Transcript - 2022 INCLUSIVE Summit: Disciplinary Matters Sciences Session

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KIM: --to support this work. Before we get started, I'd love to go ahead and ask everyone to introduce themselves, perhaps share what their discipline is and what their institution and their role is at their institution. So I'll let you chime in as you would like. I know we've got several participants, so if you're comfortable, please go ahead and say hello.
DEBORAH WESTAWAY : Hi, my name is Deborah Westaway in Boston Bunker Hill Community college. I teach nursing.
KIM: Wonderful. Welcome, Deborah.
DEBORAH WESTAWAY : Thank you. It's great to be here.
DEBORAH TAYLOR: I'll go. I'm also named Deborah.
[CHUCKLES]
Deborah Taylor. As you can tell by my seat behind me, I teach anatomy and physiology. I teach a couple of different places, but right now I'm teaching at a Johnson County Community College, but I'm affiliated with the University of Kansas, and I also work for the OLC and teach others how to teach online.
KIM: Oh, welcome, Deborah.
DEBORAH TAYLOR: Thank you.
INETHA: Hi my name is Inetha. I teach for Navarro College and I teach computer science.
KIM: Welcome, Inetha.
ALEXIS KOWALIK: I'm Alexis. I teach chemistry. I'm an adjunct at Harpur College and one of the city colleges of Chicago.
KIM: Welcome, Alexis.
JENNIFER HOWZE-OWENS: Hi, everyone. Jennifer Howze-Owens. I am actually in instructional design faculty, but the sciences is one of my divisions I cover on my campus, so I just kind of want to jump in and hear your experiences and how everything is going in your courses. So happy to be here. And sorry on the-- I'm at College of San Mateo in California, so I'm going to turn my camera off and finish my lunch. But I am engaged.

[CHUCKLES]

KIM: Wonderful. Welcome, Jennifer.

MEGAN TESENE: I just wanted to note as well that we also have two Jennifers, in addition to two Deborahs. We've got Jennifer Garner introducing herself in the chat. Looks like she's not in a space where she can turn on a camera or microphone. Don't worry Jennifer, feel free to nudge me. I'll help you facilitate chat as necessary. Jennifer teaches microbiology at Ventura College in Southern California. And I'm also seeing Abby Thompson. And I am going to mispronounce that word, because it has a lot of vowels in it. I'm in Indiana, I apologize. And she teaches psychology. Again, she's not in a place where she can unmute. And I appreciate you guys chiming in there.

And again, as I said, feel free to participate in the chat or verbally as you can. And we'll do what we can to integrate you. I'll go ahead and introduce myself. I'm Doctor Megan Tesene. I'm the director of the personalized learning consortium at APLU. We're helping host this event. I am here as backup to Kim to help facilitate the conversation.

KAREN VIGNARE: Hi. I'm the lurker in the crowd. I'm also with APLU. Karen Vignare. Used to teach more or less business related courses, but some computer scientists as well. But I have a fondness for entry level scientists. So I'm eager to learn from everybody how it's going and what advice you have.

KIM: Wonderful. Welcome, Karen and Abby and Jennifer as well. Is there anyone else who would like to say hello and introduce themselves, or have we got everybody?

MEGAN TESENE: I think that's everybody.

KIM: OK. Well, wonderful. Megan, if you want to go ahead and share the collaborative document. And so--

MEGAN TESENE: Just let me know if you can't access it for some reason, but you should be able to, not only access that link, I've seen folks popping in, but you should also be able to edit directly into it.

KIM: So just to reinforce, our goals for today is to provide opportunities for science faculty and those interested in the sciences to participate in the discussion about equity-based pedagogical practices. And then to share resources, ideas, and actions that can be used to promote equity in the classroom.

And so, one of the things I'm most interested in is trying to provide some concrete things that you can take back and hopefully implement at your institution or within your classes. And so to kick off our discussion, I wanted to ask, what does a student-

centered approach aligned with equity and inclusivity look like in the science classroom? And so I'm kind of curious what you all think. And feel free to type in the document or to just speak as you'd like.

DEBORAH TAYLOR: Well, I'll talk just a few things. I-- actually, it's Doctor Deborah Taylor, but I always forget to use that little title that I worked very hard for. [CHUCKLES] I'm very much into utilizing adaptive learning, and I've used the resources out there from you all for quite a while.

That's one of the courses I teach for the OLC is adaptive learning techniques, et cetera. And that I find it just promotes equity in such a way, because it gives students a chance to catch up if they need it, to move somewhat at their own pace although I still have self-paced classes.

I mean, not self-paced. We work all together in step, but in the really good adaptive learning systems, the questions promote different learning information for students as they need it. So it meets their needs, it lets them catch up, it levels the playing field. We especially find it in the very large classrooms, especially the first and second year students, those gateway courses.

It is just a major game changer. And so that's why I wanted to attend this to see if anyone else has used any of the adaptive learning or thought about it even.

KIM: Thank you, Deborah. Yes, I'm kind of curious too to about number one, the adaptive tools that you're using and then what other folks might be using.

INETHA: Well, I do a little something sneaky in my class. I'll set a due date before the actual face-to-face class, knowing I'm going to give them the face-to-face class to work on the assignment. And what that does is I will call on students who I know have already submitted the assignment to come up and show how they approach the program.

They had to write on the board, and I will have them do it in groups of two or three, OK, what did you do different? Why did you do this? Questioning them. And this gives time for the students who weren't able to complete the assignment to work on the assignment and get some ideas that just didn't come to their brains while we're in class. And then the assignment closes at the end of class, allowing them still time to submit, even if it's just partial of the assignment. I know they got something done and they got some learning done.

KIM: That's very interesting. I think it allows-- It sounds like, Inetha, that it maybe allows some time for some reflection as well.

INETHA: Yes, because I'm asking them, why you do it, why did you do it this way? That may be a good idea, but maybe, did you think about this option? It may have been a more concise way of writing the program. What type of documentation? And it's just questioning them as they're putting their own programs up and giving time for students who didn't complete the assignment to complete it. So it's sort of a win-win. And then, I let them take pictures and also record the lecture if they want to.

KIM: That's a very interesting approach, and I think it really gets to some of the critical thinking and higher level thinking to ask, why did you proceed in this pathway?

DEBORAH TAYLOR: So, the program I use-- well, I use it for AMP and I use it for straight physiology. Excuse me, is the Mcgraw Hill program. It's changed in the past couple of years. It's called LearnSmart, and now it's LearnSmart 2. I liked it a little bit better in its raw form. I think it drills down a little bit more than I'd like it to, and it makes it a little harder. I have to make sure that I don't let the assignments be too big.

I worked with other faculty for a while, and that was the problem, is they just signed this whole unit and it was like, take forever and students would get frustrated. So, I try to say, you got to do it in little chunks, as we know. I didn't tell you, but my PhD is in educational technology. I moved out of the science for my PhD, because I love doing technology. And so one of the things I say is you got to chunk it. You got to make it so that it's a small enough assignment.

I've had good success at the university having the assignments due before class. And of course, it has to be worth points. Not a lot of points, but they won't-- they don't do it if it's not worth points. I'm sorry. Just they won't. You know what? The people who will do it are the ones who don't need it. I mean, the students who need it, they understand that the points are there and so they're more likely to do it.

I'm also a little soft on deadlines, too, but at the university I would have the assignment of what I was going to lecture on and have it do early enough. Because a lot of times, I taught it one in the afternoon and I would be able to go through and then find where the weak spots are and then focus my lecture by the group's weak spots. And then, also, I bring those questions in. I do interactive lectures, so I'd be lecturing and then we'd have a couple questions come up and the students would-- I'd call it vote.

We used clickers there. And so we'd vote. And it was really kind of fun to watch them when they were right. Yes, and then it was like a competition. And so they enjoyed that as well. I used some of the questions from the adaptive learning. So it's kind of a combination of, you've really got to be interactive. You've got-- and that adaptive learning, it keeps them engaged when it's done right.

I have used Pearson but it's been a few years so I can't comment, but I know they have something that's somewhat of an adaptive learning program. I used it several years ago for cell biology. It was more of an assignment area. But again, I could pick what they needed then I could guide them as needed. And we need to make sure that the backgrounds are there. Yeah.

KIM: Interesting. I find that very interesting. I know at my institution we use a lot of the Mcgraw Hill resources as well and have had a great amount of success. Is anyone using any other kind of adaptive learning systems? I know there's several out there. I'm just curious if anyone has found success with those.

ALEXIS KOWALIK: I use Pearson's and some-- it definitely seems to help for some students. I suppose with that, I make it really clear to students that homework is where they're supposed to make mistakes and learn. And I count anything over 50% as full credit.

KIM: OK.

ALEXIS KOWALIK: Just to make it very, very clear, you're supposed to make mistakes. I don't want to see perfect answers. Use this tool to learn.

KIM: Wonderful. I see a comment from Karen that says they've had a lot of success with Lumen Learning and OLI. I know at my institution, one of the things that we discuss is the cost to the students. And so that balance of having that adaptive system versus the cost. And that's something--

ALEXIS KOWALIK: With the electronic textbook, instead of having them get the physical textbook, it is a lot more affordable, where it'll be like around $100 instead of $300 or $400.

KIM: Right.

ALEXIS KOWALIK: And then, it links like to videos and it takes them directly to the textbook where they need it.

KAREN VIGNARE: Yeah, and I would say those two I just mentioned are generally between $25 and $50 a student. And there are a lot out there that are cheap. And then,

even OpenStax has a couple of tutoring systems. I think chemistry is one of them, but I'm not positive. And I also-- I recognize that people from different places here, but if your college works with either a system or whatever, you can also usually get pretty good pricing if you're with a larger organization as well.

KIM: Yeah, thank you for that. That's very true. Power in those numbers to help bring the cost down. I see Inetha said they use something called Ci books. And she said she liked the learning information provided. So, I'm not too familiar with some of these, such Ci books, but I think it's certainly worth looking into. And so I think adaptive learning, I agree, is a great tool. And it can really help students take a more active approach in their learning.

MEGAN TESENE: Yeah. Karen's already searched the two tools but APLU and ATD, we've done a lot around adaptive courseware implementation with colleges and universities, and seeing varying levels of success. And we found out that what really, really matters is the implementation of the tool and that it is paired with good old quality course design and instruction with an engaged faculty member.

So you can take a-- a tool has to be decent, but you can take a very basic tool and do really good with it, or take a really snazzy tool and not do much with it as well.

KIM: Exactly.

MEGAN TESENE: So that's what we've seen. But just a couple points I want to repeat what I've been hearing. What I think I've been hearing from folks is thinking about, cost and accessibility. Whenever we're talking about any technology, we want to integrate into the classroom, whether it's adaptive courseware or some other learning technology, and thinking about how students experience that.

Whether they can access it, whether they can afford it, what that looks like in the classroom, across different types learning modalities and platforms, things of that nature. Learning styles and things of that nature to making sure you have flexibility for your different students who learn differently as well.

So I just wanted to raise that point. And then the other thing I think I'm hearing from folks is the ability to do a student-centered instruction approach by using the information that you're learning about. How they're engaging with their homework, how they're learning to provide that, what we call that more personalized instruction to the students and within the course itself.

KIM: And I just want to comment. Inetha was kind enough to share a little bit more about CI books. And so she said they offer computer science and math textbooks and are quite affordable for students and very flexible for instructors. So that's helpful information, thank you.

One of the earlier comments that I didn't get a chance to talk about much that was put in the chat was, Jennifer had said, learner-centered in STEM includes applications to real world situations and career pathways. And that is something that we wanted to talk about in the session, kind of that global level engagement.

And so, Megan, if you can scroll down on the document, certainly our disciplines and courses are never completely removed from the real world and can often play an important role in the content we cover. And I was just curious how you help create a space for students to explore the world around them through the lens of the discipline that you teach.

DEBORAH TAYLOR: I try to use some of the HHMI resources. The Howard Hughes Medical Institute offers a great resource of biological resources that are collaboratively made by faculty, and they try to hit on emerging issues in our world. And so, I think that helps for them to see what else is going on. Trying to think what else. But I think those are really good resources.

KIM: The HHMI has some wonderful activities. I know in my microbiology class, for example, they've got a sample drug regimen for someone with HIV. And it's easy to say take a pill twice a day, but the activity has students kind of taking a tick tack twice a day over the course of two weeks. And it really allows students, I think, to get an understanding if they've never had to take a medication, how difficult that can be. And so, yeah, HHMI has some wonderful, wonderful tools.

DEBORAH TAYLOR: Yeah, I got to help create one of their resources. And this is in the biointeractive or bio-- yeah, that's biointeractive. And we looked at testing for hormones when we're looking at participants in athletics. And that's a pretty-- that was a pretty hot topic, too. Ours wasn't quite as hands on as yours. I like the idea of the pills. So that's pretty cool. Yeah.

KIM: Yeah. Abby wrote in the chat, as a study tool, she asks them to think about how what we learned that day they see in their life that day. This way, they see how what we learned is related to the real world, but also for their life itself.

Wonderful. Yeah, I know-- again, my experience being in microbiology, sometimes if we're talking about a particular pathogen, we will focus on a particular area in the world and discuss how life might be living with that pathogen or some of the infection control measures that might need to be taken, all of those types of things.

INETHA: In computer science, we do a little different. We look at programs that other people have written, and we have students debug them, find out what the errors are and to correct them. And sometimes it's not even by truly correcting it, it's by what would have been a better practice, especially with all of the cybersecurity breaches. What can we do to write our programs to be more secure?

So those are how we bring in real world activities, because right now, with all the security breaches, they have to learn how to write a more secure program and a program that doesn't give opportunity by being excessive for a hacker to be able to find a whole bunch of, what I like to call, Googly Docs, where they just put a whole bunch of stuff that really doesn't do anything, and a hacker can come and put their code in there and nobody will know, because no one understands. So we really work hard on them writing concise programs that are written in a secure manner.

KIM: What a neat approach to really pull in that real world, I guess, hacking and that real world situation. That's a really cool approach.

INETHA: We try. We're small, but we really try.

KIM: I mean, I can see how that really would be relatable to the students, because I think we've all unfortunately had that experience at some point.

INETHA: Yes.

JENNIFER HOWZE-OWENS: Can I ask a question to expand this topic a bit? I'm wondering because I think these are really, really great applications. But I'm wondering, I guess, the community aspect of it. So how do you all in your classes, also, are these individual-- are all of these individual assignments?

Are you kind of working in groups or how do you expand this into maybe even building community or even respecting-- like Kim, you were just talking about in your microbiology, someone who would need to take a pill twice a day. Like, how do you expand it to building community in the classroom, whether it's through projects or even considering other perspectives and so on and so forth?

INETHA: I guess for me, my students have to work together when they come in on the first day of class. And I don't call it group work, because it frightens them. So I'm like, y'all going to work in teams. And what does that mean? That means whoever is sitting next to each other, you're to help the person next to you if they don't know something. If you don't know something and they know it, they're to help you. There's only one of me. And like I say, I'm from a small college.

We're in Texas in a small town called Corsicana. So my classes are about 10 to 20. But I tell them there's only one of me. There's 20 of y'all. You can help each other better than I can help you. Save me for the big questions. Save me for the questions on, I don't understand how the class is running. I don't understand how my grade is. I don't understand what I did wrong with this problem. But when y'all are in class and you're sitting next to each other, help each other.

Because when you get out in the workforce, that's really what happens in computer programming. It's really one person on a program. It's 2, 3, 4, 5. You may be at the same company. You may be at different companies. You may be sitting in a cubicle next to each other. Y'all may be all working from home in three or four different countries. We don't know.

So, we try to get them used to that idea that this is not about memorizing everything. You can't memorize all of computer science. It changes too quick. It's about you asking for help, learning how to do research, and applying what you're learning.

KIM: I think that's great. I'm just going to add that Jennifer chimed in the chat that she said she has students collaborate to annotate a case study in each unit. She uses a program called Perusall that is free for students and instructors that links to the LMS. I'm not familiar with that program, but it sounds like it's a great way for students to get active and then annotate and work together.

DEBORAH TAYLOR: I think it's been really hard. This past semester was the first semester I went back to face-to-face, and because I always like to do think pair shares. Like, I'll explain a difficult concept and then they have to explain it to each other and I work the room. And then depending on the class if I have TAs or whatever.

Size of class makes a difference. And that's a little harder to do online unless you're actually meeting at the same time. If you're asynchronous, it's very difficult unless they make appointments, but by them explaining to one another and sorting the process out,

they understand it. I always tell them, you're going to understand something better if you explain it to someone else. And so I just do the same. Whoever's sitting beside each other, that's your partner. I say, turn to your partner. And it takes a couple times for them to get going, and then you can't shut him up. But, they'd like to talk and that keeps the class active. So it's been very hard, though, because people have masks on. It was hard to hear. And for-- we're doing physiology.

You may not want to do someone's blood pressure. I mean, we had some really hard times. And so that made it a little more difficult. We did do some lab work that-- we could do things that you didn't have to do hands on hand. For EKGs, I ended up actually doing a demo and everybody in a couple different groups, because they just didn't want to get all crowded around one space. And so, it was-- and we wore masks the entire time. And so as part of our community, the other thing I did was we voted.

The school went to where you didn't have to wear a mask yet, but I had a couple high risk students. I had a young woman who was nine months pregnant. She was ready to deliver when that happened. And we took a vote. I mean, we did a consensus, basically. I said, what do you want to do? And so by letting them build the community and making the rules in the classroom, that really empowers them too.

I told them I can wear mine. I will wear mine. Maybe more than you, who knows? But it was, again, to make a community, they have to feel like they're part of the making the rules. And I think that's not always easy for us to do, but what is it? Guide on the side, not sage on the stage. Attitude is so critical. And so I really think that it has been really hard though in this pandemic. And It's not going to change.

So the other thing I did is I made my class flexible. Everything was on-- lectures were live. They were on Zoom. And if they couldn't make it to class, they could do lecture. They didn't-- I had a little trouble with the clicker questions from the online. I've still got to perfect that little technology, but it gave them the flexibility that if they didn't feel safe coming in that day, or if they couldn't because they were in quarantine, they didn't miss out. And I think that helps too.

KIM: I think that's some important points. One of the things I'm finding that even in face-to-face classrooms now, there's still a large online presence for a lot of my classes. And so, to further Jennifer's question, I'm curious how folks build that community in the online environment.

I know one of the ways I do it, and I think it was talked about in the last session, was doing that GIF check in where just even, how are you feeling? Share a GIF or a meme. Sometimes even just doing a thumbs up or something like that is helpful. I also do like a course, I call it my class cafe, where students can just pop in and ask other students' questions as a discussion forum, but I'm kind of curious what other folks are doing to help build that community in the online environment.

KAREN VIGNARE: You have a few things comments and related that, yeah, I definitely have used discussion boards a lot for online. One of having students do an introduction post that includes where they have to update an avatar that it doesn't have to be them, but something that will be representing them so that they're not just a black box. And then also having a very early assignment. Again, with a discussion board where I direct them to a website.

Since I'm chemistry, it's from ECS, of having something that's at least a little bit structured of, OK, pick what topic you're interested in. Pick an article from that topic and then read and share the article. Summarize it. You'll talk about why you picked it. And then there's always a requirement to respond to at least two classmates that that's part of the points. And then I actually started revisiting that first assignment at the end of the semester.

Go back and read your article again and reflect how much better do you understand it now so that they can really see how their understanding has grown on something they said they cared about from the class. I have also done very similar to what Deborah Taylor talked about, of adopting a more flexible model that, even when my school returned to in-person, I felt very strongly that not everyone feels safe to be there, and not everyone-- things can come up.

So I made it-- or similar. I did a flipped model where they were watching the video separately, and I used the class time so that where we would play review games. I really like Quizlet and Blooket for that. I know other people use things like Kahoot! And Mendy. So, Deborah, that could be a good alternative to your clickers, because then everyone-- whatever device, computer, anything, they can use it as a clicker.

And yeah, I have, sometimes, students just show up for the games and then leave, but at least they're showing up and doing stuff and reviewing. Pearson does also have an embedded thing that can also be done live with questions where it's not just multiple

choice. They can draw a picture or circle something or highlight something as a response.

So yeah, I've used that successfully. And then, yeah, trying to do more group work during the class time where I'll have the people that are there in person work in groups, and then I just treat the online people as another group, where they're working together online, and then it's just visiting the computer in the room for the online people just as if they were another in-person group so that I'm still cycling between the groups and giving everyone time and assistance.

KIM: I love those ideas. And I do something similar with having students read a paper that is of interest to them. Sometimes, also, I ask them to find a scientist that looks like them that's on that topic. So really trying to pull in that they have a place and a belonging in the STEM fields.

Inetha shared that she does a Zoom check-in with her students, where she requires video and audio every three weeks. The students are able to choose the day and time for those check-ins. So that's interesting. I'm curious, especially Inetha with these check-ins. Do you ever have students that don't check in? Sometimes I have students that just kind of disappear and almost, I guess, the term is ghost. Does anyone have

[AUDIO OUT]

JENNIFER HOWZE-OWENS: Is she frozen?

DEBORAH TAYLOR: Yeah.

[CHUCKLES]

JENNIFER HOWZE-OWENS: Inetha is eating a snack.

[CHUCKLES]

MEGAN TESENE: All good. Yeah, I'm showing Kim. Unfortunately, it's frozen, but I can infer what she was going to ask, because she was going to see if anybody else, kind of running into that situation where students aren't engaging in the ways that you designed to account for that. And how do you deal with that?

DEBORAH TAYLOR: Points.

[CHUCKLES]

Students will do anything for one or two points. No, just about. No, I mean, but really. And so sometimes it's extra credit points for some of the things. For that would be-- if I required it, it would be, OK, you have to have this many. Now, to be honest though, there's a little flexibility in the points. OK, so it's like, all right, there you could probably

get 45 points maximum. But there's an ability that if they do them all they get the full 45 points. But it only counts as maybe 30 the gradebook so that there's just that little bit give there in case something's going on.

For instance, I mean, I had a student who had long COVID really bad. And there was about two weeks where there was just nothing she could do. I mean, she was pretty well down. And maybe it was active COVID and then it went into long COVID. And I kind of kept working with her and she caught back up finally. But she couldn't have done all those check-ins because she wasn't able to. And so, I think that's the other thing we have to keep in mind is that you can offer points, but also realize there may be reasons. And so the other thing I do is touch base. What's going on? What can we do for you? Do you need anything? And so I think that's the other thing we have to think about is, I just don't know they're going to do check-in if it's not worth points.

JENNIFER HOWZE-OWENS: I think it also depends on the program. I have worked with a nursing instructor, and because it's a certified kind of governed program, these students and it's many moving parts, and the way she runs her class, I noticed that she required at least one class meeting. And I asked her why? And it's one, because there's so many moving parts to her class, the nursing program. And I think they're building community is a major part of what they do. Something else I asked of a math instructor, even though he sometimes office hours are so many, sometimes you have the opposite effect of so many students wanting support. So he kind of makes kind of a separate study hall or have students, if it's maybe cross courses, helping others. And so just making the best of the time together. If it's make it, maybe a study group if it's not a required meeting. And those tend to be ways to also hear from students that you otherwise may not have heard of what's going on in their lives.

MEGAN TESENE: We've certainly seen, I think-- and welcome back, Kim, we just kind of kept chatting and figured you'd make your way back to us.

KIM: Yeah, sorry.

MEGAN TESENE: Yeah, no problem. Especially over COVID and everything that happened, it was just like, everything was an emergency for everybody all the time. And we have a lot of strategies and tools and things that were available to us, but not everybody was using or thinking about, how can I provide the most flexible learning environment for my students in this crisis? And what we've seen from the institutions we've worked with is a lot more faculty having gone through that process, learning new

things, but also thinking to themselves, why wasn't I doing this before? And carrying those practices through now that we're presumably moving out of this.

Fingers crossed. At some point, but again, thinking about this really student-centered, what does a college or university or classroom experience look like when you are centering your students' needs? What does that do to influence what design choices you make as a faculty member? And I wasn't posing that question. I guess I was just speaking rhetorically. Sorry.

[LAUGHTER]

Kim, I'll go ahead and hand it back to you. I know got about four minutes left.

DEBORAH TAYLOR: But can I say one thing?

KIM: Absolutely.

DEBORAH TAYLOR: I mean, my students-- In 2020, my students already had the background. They were already doing the adaptive learning. This was a face-to-face class, but they still had to go into campus. They had to-- that's where the assignments were. That's where our communication was. And so when we went into lockdown, they were ready.

The only thing they weren't ready for was the virtual meetings. And so that worked out really well. So, it's nice to have that flexibility. I would recommend everyone to build that into their class as soon as possible, because as a biologist, I'm not sure we're done with this thing. And so I think we need to be ready. OK? All right. Sorry, Kim. OK, I'll shut up.

KIM: No, I agree. And I think that's a helpful tip. Alexis posted in the chat that she's really surprised at how many colleagues want to go back to the inflexible before times as well. I guess in just the last few minutes I wanted to ask, how do you foster some of the meaningful discussions with your students on some of the larger global and social issues that your discipline brings into a conversation?

INETHA: I think that's a hard question, especially in my field. It is so hard to get my students to understand that their programs can affect someone's life. I have a question in my lower level classes where I asked, who should be responsible if an employee steals emails and make them public on the internet? And they're like, the company's responsible. And I'm like, well, what about the IT person who did it? And that gets them. And then I have another one. Programmer developed the program to help a doctor with surgery, and the program had bugs, and the programmer decided to send it out anyway,

thinking getting it done quicker instead of perfectly, and someone dies. Who's responsible? And it's hard to get them to understand that what they do as a programmer actually affects someone's life. All they see is the code. And that's the hardest part, being in a discipline where everything is still sitting in front of a computer and they don't interact with the people that they're affecting.

KIM: Yes, and Jennifer chimed in that ethics is a topic that should be investigated. And so I think that's true really across any of these disciplines, being able to see the repercussions of some of the work that's being done. We are just about at time.

And so I wanted to thank everyone for the great discussion, and for joining in the conversation with me today. I'll put in a plug for the last session. I think Megan is going to be leading that discussion, talking a little bit about some of the instructional design and strategies that can help foster equity in the classroom. So, thank you all for joining us today.

MEGAN TESENE: Thank you all so much. Hope to see you in about five. Take care, everybody.

KIM: Thank you.