hopefully to able to answer questions and interact as we go through. So we're going to do our first poll and Rob's going to call this up. There you go.

Tim Wilson, Ph.D.:   We told you we were going to test you, now show us what you know.

Ike Shibley, Ph.D.:   And again, for those of you who haven't done a lot of online video conferencing like this, there's a lot to keep track of. We do have a chat window that you'll want to at least look at now and then because people will be talking, chatting. We are going to have the screen, and we'll share it. We'll have the PowerPoints, but we're also going to look at some other things as we move around. But anyway, oh, you guys are all doing well. We've got more than half the participants have already voted, oh, way more than half. Awesome. All right.

So it looks like we want alternative design. Cool. We are going to talk a little about the neurobiology of learning and just a smidgen about technology, but that, some of that can be in the supplemental. Okay. We have another question. We got to get back here, so just hang on. All right. So what about this one?

Tim Wilson, Ph.D.:   We can vote, right?

Ike Shibley, Ph.D.:   No, Tim.

Tim Wilson, Ph.D.:   We can't? Oh, come on.

Ike Shibley, Ph.D.:   And I see your note, Seneca. We'll go back and let this, sorry, I clicked through really fast. By the way, for those of you who teach online, Adobe Connect is one of the ways to do that. Even if you flip the classroom and you prerecord some lecture, there are times when you want to use Adobe Connect. At least in Pennsylvania and Ontario, we sometimes have snow days and it is possible, if we don't want to come in if the school opens late, you can tell students that they can stay at home and connect through this. We do this at Penn State more and more frequently. All right.

So it looks like screen capture is the one you want although some of the synchronous learning, I think seeing Adobe Connect in action through a seminar like this does give you some sense for how it could work in the classroom. All right. So let's close that. And I see Dickinson wants all three. All right. And Tim's typing back. All right. So those were what we're looking back. Learning management systems, I'm getting the sense, are pretty ubiquitous nowadays. So I still think they're misused in the same way PowerPoint can be. Just because something becomes ubiquitous doesn't mean that it's being used in the most pedagogically effective ways.

But anyway, synchronous learning is a whole other debate, but we'll address some of that and then screen capture, great, because that's what we use to do some of this. All right. So let me at least walk you through the supplemental materials because hopefully you guys have printed them out, and we're not going to get to talk about everything in the supplemental materials. This is only an hour long and we want to make sure that you have something to take away.

So there is some information about flipping. On pages two and three, there are just a lot of different categories of the types of technology you can use. We are not going to even touch on them, but you have them available to you. We do have some questions you can try to ask yourself. If you're going to use a flipped classroom, you're going to have to learn technology and . . .

Tim Wilson, Ph.D.:   Yeah, there's no doubt.

Ike Shibley, Ph.D.:   Yeah. So, oh, okay. So I'm not sure what I'm supposed to do, Rob, if we're losing some sound because I know we're recording this too. So I think North Central, I'm going to try to slow down, but I think we have to keep moving forward.

Rob Kelly: Keep moving and we will provide a recording for, if there are technical problems, there will be a recording of this so we can provide that as well.

Ike Shibley, Ph.D.:   Okay. All right. The other pieces in the supplemental materials are three major theories about learning. A lot of you probably know some of these, *How Learning Works*, the newest of them by Ambrose, Bridges, DePietro, Lovett and Norman. Weimer's book, *Learner-Centered Teaching*, had five changes that have to occur. And then Chickering and Gamson is one of the most cited works that looks at seven good practices in undergraduate education. And then we just have a simplified way to at least start to think about flipping a classroom on page six.

And then I am a chemist so I included a syllabus for the course that we haven't completely flipped, but pretty close. Students do a lot of work up front, and then they come to class prepared to do a lot of clicker questions. So that's at least some of what you've got in the supplemental materials. All right? All right. We have a question for you.

Tim Wilson, Ph.D.:   Now this only works if you've done your homework ahead of time. And it really illustrates the power of flipping the classroom and you really need to illustrate it to the students in a step-by-step basis to sort of get them in. And so if you wouldn't dare, please try to answer this question. It was related to the video that was assigned to look at through Penn State.

And if you haven't seen the video, don't feel bad. You'll still get something out of the rest of this. This is just to illustrate how one might feel if you haven't done that homework ahead of time. And we find it to be a really nice way to invite everyone into the fold of flipping a classroom. And you'll notice that a lot of people are doing their homework, I think.

Ike Shibley, Ph.D.:   I know. Yeah. All right. We can probably broadcast that.

Tim Wilson, Ph.D.:   Sure.

Ike Shibley, Ph.D.:   Thank you, Rob. All right. It was about invasive species, it was, right? They had a little stinkbug on there and, but this is a way of at least getting students, not to make students feel bad if they haven't done it, but a way to kind of check that the students know that there's some level of responsibility that comes with a flipped classroom. There still aren't a lot of flipped classes, and it's going to be incumbent upon you as the instructor to give the students positive reinforcement for having done the work. I think the worst thing you could do is find out that students didn't do the work and then segue back to traditional lecture mode.

I think you've got to move forward and it takes a lot of fortitude on your part because students still have been trained, for the most part, to just sit passively in class and not do much preparation, so . . .

Tim Wilson, Ph.D.: Agreed. And that'll certainly work to the model we're going to speak about later as where the center of effort needs to go to for the students and you as the teacher. So if we could maybe close this and move back into our time. We can maybe take a little bit of an example of how we might start to do a few activities once we moved away from that pre-knowledge base and move them into activities that might work in a flipped classroom.

From the video, what did you see there? Anyone that wants to include some things on the chat list. There were a variety of examples of activities that might take place in the classroom. Love it, Margaret. Debates, group work, by Julie. More debates, problem solving, didn't see the video, that's very honest.

Ike Shibley, Ph.D.: Mount Saint Vincent.

Tim Wilson, Ph.D.: Working examples of things that were presented in some of the videos or examples that were portrayed in some of the work you may have assigned to them ahead of time. And this allows the student also to take a little bit of their own initiative and pick examples that speak to them personally. We have all kinds of people that may care tons about nature and may not really care, and they move towards electronics as their example. So it's really nice that the research ideas coming out here quite nicely, Dave. And so we're starting to see that everyone's moving forward here.

Ike Shibley, Ph.D.: And I think it's important for teachers to realize that just because you've flipped the classroom doesn't give you the latitude to just fill the time with busy work. You still need to have pedagogically clear goals for what you want. It's not enough just to have a debate. You have to allow students to buy into why they're having this debate because it's really easy to use the lecture, the flipped lecture, as a crutch to make it, I don't know, easier for you to do things in class without having to have clear learning goals. You still need them and students have incredibly attuned sensors to BS.

Tim Wilson, Ph.D.: Yeah, I totally agree.

Ike Shibley, Ph.D.: And if you're wasting their time, oh.

Tim Wilson, Ph.D.: And by doing so, you remove the ability to express, and this is for another debate, really, is not to have opinion, it's based on solid knowledge that they learned ahead of time or it's pre-knowledge that they bring with them. So maybe we'll move forward one more slide here. And are there any concerns that you may have about the suggestions of flipping the classroom after watching this video?

Things like, Ike and I were chatting previously, and I'm not going to cede it yet, but we thought of a few things and were wondering, passive

students says Fanshawe, absolutely. And the video that we watched allows us to find those students and potentially invite them more into the discussion or illustrate to them how one might engage in the activity. Let's see.

Ike Shibley, Ph.D.:   Yeah. The complaint about extra work, I really think it's incumbent upon teachers to explain to students that you're just flipping where the work is being done because you're actually dong more problem solving in class.

Tim Wilson, Ph.D.:   And so Alabama asked if one-on-one ratio, I think what we're doing there, you start to break the class into smaller groups such that the ratio of you moving your time amongst them reduces that teacher to student ratio very much than standing in front and being that sage at the front dispersing information. They can teach each other, and you can monitor that as you float around the space.

Ike Shibley, Ph.D.:   Yeah.

Tim Wilson, Ph.D.:   Recommended size per class, see that, Ike, St. Clair. That's a tough-y. If you have TAs in the room, this is a multidimensional way of teaching this new form of education. You can train your TAs to also be moderators inside this flipped classroom and disperse the work allowing the class to grow a little more with this model. I have done it with 60 as my sort of limit thus far, simply because I don't have the students to do it. Ike, do you have anything to say there?

Ike Shibley, Ph.D.:   We've done it with classes of 60. I'm doing it this semester with a class of 80 . . .

Tim Wilson, Ph.D.:   There you go.

Ike Shibley, Ph.D.:   Yeah, I think you can. I mean, I'm a big advocate of clickers and so if I can get some of the information up front. I like the comment about the two different types of videos that we gave you. One we couldn't show you because of copyright information, but it's on YouTube, the Simply Speaking. That was a professionally made. The other one that we made with Camtasia was slow and it was a lot more boring, and I think beginning teachers using the flipped classroom are limited in a lot of ways because we're not technology proficient.

But I don't think that's a reason to stay away from it. I think you start with something that at least gets the information out and then over time you can learn to improve it. As you become more proficient with the technology, you become more proficient with the theory that goes along with how to engage students, move things around. Yeah. Those pre-class lectures are not the easiest things to produce, so I think that was a good point.

Okay. So this, up until now we've been talking about what you're doing with a flipped classroom and that's the pancake here. Really what we're trying to do is to get students to do some work prior to class and you guys expressed a lot of concerns about that. There are ways with learning management systems to make a short five-minute, five-question survey or a ten-question quiz about something that students did. You can open up some kind of drop box where they have to do an assignment, even if it's a short piece of writing just for you to check.

All of you have to decide how you're going to make students responsible for some of this lecture. But once you get in the classroom, you now have to be aware that you want the students to have done this work, and so you need to proceed as if they had. If you want to give, start class with a quiz, you can do that, but I think that the use of technology, getting students to be responsible before they ever get to you is important because what you'd like is instead of problem solving after class, which, in the sciences, this is the typical model.

We bring students into a large lecture hall, we tell them what they should get out of the reading, we maybe write a couple problems down and show them how to do it. And then we turn the students loose and when they need us most, when they reach the first problem that they don't understand how to do, they are alone in the wilderness. And even if they have questions about it, what's going to happen is the next class period that they come to, you're going to start by lecturing all over again on a completely new topic.

So what the flipped classroom does in a lot of ways, is it gives you the space where students have already blocked out that time, that hour on Monday, Wednesday, Friday, and you can give them problems so that you can go around, maybe with some teaching assistants, maybe with some peer mentors. I'm at an undergraduate institution and we use undergraduates to help with this, anywhere, usually about one mentor for every 15 students works for us. But we do problem solving in class, in chemistry, in organic chemistry, in nutrition.

That's a big change, and it's a big change for faculty and, you know, if there are any administrators out there or teaching and learner-centered folks, I mean, you have to be patient with faculty who are trying this because it is a very different approach. A book just came out by a couple of high school teachers called *The Flipped Classroom* that, that's really a nice, it's short, it's only 100 pages, but they actually give you a nice way and, by the way, it's on the bibliography that we provided. It's by Bergmann and Sams, and even though it's high school, it relates to college.

It shows that you can give students more responsibility and that they will rise to that challenge, and I think it's great. I agree, you got to flip your mind too, buddy.

Tim Wilson, Ph.D.:   Good, Ike.

Ike Shibley, Ph.D.:   So I mentioned this briefly in the introductory, so I'm not going to talk about it much again other than the fact that Bloom sometimes gets flipped on its head. You can turn the triangle over, you can think about it in different ways. This is the way I used in the prerecorded lecture and, by the way, I'm trying to watch some of the questions as they come in too. And, yeah, the reason we asked you guys to watch this ahead of time is so that we have time to interact with you more.

I don't want to go through everything that I did in my previous or boring Camtasia, but there are ways of rethinking Bloom's Taxonomy. So I encourage you, if you use Bloom, and I think there's a lot of good in Bloom, but just try to get students using some of those higher level things in a flipped classroom because they'll have more fun, they'll be more engaged.

Tim Wilson, Ph.D.:   Okay. So I'm typing up a storm here too, so sorry, guys. And since we didn't want to know too much about the neurobiology of learning, and shame on you for saying that, I'm hurt. No, I'm not, I'm not at all, this is fine. And we can boogie through this quite quickly, but I think we can all agree that to learn requires memory. Without any source of memory, learning becomes much more difficult and the way we think of it at a university level. There are tons, and some will argue, there's tons of other learning that can occur, and I totally agree.

But we're talking about high-level memory for high-level knowledge requisition and learning. And the way we get at this to think about it is, the neurons of our brain, there are a kajillion of them, and it's not so much the neurons but the way they interact with each other, the synapses. And during a learning situation where we see here in this diagram this very simplistic model of nine dots is exposed to some type of stimulus and that changes the way those neurons interact with each other. And those of you that know about neuroscience, understand that there can be a chemical, there can be temporal, there can actually be some type of spatial reconstruction of these neurons to enable us to maintain a recollection of what happened.

This recollection can take two sort of, two types of descriptions. The implicit side of it, which some of us deal with if we're working with exercises or with large sets of skill sets. Those of you in kinesiology and health sciences, medicine, dentistry, where there are some physical

parameters that need to be learned by the learner. And there is the explicative, the explicit knowledge, the declarative stuff about learning a phone number or understanding a theorem that is much more difficult to hold onto sometimes.

Learning to ride a bike, you wreck yourself a few times, but once you have it down, it's very hard to get rid of. And that's like I'm saying right here is that the implicit memories are much longer whereas the explicits are requiring a lot more time and practice to get there. And, again, we show off on the bottom that exposure to some type of stimulus changes the way these synapses interact with each other. In order to have memory, we must have some way to take in the outside environment through sensory inputs there on the left.

And this is built on Richard Mayer's cognitive load function, if you recognize this at all. The sensory inputs in our cases are usually audio and visual, unless you're working in the areas of potentially chef instruction, communicative science where you're teaching alternate ways of making memories, olfaction, and gustatory may be secondary there, and I'm sure you could think of others. The point is that they make their way into our short-term memory. And this is of very limited capacity, we can only hold onto it for a few seconds. Some say up to 30, other say, no, not more than 10, and its capacity is low.

This is where we get the idea of a phone number only being seven, and now we've changed it in most of the North America to nine digits. It's making it harder for us to remember these numbers. We quickly must move this, however, into long-term memory and long-term memory is, from what we can tell, unlimited in capacity. It just has this static inertia of moving short-term memories into the long term, and that has to do with the consolidation of those memories. Consolidation is also another form of saying we're creating knowledge.

What gets in the way here is that red large arrow called forgetfulness and this is where I think the power of the flipped classroom really comes into its own. As we start to meaningfully repeat, meaningfully rehearse things that students have learned about on the surface beforehand, they can look at them multiple times if they wish, and then we move our way into making worked examples to help them avoid the forgetfulness such that our little sort of plasticity that's occurring in the neurons is not lost and it doesn't return back to that resting state of not having a memory. So we got to remember that forgetfulness is at least as important as consolidation in learning, and I think we often overlook that as teachers as we just try to flip their head open and dump it in there.

And finally before I move on, I'd like to illustrate that these memories aren't just randomly associated in little, tiny neuronal packets here and there. They are organized in another level of developing schema in order that the learner can contextualize this new information. So as I learn about building my bicycle as I look over at my bike, I understand how to put a tire on, and the tire is actually very important to running this two-wheeled bicycle. And if the chain is not there, then riding the bicycle becomes very difficult. I'm creating a schema of understanding around my bicycle.

This can be applied to understanding civil history, it can be done with surgery, it can be done with amalgam formation in teeth. A schema is a very important piece in which the idea of flipping the classroom builds on the idea of forming schema. And we do this in the classroom after the student has that initial chunk of information by developing some tasks and this is where I saw on the chat line about labs. This is where labs really come into their own because you can flip your class ahead of time, talk about some activities in class, and what I do is go right to the lab afterwards, and we develop these goal free tasks to continue on to essentially identify, and I'm in anatomy, so we identify and understand how the anatomy is working together.

So it is, the goal is to understand how things work together, but you may not actually get to that point until you've achieved all the steps along the way and created that schema. Using examples along the way and completing them in class is a wonderful way of building schema. The students also start this before they come to class by integrating their own sources of information. This is an information age and believe it or not, I'm sure I don't have to tell you this, but students are much more resourceful than Ike and I or you are, I'm sure.

And finally, I think reducing the amount of redundancy we have in class and I don't mean just repetition, but the way we formulate our worked examples and using our multiple modalities also has a lot of influence on how we can move information from short-term memory into that long-term memory. And that could be a case of just reading a little bit on cognitive load, which is too much for today, but there is a little bit of an example here in the slide that you might want to look to. Ike.

Ike Shibley, Ph.D.:   Yeah. So as I'm watching the chat, there's a lot of interesting back-channel going on. One of the concerns is trying to condense all your lecture into, right, if you're used to a two-hour lecture, how can you reduce that? And there is a sense that we think everything is important, but I think we also fail to trust the other types of resources that we're using. I know in our chemistry course, we use a textbook, so the lecture isn't as much to give them the same information. When we're talking, we'll say, hey, before you

watch this next section on nomenclature, make sure you look at pages 71 to 73 because there are the rules for how to name an organic compound.

And that cuts down a lot of time. You don't have to read through all the rules. You don't have to give students all the definitions. In fact if you are, I'd argue that you're doing the students a disservice. You want to use the technology in a way that enhances other aspects that you're doing. It maybe that you say, hey, you guys can look up some of this information on the web, so we're not going to go through it. But this is what you need to know, here are your learning goals. Anyway, it's tough. Someone said flipping the mind of the teacher is difficult and it is because we're used to telling students everything they need to know and we . . .

Tim Wilson, Ph.D.:   And they're used to seeing it that way too, Ike.

Ike Shibley, Ph.D.:   Yeah. So the audio portion is what we do. We kind of say, hey, this is the way you name an organic compound. I don't think students necessarily need to hear it. You might want to work through an example and talk them through each of the rules as you go through it, but just to list the rules, oh. So I'm going to violate that as I list seven rules here for how learning works. If you haven't looked at this book, it's a pretty nice book. It's, these are all in the supplemental materials also, but these help you think about the flipped classroom. This was not written, this book was not written for the flipped classroom.

But one of the things you can do prior to students coming to your class is figure out what they know and what they don't know and what misconceptions they have because we need metaphors. Constructivism says that students build with what they already have in their brain, and they need to learn to forget some things, as Tim pointed out, because they're just wrong. But then you need to give them something to build better knowledge on. How they organize their thoughts is important.

I really like the study that looked at chess players and asked chess players to memorize a board. And as long as the board represented something that dealt with chess, and we have a slide on this coming up, but they're okay. Experts in chess organized their thinking about the board differently than non-experts. This is kind of a belief system, but I hope that you all believe it that you have the power, as a teacher, to help cultivate student buy-in to your course.

And you can use the blended design to do that. The blended design is great, this, the flipped, I'm calling it blended because it is blending technology, but flipping gives students a way to develop mastery inside the classroom where you can help or the TAs can help. They do need

practice and they need immediate feedback. Clicker questions are great for this, but those debates, those problem solvings are good for that.

We do need to understand some of the theory about student development, right, Perry's intellectual development or attribution theory where students start to believe that they're not good at something and therefore, they won't perform well because they think that no matter how hard they work, it's not going to matter. We need some of those theories to help us get a window into how students learn and how we can do better in designing our flipped course. And then I think ultimately we want self-directed learners.

And a flipped design, if you're flipping, and this was kind of the Georgia Health Sciences discussion that was going on, if you're flipping the classroom and all you're doing is putting all your lectures online in a boring format, you already saw what a seven-minute video can feel like. You guys are going to multitask, students are going to drift off. Most of the recommendation is to keep these videos as short possible, preferably less than ten minutes on each individual topic, and help the students to figure out what they need to do to learn the information on their own rather than just listening to you.

This, let me go back to this chess, the chess example real quick. In this example, in the study, what were given to the folks was the task of memorizing where the pieces were on a chessboard. Okay. So experts were given the same chess layout as non-experts. If the pieces were randomly assigned, the experts and the novices did about the same. They were just trying to memorize pieces and figure out where they were when they were asked to fill them in. But if the board represented an actual game, the experts were multiple times more likely to remember where the pieces were because they were chunking information into moves. They knew where the rook was compared to where the queen was and the king.

And that type of expert thinking is what we want to move our students to. If we don't, then students are memorizing one bite of information at a time, and it is no wonder they're failing a lot of our courses because I think we failed them in helping them to think like an expert. What I think I'd like to do is kind of go onto a screen sharing. What are we looking at here? Tim, do we have anything that I need to talk about in the chat?

Tim Wilson, Ph.D.:   I think we're doing fine right now. A good question came up, what about chopping things up in ten-minute segments? And I'm trying to type out and I'm just full of errors. But, Margaret, I think, from Memorial, I think it was, looking at, it says here, develop the ability to concentrate in students and follow an argument. If we keep chopping everything up into ten-minute segments, so I think she's concerned a little bit about offering

knowledge up to them ahead of time and will that then decrease their ability to synthesize things in class.

And so I would say no, that those small vignettes, they're not even vignettes, the small sets of knowledge that they're getting ahead of time, they don't have to be ten minutes, but research has started showing that the attention spans of people do not last 50 minutes anyway. A good lecturer has pauses throughout the lecture and changes gears a lot in order for us to attend to the appropriate information. If we gave them a 50-minute movie, they would still get up at 10 or 15 minutes and go to the bathroom, lean back, settle down, in order for them to reestablish attention to the appropriate things.

When we bring them back to the classroom, this is where we can really bring out those argument style of debates or mulling the information over. And I heard a good word, noodle it out amongst others.

Ike Shibley, Ph.D.:   So I guess you guys can see my screen now. What I'm doing is just giving you a sense for what a blend, a flipped classroom might look like. This is a nutrition course that I teach. And one of the things I can show you real quick is, when students have to fill out a three-day diet analysis, they have to use a USDA website, and what you're seeing here is just me showing them how to do it. And I'm using a screen capture video, this is again, Camtasia, but there are others. And what it does is it takes the students through how they should be doing it. I'm talking, but you guys can't hear that.

And I planned this out, I figured out what areas I wanted to show. I had already typed in some information. So it's still ten minutes, but I used to get so many questions about how to do this assignment and when I recorded the screen and went through and showed them how to do it, I no longer get criticism or concerns from students who are confused. They really like this. So it's one small way of sharing information ahead of time outside of class. Another thing that I do with Camtasia is that I actually show them exam reviews. So what I can show you here is that I record, actual exam, explanation. So what I've done here is I just scan the exam and then I no longer go over this in class.

So you, I think you get the idea. I don't want to take a lot of time with that but I did want, and I'm going back to sharing the document, I did want to at least show you some ways of flipping and how to use Camtasia to help you. All right. So we should be coming back. Hopefully, I've hit the right buttons. Excellent. All right. So everyone's, oh, we're back on technology, that's what everyone's seeing, I guess. All right. So this technology that we're talking about, the learning management system, whatever you're using, the Camtasia, the Jing, the Kaltura.

There's also ways of getting students to write reports. Google Docs is a great way to get students to share and collaborate. We do need to find ways for students to work online outside of class also because we know students aren't going to get together physically. This was always a major problem with outside of class group assignments. Technology allows us to do more of this collaboration. So, but there's also videos. You guys always think that you have to come up with your own. There's a lot, The Khan Academy for Science and Math is really great.

But TED Talks, have students watch a 20-minute TED Talk that are incredibly fascinating. They might relate to something you do. Bring that into the classroom. So I guess we can, we have some time to answer a couple questions. Because I saw, I see two related questions that I've been looking at, how students respond to this and how colleagues respond to this. And I'm just going to go to the next slide here because we're going to get to maybe a couple case studies, but if nothing else you guys can think about these.

Students initially are often resistant to the flipped classroom because they're used to you presenting them with all the information. And I've already encouraged you that you're going to have to be a salesperson, you're going to have to tell students why you're doing this. And I really, I encourage you not to do it in a threatening way. Students respond much better to honey than vinegar. Explain to them that you care about their learning and that you've taken the time to do some of these pre-recorded lectures so that you have time in class to help them develop the skills that they will need for the exams.

Someone talked earlier about students working towards whatever assessments you use. That's a true statement. If you can find ways to tell students that they're going to do better on the tests in the current format, it will help. Colleagues, I can tell you I've heard just anecdotes. One of my advisees was in a colleague's office and they asked them about clickers and the colleague said, oh, the chemist, I don't know why they're using clickers all the time because now all the students seem to want them. It's like I'm not sure we won any friends, but having students ask for some of these same technologies outside of our classroom, but students will start to put pressure.

Faculty who don't use a learning management system, students start to ask why? Why can't I see my grade? Why can't I get information if I miss a class? Why isn't there information to help me prepare better for class? Why aren't there more practice exams or practice quizzes? I have, I teach all lecture halls, anywhere from 40 to 80 students. And, no, I never teach in a computer lab. Everything they have to do is something ahead of time.

So, and we tell students up front, I've already sent, we start class on Monday, I've already sent a note to my students explaining the course and giving them access and telling them that they should write to me up front if they have concerns or questions. But they've already got the first three chapters that have the pre-recorded lectures and there are quizzes for each of those chapters. And then we are going to meet and start talking about that and start doing problems and clickers in class.

Tim Wilson, Ph.D.:   We got some good chatter on the discussion board, Ike, about different, yeah, it's really starting to pile up here. I can't keep up. But there's a really, how does the flipped classroom work in relation to courses that do not necessarily work problems up? And so this may be some of the reason why English professors, political scientists and historians are not sure about the flipped style. But I would suggest they already use a flipped style in some initial way because they're asking for pre-reading to be done.

Ike Shibley, Ph.D.:   Yeah.

Tim Wilson, Ph.D.:   I would believe, and that's a form of flipping.

Ike Shibley, Ph.D.:   It is. The collaboration . . .

Tim Wilson, Ph.D.:   Sorry.

Ike Shibley, Ph.D.:   . . . that I have up here, Barbara Walvoord has a really great piece that I hope I've included, I have, *Enhancing Pedagogical Productivity*, where she talks about flipping so that instead of lecturing, she just meets with small groups of students who have already done the reading ahead of time. This was written more than a decade ago, but I would argue that she could have enhanced the reading with maybe a five or six-minute podcast or a Camtasia introduction to what she thought were some of the most important points of the reading so that when they came to class, they understood what they were supposed to be talking about.

Giving students questions, discussion questions ahead of time to think about so that when they come into the classroom, they've already thought about Iago's motivation or Hamlet's melancholy. So I don't think that a flipped classroom is only for the sciences.

Tim Wilson, Ph.D.:   Neither do I. Neither do I. And in lessons from different and potentially older disciplines have been doing it for some time.

Ike Shibley, Ph.D.:   Yeah. I agree. And that's what one of the comments is here that we have, oh, that's you, Tim. Good. You're so smart, I like working with you.

Tim Wilson, Ph.D.:   Oh, you're just very complimentary. Thank you.

Ike Shibley, Ph.D.:   This is, again, we're just going through some of these case studies to get you thinking. But using newspapers, students can access things online. I like being current. In my bioethics class, we have weekly quizzes that relate to newspaper articles, and we decide on the articles in class. At Penn State, students get free access to *The New York Times*. They can get a hard copy paper, but they can also access it online. And we have quizzes based on the discussion we have in class so they have to read the article ahead of time, we come into class, and then they have a quiz on Fridays about those articles. So we can post the articles for them so that they can click on it.

That's just one example, but I think there are ways in a lot of your classes, certainly political science, certainly economics, even history. I mean, I think you, history professors often want to talk about how current events will be recorded in history and how the messiness of history actually comes about. I mean, I think too often students think that history is this nice organized body of information rather than specific views of a very complex occurrence.

Tim Wilson, Ph.D.:   Ike, just one before, it's on the same slide here, but some people are asking about prep time and technologies. Can you speak to any of that? Or even about the amount that we could potentially cover as the content go down? And I started to write that it may have to go down slightly.

Ike Shibley, Ph.D.:   I don't know. I, in my organic class, I've actually increased my content coverage . . .

Tim Wilson, Ph.D.:   Wow.

Ike Shibley, Ph.D.:   . . . because, and I think I've done it without more student work because the students now have access to some of the information that is fairly mundane. I can go through the boring stuff. So the first class period, what I'm doing with the students is moving into an area where I think model kits are really important. And it's one of those subjects that's difficult to do online, but if I get students in groups building model kits, I can help them see it's a concept called Newman projections. But I think if it's well designed, certainly you won't lose content.

Tim Wilson, Ph.D.:   I would agree. And I guess I was looking at it from the side of how much do I have to put on a slide overhead or some of my own material. I feel that goes down because they then start to branch away and use the roots that I've given to them to then branch away and pick up that content in their own fashion, and that is part of the why it may work a little better.

Ike Shibley, Ph.D.:   Yeah. Was there another question that came up, Tim, that I missed?

Tim Wilson, Ph.D.:   Oh, gosh. There's a lot booming through here, and I'm finding it hard to keep up. I need somebody younger to help me.

Ike Shibley, Ph.D.:   Technology, you asked technology. All right. So I'll let you look while a talk a little bit about the technology. The quote that I gave you about the future of higher education relating to prepared classes by trained professionals, I do think that there are going to be pressures on higher education to put more and more online, to make more accessibility. Because students, and I see it every summer, I see it during the semester, students want to look for online classes. Now that's different than this flipped model, but as you learn technology, as you get more familiar with it, I think we're all going to have to learn some of this.

And I think it's important to talk to professionals at your campus about what type of technology your campus or your institution supports, and start to learn, you know, Adobe Connect for synchronous or Jing for screen capture, how to use quiz banks in your learning management system. The technology is a barrier and I know it takes a little time to learn it, but once you've learned it, it starts to become just a tool and you'll use it to become more creative. But just like students need metaphors in order to build more knowledge, you need some of the technology to help you think more creatively about how to flip your classroom, so . . .

Tim Wilson, Ph.D.:   That's good.

Ike Shibley, Ph.D.:   I'm still trying to look at . . .

Tim Wilson, Ph.D.:   Yeah, me too. This one, this is a neat one and I didn't know, I have not heard of this, a classroom and a-half issue when using hybrid or flipped classrooms. Have you ever heard of that?

Ike Shibley, Ph.D.:   Well, I think what happens is that, and I'm not sure if that's exactly what we're getting at here, but I think faculty often put too, so much in the flipped and then they feel the need to talk about it again. We really have been trained to become lecturers. We want to talk, I mean, I'm doing it right now. I want to talk at you.

Tim Wilson, Ph.D.:   Yeah, you do.

Ike Shibley, Ph.D.:   But, oh, it's, I don't think it's the way students learn, it's, it . . .

Tim Wilson, Ph.D.:   No.

Ike Shibley, Ph.D.:   So . . .

Tim Wilson, Ph.D.:   I agree. They're trained to learn that way. They just don't know if it's the best way for them. We've been trained that way, as you suggest.

Ike Shibley, Ph.D.:   Yeah. So . . .

Tim Wilson, Ph.D.:   We train like we were taught.

Rob Kelly: That class and a-half, I think that refers to a workload issue for the instructor.

Tim Wilson, Ph.D.:   Oh, okay.

Ike Shibley, Ph.D.:   Thanks, Rob.

Tim Wilson, Ph.D.:   Yeah.

Ike Shibley, Ph.D.:   There is a workload up front. There is no question that you will have to invest some time. Not all institutions do this, but a lot give faculty either some summer compensation through a grant or some summer help through the IT staff. We've often been able to hire student interns who can do some of the more mundane things like create quiz banks and edit some of the Camtasia that we're doing, put in some sound. They become editors, and well-intentioned editors because the students know they've taken the course. So, but that doesn't always have to be, you can just hire student interns who know about technology.

But if you don't have that kind of support, yeah, this is going to be a lot of up front work. It does get easier once you have it because you just start to modify some of that information. Yes, there are technology changes. Yes, your institution will adopt different software and you're going to have to learn to be flexible. If there's a mantra in 21st century education for teachers, it's that flexibility is part of the job description. So I don't know if that helps or not, but I hope to motivate you that the effort you put in, if done well, I think will save you time in the long run, and it will help your students learn better.

Tim Wilson, Ph.D.:   I agree with that.

Ike Shibley, Ph.D.:   And there are, I don't know if you guys know, Humber just asked a question. Special needs are a critical issue. Penn State was sued for that. Penn State's been having lots of issues in case you haven't been paying attention to the news. But we now have to make sure that we're ADA accessible and so we're learning different software, we're hiring student interns to close caption some of our lectures. It's one of the reasons, you know, a two-hour lecture is also not that great an idea because trying to go

through and close caption that whole thing will take a lot longer than two hours.

So students, and there's another question that came up about limited access. If you have a computer center, students at least can go to the computer center, and I know access is still an issue in some areas. It's, every year it seems to be coming less and less of an issue. So you'll have to judge from your institution and your student data, student pool, how much you want to put online. Maybe just small amounts, just enough to get students ready. But really for everyone, you know, conciseness is a monumental asset in education.

You want to try to get your point across as quickly as possible and so brevity is the soul of wit and tediousness its limb and outward flourishes, so try to be brief. And we have up here just the learner-centered teaching, by the way, so hopefully you've looked through that. This is, again, this wasn't designed for the flipped classroom, but it really does put the, the flipped classroom helps to put the learner at the heart of education because of what you can do inside the class.

And Weimer, I've used this a lot, she does not talk about technology, but if you look at all five of these, I think the flipped design attends to every single one of these because you can give students more responsibility, you can organize before they ever get to your class. You can help facilitate what they're going to do inside of the classroom by using technology up front. You can give them responsibility by making sure they've completed online quizzes or done a Wiki post. And you evaluate them online so that they're ready for some of the high stakes evaluations inside the class.

Yeah. Thanks, Skagit Valley. By the way, Tegrity is a good one, I think that's actually what Penn State is using. So this is kind of what we've been talking about this whole seminar. We're trying to move you away from that left picture and into the right. And the way, one of the ways to do that is to use technology.

Yeah, some of the learning objectives were for you to understand the benefits of a flipped design, to understand some of the technology that comes with it, to understand how you can use pre-recorded lectures to help motivate students to do work before they ever come in to you, to use those lower levels of Bloom's Taxonomy outside of class so that you can use the higher levels inside of class to help them develop knowledge and learning.

So this is where we hope to leave you. We want students on the right. Learning is about changing the mind of the learner. And I'm not sure that the gentleman on the left is doing a lot of changing by just telling students how to solve problems and giving them no opportunities in class to use

their own minds. This is a passive approach. I'm convinced that it is, it's outdated, and we are irresponsible if we continue to allow ourselves to view learning in only this teacher-centric mode.

Tim Wilson, Ph.D.: I agree. We're looking at a living dinosaur here, folks.

Ike Shibley, Ph.D.: And the evidence is accumulating. We haven't had a chance to go through this, and Magna is very keen on making sure that we give you examples and we talk about the practical side of this, which is why we haven't talked a whole lot about theory. But there is increasing evidence that students will do better on tests, will develop much higher levels of thinking in this flipped design, in this learner-centered approach.

I mean, we have a manuscript that's under review right now that looked at 3,000 students over 10 years, 5 years in a traditional design on the left, and 5 years of the design on the right. And we have taken student performance on the exams and students passing the course from a little over 50% to almost 75%. That's an n of 3,000. We're pretty confident that what we're doing is making a difference and there are, there are more and more studies accumulating that demonstrate this. And I think we're almost out of time.

Tim Wilson, Ph.D.: Oh, my goodness. That went by so quick.

Rob Kelly: I think maybe a, you know, question or two more. We have about two minutes left.

Ike Shibley, Ph.D.: Oh, good. So we did, I'm looking through here. Yeah, Seneca College keeps chiming in about active learning. We haven't talked a lot about what to do inside a class. I mean, that little three-minute clip ahead of time on The Flipped Classroom Simply Speaking, gave you some ideas. But folks, you have got to become intentional designers of active activities, active learning strategies inside the classroom that engages students the way you want those students in that right-hand picture engaged. You want them talking . . .

Tim Wilson, Ph.D.: I totally agree.

Ike Shibley, Ph.D.: Oh, sorry, Tim.

Tim Wilson, Ph.D.: Well, no, I totally agree. And this is the larger challenge of flipping the classroom. The easy part is getting that technology to help you capture some of the content you want to give, but the hard part comes with the creativity that's been sort of pushed down in many of us, that we've learned to be the teacher on the left when we, our mind and body says we

should be the guide on the side that we see on the right, but it's much more difficult.

Ike Shibley, Ph.D.:   So I'm going to answer two questions that came up. One is how much time. Tim and I have talked in other seminars about blended classroom design, which is an extension of the flipped where you actually limit the amount of time. This flipped design is still the same amount of classroom time. But I think as you evolve, you'll find that you can almost make the classroom time less. Instead of meeting three days a week, you only meet two days a week or something.

Freeware, there's a lot out there. Talk to your IT folks. I'll tell you that Jing is the free version of Camtasia. It allows you to at least test it out. There are a lot of these type of activities, a lot of software that does allow you, Web 2.0 technologies. I'll type it in, go Web 2.0 technologies.

Tim Wilson, Ph.D.:   While he's typing, even your LMS, your learning management software, is starting to involve a lot of the tools we're chatting about here. They may be rudimentary at first, but speaking with your teaching and learning centers or the people in charge of this lets them devote more budget to tools that will enable you to do the flipped style of approach without you taking it from your own pocket or budget to get there. And it needs to come from the floor, both students and us.

Rob Kelly: Okay. That's all we have time for. Thank you, Tim and Ike. Thank you all for joining us. For more from these presenters, be sure to check out their upcoming face-to-face workshop, Blended Learning Course Design: A Boot Camp for Instructors, in Cambridge, Massachusetts, on September 29th and 30th. Your campus has received an e-mail evaluation form from us. Please fill it out and tell us what you think of today's program and what programs you'd like to see in the future. Complete information about our upcoming seminars and the *Teaching Professor* newsletter is available at www.magnapubs.com. Thanks again for joining us and have a great day.

Ike Shibley, Ph.D.:   Thanks, guys. Bye.

Tim Wilson, Ph.D.:   Bye-bye.