Episode 1- Human-Centered Teaching in the Age of AI (with Dr. Julie Chamberlin and Dr. Michael Burns)

Hi, and welcome to our podcast. Teaching and Learning at LUC. We are your hosts. I'm Bridget Colacchio. And I am Polina Pine, streaming to you from Loyola University, Chicago. We love teaching, and we are excited to introduce you to our colleagues from Loyola. And from around the world who study their teaching practices through SOTL, the Scholarship of Teaching and Learning. Thanks for joining us for today's conversation.

Bridget: We are very excited to have two of our colleagues with us today for a conversation that has more of an intended topic than other conversations. We invited these guests to be with us to talk specifically about artificial intelligence and teaching and learning. We're really excited to get that started.

Polina: Thank you, Bridget. And welcome, dear Julie and Michael. So, Dr. Julie Chamberlain. is an advanced lecturer in the English department at Loyola University, Chicago. She currently works with FTIP, which is Faculty Center for Ignatian Pedagogy, as the faculty scholar in assignment design. And we are excited to learn from Julie today. The other respected guest is Michael, Dr. Michael Burns, who is an Associate Professor in the Biology Department at Loyola University, Chicago as well. Michael does an amazing job in teaching, learning, and has very strong ties with different pedagogical approaches. Welcome, and we're excited to have you as our guests today.

Bridget: Thank you both for being here. We would love to just maybe ask you to kind of... take a stab at how it is that you have come to be what we consider in our community at Loyola, maybe the beginnings of some experts in artificial intelligence and pedagogy. Can you tell us a little bit about how you got to that place, and we'll dive into what it is you're doing a little bit later.

Julie: I can kick us off. So, I have been teaching in writing in English departments for the last 10 years and admittedly have had just used chat GPT for the first time about a little over a year ago. And I had not yet I had heard about AI up until that point, but I had not used it myself until I received two strange assignment submissions that I just could not figure out what was going on with them. And then it dawned on me that this new AI thing that everyone was worried about could be popping up in my students' work. So, since then, I personally am someone who loves to learn about new technologies. And I will say my bias is more to figure out how to embrace the

technology rather than to try to shut it away. So once I realized it was out there, I did start playing around with it myself, seeing how I could integrate it into the classroom as a learning experience and also, I mean, mitigate the potential for CHAT GPT to be used in ways that we as instructors do not want our students to be using it. So, the following semester, I had my students in first year writing start out writing a response should AI be used in the classroom. And I gave them two articles to read. One is a New York Times article arguing for Don't Ban Chat GPT Teach with It by Kevin Roos. And the other article, I'm going to forget the authors off the top of my head, but it is about the potential for AI to encode racist biases from the programmers. And so, I give them these two perspectives and ask them to respond to the question as a kind of diagnostic essay at the very start of class. So, we address it right away and have an open conversation about what AI can offer, but also what the ethics of using this technology are, especially if we're doing research writing. My class has a social justice theme to it and first year writing. So, talking about also, if we're concerned about social justice, what sort of concerns do we need to be bringing into our use of AI? So, it has been a little bit of a stop and go with all of the new things coming up. The Grammarly extension has been thrown before a little bit of a loop again, but I honestly feel like, oh, we've got. My cat's joining us. I feel almost kind of excited about the reckoning, the opportunity for a reckoning that it offers us, especially in writing. And even though it's going to be hard for instructors to redesign things, to incorporate this new technology, I ultimately think it's going to get us thinking critically about what we actually want our students to produce. Is it some rote, standardized academic English, or is it something that they can produce creatively? Or can they interact with the text that they're reading or the content in ways that does not simply mean regurgitating information? Of course, that means more work for us as instructors. So that's something that I'm trying to do as a faculty scholar in assignment design is figure out ways to help faculty with creating assignments and activities for students that they can then integrate into their classes without the pressure, necessarily, to learn all of this themselves.

Bridget: Excellent. Yes. That's really great. Thanks so much. Yeah, go ahead, Mike.

Michael: Yeah, so it's a weird road for me. So, I'm a biology professor, but my specialty is computational biology. So, I use machine learning models to analyze sequencing data sets from primarily cancer patients. I'm familiar with the statistics and the underpinnings of a lot of these things, although I don't work with language models because I'm not doing that language of using genetic data. But as somebody who is adjacent to these spaces, I think two years ago, two and a half years ago, something like that, OpenAI had released a model called GPT-2, which was the second generation of GPT before it became ChatGPT. And people were poking around at

that. And it was able to do kind of simple stuff. There was a text-based game that came out called, I think, AI Dungeon, which was interesting because it was an implementation of an artificial intelligence to make a game. And it was funny because it was terrible. It was awful. Like you could totally play it, but it would go completely off the rails. And then shortly after that, they came up with GPT-3. So GPT-3 came out and they made a public-facing workspace. It was called the GPT-3 workspace. And you could go in there and you could ask it stuff. So, it wasn't chat GPT yet, because you couldn't have a back and forth. You could just sort of give it one prompt and then it would give you a response and you give it one prompt and it gives you a response. And one of the first things that I did with it was I'm like, well, this can generate text. I wonder if it can just, you know, just ask it a question, write me an essay about Plato or something, or tell me about CRISPR. And it could spit out something that looked reasonable. I mean, it wasn't perfect, obviously, but you're like, it was doing a lot of work, like way better than other things could. I'm like, oh my God, this is going to upend everything. Like people, especially in the English department, should know about this type of stuff, right? And at that time, I was working with a colleague of mine in the philosophy department, Joe Vukov, and we were updating a course that we had taught across biology and philosophy. It's this giant six credit monster where we talk about science topics, and we tie them back to philosophy. So we had previously talked about artificial intelligence before GPT-3 or ChatGPT had come out, but this time we actually baked it directly into the course. And so we went over the mechanistic. So I was able to talk about the statistics for how machine learning models operate, how deep neural networks are built, what the training data sets were that people used, and then we gave them assignments. And the assignments were literally sort of echoing sort of what Julie's working on as well, which is like, should you use, should you use an AI model? to assist you in your coursework. And we actually have the students give that prompt to the AI and then we have their assignment is actually reflect on whether or not the AI is like, is it, do you agree with it? Do you disagree with it? Why or why not? Okay. So that was our first foray into this. I'd given some, I gave a very brief announcement in our biology departmental seminar a while back, but this was early enough where people were like, whatever, it's some fad, whatever, who cares? And then the next year, ChatGPT came out and it sort of blew up because it was a more refined model and so forth. We were continuing to teach it. By that point, I didn't just bake it into this interdisciplinary weirdo course that we were teaching. I started using it in my sophomore level cell biology course and in my bioinformatic courses that I teach because it turns out that these language models are also incredibly helpful if you want to learn how to do computer programming. So we use it for computer programming. Microsoft has their own version called Copilot, which they have baked directly into GitHub, which is sort of like the main repository for

programming. So it's, in that context, it's not even that like, the question is like, is this going to be important if you go out in the real world and do programming? Like it is a standard tool that you're expected to know how to use when you go out into the workforce. Right. So yeah, so it's basically baked into everything at this point. I think that the real challenge now, and I've been on a, like, again, I think honestly, not because I'm an expert, but I think because I got into it early enough, people are like, oh, this guy knows what he's talking about. I'm like, okay, I don't know. I feel confident that I know what I'm talking about. But I've probably given, I don't know, 10 talks this year to a variety of groups on artificial intelligence and pedagogy. And a lot of it is, it's not. whether you should or shouldn't use it, that's going to be up to whatever the individual instructor sort of thinks about it. But I've got a pending grant out right now, which is there's not going to be, I mean, there probably are going to be some universal best practices that you can apply to AI, but more realistically, there's going to be just this cornucopia of field-specific considerations that you're going to need to figure out with relation to AI and pedagogy, right? Like what does AI look like when it's being implemented in an English department, in a programming class, in an art class, I mean, whatever it's gonna be. And I think it's gonna be interesting to sort of see what that looks like. And my hope is that we're able, again, at Loyola to put together some sort of a task force to do these types of things.

Polina: Yeah, that would have been amazing. Thank you, Julie, thank you, Michael. I remember it was last year or a few years back. In one of them, Loyola teaching conferences, focusing on teaching and learning, Michael gave an amazing talk together with your colleague, Dr. Vukov. You gave an amazing talk about using AI, and specifically ChatGPT. And it brought a lot of interest to your talk, because it was hands-on. So, you gave us a link. We had to do some sort of assignment. I was one of the participants and I enjoyed this particular activity a lot and the talk that you gave. And since then, I've been interested in more applications. And if we can talk a little bit today with Julie, with Michael, about how specifically you use ChatGPT in your classes. And I'm really happy that we have Michael from the science perspective and Julie from more humanity perspectives because again, many people in humanity, they are against using shared GPT just because it's so easy to at this point right now, right, to fake the actual work while in sciences, it's more debatable, I would think. And this is my personal opinion. And I want to see what you think about it.

Michael: Well, I guess I'll start off very, I don't want to go on like long tangents or anything, but I will just say like in terms of utility, like every day-to-day use in class, ChatGPT itself has evolved, right? So, the talk that I gave a year or two years ago or something like that, almost

everything that we talk about there that's related to the AI can do this. It can't do that. That's all wrong. Like it can do, they can do a lot more stuff. Yeah. Yeah. So, if you get the paid subscription to ChatGPT through open AI get GPT plus, what you get access to be the fourth-generation model which is better at some things worse at some things. But more importantly, what you get is you get full access to the multimodal AI, right, because that's the new pivot that they've made. So, one of the critiques that you've heard of like GPT three or ChatGPT in general is that you can't do math. And that's true. It can't do math because it's a language model and the language model are not trained to do math. That's not what it knows how to do. The way around this problem is not to like, oh, we're going to train GPT-5 and GPT-6, the seventh and eighth generation. They're going to figure it out. That actually would never work. Like, no matter how good you get your language model, it's never going to know how to do math. So, what they've done is they're like, well, instead we're going to train a completely separate AI. And that's the data analysis module that's baked in. And the data analysis module is sort of shoehorned together with the language model. So, when you ask the language model a question that looks like math, it says, ah, I'm not going to look at the language part. I'm going to shift over and start running some Python on the backend to actually do math and do statistics and things for you. It can make charts and graphs. It can do all sorts of cool stuff too. So, if you teach like a physics laboratory class, for instance, students could literally crunch all the numbers and generate all the figures using ChatGPT, like that's that with the full version, right? Cause you need the multi-module, multi-modal version of it. It also has Dolly3 built in. So, if it can generate figures and all sorts of stuff from text, which again is not part of GPT-4, it's this other module that's attached to it. So that's where the new power is. That's what's important about it. What I've used it for in my cell biology class, is I quiz the crap out of my students. So, I do the quizzes every week and I give them practice questions, but a lot of them are still hungry. They're like, we need more practice questions. And I'm like, okay, well, I'm not gonna give you like 500 practice questions because that's insane. But what I can do is I can say, I'm gonna demonstrate for you. Here's the GPT. I can take a scan or an electronic version of the chapter of the textbook that we're talking about. You can drag and drop it into ChatGPT and then have a back and forth with ChatGPT and say, can you ask me questions about the content that's in this chapter? And it does.

Polina: Oh, that's an amazing idea. Yeah, it does a reasonably good job. It's not perfect, but again, if you think about it, like, well, what if this was just like a study partner? Right, like instead of having somebody else like, like one of my buddies that's in my class with me, we go to the library or something, that would actually be better. I encourage students to do that. But if they

can't, if they're just like, I'm by myself and I don't have time to schedule stuff, you can absolutely use ChatGPT as like a study partner to go back and forth. So that's what I do in cell biology. In my upper-level courses where we're going through primary literature, you can kind of do the same thing with primary literature. You can basically take a scientific paper, drop it into ChatGPT, you read it yourself, and then when you get stuck on like a paragraph, you're like, I have no idea what this technique is. Like, you know. What's the difference between HPLC-MS and is that the same thing as HPLC-MS-MS? Like what are these, what's this lingo? What's this, what do these acronyms mean? You can just ask it very quickly and because you've restricted its sort of workspace to this finite piece of content, you're gonna get much more accurate relevant answers than you would if you were to just sort of like ask the model in general. just based on its entire training data set.

Polina: And you're talking about the next generation GPT and ChatGPT-4, right?

Michael:Yes, yeah.

Polina: And have you tried to test different platforms such as Gemini or I don't know, versus ChatGPT-4?

Michael: Yeah, so I have, I've used, so Gemini is the new one from Microsoft. I think it's a rebranding of Bard, if I remember correctly. I used- Yeah. I used Bard when it first came out and it did a lot of the same stuff, but it also was like super-duper weird. Okay, so I think it wasn't quite as polished as OpenAI's model was. I think the thing that Bard had going for it in the early days that ChatGPT didn't, although the GPT-4 has fixed this as well, is that Bard initially had full access to the internet. So, you know, it's not training in real time or anything, but when you ask it a question, it's using its training dataset, but it also has access to go like, it can bing things, right, to sort of figure out what the responses were. At the time, ChatGPT did not have that ability. It has that ability now. So oftentimes, if you want to, for instance, if I'm like giving a talk or something and the organizers are like,100-word biography of yourself very quickly. Sometimes what I'll do is I'll just go to say like, look at my website and look at my publications, here are some relevant URLs, throw something together for me. I use that as a starting point and then I will sort of tailor it to my needs. But because it's got access to my publicly available public facing data, it's just a useful workflow.

Bridget: Yeah, that's so interesting. And I think that having, and maybe this is a note to us to offer a couple of resources even in the description of this, for just an introduction to some of these things, because I think that we're already probably surpassing the maybe not comprehension, but exposure that some people have had to AI as it is. So, we can think about maybe putting some resources into the description so people can familiarize themselves with some of this. But for you, Julie, I wonder, you know, in thinking about the ways that you are applying some of the specific examples from your discipline. And I also want to just tug in one of the maybe tensions that I feel like you introduced when you first were introducing yourself is this idea of kind of embracing versus rejecting these tools. And so, in that vein, what are some examples from the work that you're doing?

Julie: Well, I think the reaction from the humanities community anywhere where the main way that we test students' skills in classes is through written work. It has been scary. And I also want to just say that I empathize with instructors, even listening to you, Michael, going through the ways that this technology is constantly evolving and getting better. And I get it that a lot of faculties look at that and say, I don't have the time to learn this myself. And I don't necessarily know how to use this. So... that makes it harder to recognize it in student work or to have these conversations with students because it's not your discipline and it's not something that you personally are familiar with. So,, it's hard to teach with AI if you don't know AI. So that's a real challenge that I think the humanities world and maybe also the sciences in a different way is gonna have to reconcile with. But some of the ways that I have made it perhaps a little bit easier is actually kind of learning along with my students in the classroom. So I'll have them do an assignment, for example, in my business writing class. I tell them, you know, in the business world, not only might you be able to use this, but there might be circumstances where you're encouraged to use AI to help you in the business world. And I've also spoken with students who are English language learners. And I say, you know what, there are just some idiomatic phrases in English that have entered business jargon that there's not really a reason that I can give to say, this is why this expression is appropriate. And this expression, this sounds awkward or this sounds too direct. You just have to get into the practice of it. And I think the potential for something like AI to help English language learners recognize those idiomatic phrases and pick out how they could phrase things in a more quote unquote professional way, at least as perceived by the American corporate community. I think that's a benefit to it. So, I have my students ask ChatGPT to do different props for things and we prompt it together in class, see what it comes up with, and then we critique it. And when I have it do cover letters, a thing that comes up is that ChatGPT actually does a really good job of providing structure and formatting.

And if you give it a job application, it does the work of picking out what the qualities are, both soft skills and hard skills that the employer is looking for and building them into the cover letter. So, I actually think there's a good opportunity to have a template there to work with. But what it doesn't offer is that human component to writing that, and I think we're starting to recognize now what AI type writing sounds like. It's very formulaic and I think it's almost started, we're starting to devalue that in certain ways. We can recognize it and now we see it as being less of a, oh, you can talk the talk. And instead looking at it as, okay, there's actually less substance behind some of these things that are posturing at academic speak or business speak or whatever genre you're at prompting it to write in. So In that way, we look at the utility of AI, but also its downsides. And I always stress to students that it depends who your audience is. If you want to write out a piece of copy for a website, and you're in marketing, and a copywriter, and all of these websites, templates that you're designing just need copy to fill in them, well, then I say, why not use AI to help with that. If you're writing a personal statement to get into law school, that's a circumstance where I think AI could hurt you. Because it's going to strip it of that essence that makes you unique and you're going to sound like just one of the masses that could parrot back to the people who are reading this what it thinks that they want to hear. And that's not going to give you the opportunity to stand out in a positive way.

Polina: I have a question. Oh yeah, sure. I have a question as a, the person who have never went to any school as a student here in United States, and of course all the writing for me when the ChatGPT has appeared and other AI were available for use, it's a huge help for me. So, I'm wondering, and I don't really understand the differences in just even in the regular one-to-one conversation. So, for me, it's just interesting. How can you tell the difference between human-written text and AI-written text? And whether, let's say if I write a personal statement for medical school or law school, and then I would use the help of the of the artificial intelligence, whether it will be a help for me or actually it can hurt my personal statement. Could you please elaborate on this?

Julie: So Michael, correct me if I'm wrong on the technology here, but my understanding of how something like ChatGPT works is it assesses the statistical significance that certain words will be paired together in certain other places on the internet by aggregating all of that data of all of these other documents that it sifts through. So if you're thinking about a personal statement, if it's taking the aggregate data of however many personal statements it has access to and can identify as such, it's taking the words that are most likely to be placed next to each other in the circumstances that you are prompting it with. So, what that means is that for idiomatic phrasing,

consider it idiomatic within that genre. So if you, as a English language learner, that's something that you don't necessarily have the ear for, I think it can be helpful in that way. However, you're also getting a letter that is quite literally the most statistically likely to have been produced. So it is also going to not stand out in a positive way. And I think would require a lot of revision in order to make it sound personal to you or to make it stand out in a positive way because it is producing things that by design, whomever is well acquainted with that genre is going to have seen before, potentially many, many times.

Polina: That's amazing. Finally, finally, I get this scientific explanation. I've got many, I have gotten many explanations to this, but it still didn't, you know, fill my gaps in understanding. Thank you. Thank you.

Bridget: Yeah. And it really does speak to what another team and I were working on some things around artificial intelligence and academic integrity talking about AI literacy and how there really is a need for us as educators to be developing our AI literacy, but then finding ways to bring our students through the learning that's required to not just the skills, like what are the prompts that you might use? And as you were saying, Michael, how do you narrow the model by providing the content that you want it to consider, but then also the critical thinking skills related to the decisions required to use AI. Not just, I mean, we can talk about ethics, and we can talk about people's sort of values as it relates to this, and then there's practicality and an impact. sort of the outcome that somebody is attempting to achieve by using AI versus where it's actually going to lead them. That there's all of these sort of decision points that are required and I wonder if you've given that any thought in what you're doing that we all have this content, our discipline, that we are responsible for helping our students to learn within these disciplines and yet here's this pervasive tool that we also are going to need to be thoughtful about our role in helping to our students achieve AI literacy. What do you think about that?

Julie: I think if I could just hop in here with one like little quick example. I had a student turn in a cover letter for my business writing course that I could tell was written by AI and I kept using this phrase like as a well-seasoned professional in my field and responded to the student like, are you a well-seasoned professional in your field? And the answer is no. I was like, so this is actually a point where you need to be reading what it says and thinking about, does this actually reflect my situation? Because if not, an employer is going to see those gaps and say, well, no, you're just coming out of college. You are not a well-seasoned professional and it's actually gonna have the opposite effect that you were hoping for because it is making these judgments

about you that are not correct. So, I think it also is an opportunity for critical thinking in that way that what it produces, you have to think critically whether or not it's useful. Sorry, Michael, go ahead. No, no, no, no. I'm sorry.

Polina: I have to pop into it. It makes me laugh because as the person who's English language, not even second language. I would maybe just add the word as a future well-seasoned professional. Yeah.

Michael: So, Julie, you crushed it when you were describing why AI writing does oftentimes stick out as like kind of weird. And yeah, it's, it's the big breakthrough that they made was the transformer model. So GPT generative pre-trained transformer. The transformer approach was published by Google back in 2017, and its sort of at the core of a lot of these language models. And effectively, all a transformer is, is it's a way to go to make predictions from a large data set that doesn't just connect like this word is followed by this word, but it's this word is followed by this word and this paragraph based on this huge thing. So it's able to connect the dots statistically between very large bodies of work. Yeah, so it's super cool. In terms of challenges. I think the big one is that there's a major difference between how people who are professionals who are using AI in their professional career use AI versus like what a student might use AI for, right? So the the stats that came out there was a Nature study I think last year so it's even even now it's getting kind of long in the tooth but Nature, the big publishing group, did a survey of professionals and they said that 30% of professionals as of last year were using AI to assist in writing grants and peer reviewed publications. Which is a lot, okay? And so if you're like, oh my God, it's all AI written. Yeah, well. Yeah. To temper the panic that might be there, I think one thing that does stick out is that I think we're up to at least a dozen papers that have been published in the peer reviewed literature that they have caught using AI because it was really obvious because it says like, I'm just a language model, but here's an introduction for your paper. And then it somehow slips through past the editor, which should be a giant black mark on the editors. But more realistically, if you're a professional who's using it, you're using AI to do stuff that you're like, I know how to do this, but I just don't feel like it. Like I already know how to do this, right? So do I need to write the abstract for a paper because it's the very last thing that you do. So I've written, I've written up all the results, I've written the introduction, I've written the conclusion, I've written the discussion, I just need an abstract. You can feed the AI all of that information, say, summarize this in a 300 word abstract, and then you as the expert read it and you say, that's right, that's wrong, that's right, that's wrong, let's clean it up and make sure that it reads properly. I think that's a perfectly reasonable, responsible use of artificial intelligence.

You're basically using it to sort of speed things up. But the point is that the product is the thing that matters. It's not the process. And the opposite is true for students. Because for students, while we care about the product, the product is just like a proxy for, did you learn how to put this thing together? Absolutely, right. Yeah, and if you used AI to do it, you didn't. You actually shot yourself. You shot yourself in the foot by having AI do the thing that I'm trying to get you to do, right? Like, you... And so, the challenge becomes, and Julie, this is why I'm super interested to hear what you're working on is like, if you're teaching writing and like the AI can just do the writing for students, it's like a direct competition with what you want the students to do. Like you want the students to be able to like, parse a bunch of texts and be able to pick out, for instance, what would go in an abstract for a manuscript. But the tension is like, well, if AI can just do this for me, how do you get them to learn? And I have no idea what that looks like in English. But I would, yeah. I mean, I think right now that's what a lot of handwringing is over, is that what is the goal? What is the purpose of using AI? And how does that interact with either your professional life or your life as a student?

Bridget: And I would actually take a step beyond that, not just the goal and purpose of using AI. What's the goal and purpose of the learning, right? Like starting with the learning. centering the objectives like you were saying, I need the students to learn these things and the product of which is not the most important, right? And so, anchoring back to the learning outcomes, I think, allows us to properly view artificial intelligence as a tool to get there, right? As opposed to just the product manufacturer, but just a tool to achieve those. What do you think, Julie?

Julie: So, this has really had me coming back to what are the things that we are looking back at the validity of the assessment tools that we use in writing classes. And I think we're already before. AI came onto the scene, I think a lot of educators were already starting to think about this and how it specifically pertains to students that don't necessarily come from this background where they've been educated and how to speak in a very professionally coded way or in an academically coded way in their previous learning before coming to Loyola and that a lot of the ways that we assess English writing inherently privileges those who have been taught to speak in this type of academic verbiage. But does that always show the critical thinking that we want to foster with these assignments? No. I think if you strip it down, and even I think, Michael, some of the examples that you brought up about this slipping into peer review things is that sometimes there's a lot of BS in academic talk in academic writing and that can get passed over simply because it sounds academic but doesn't have a lot of substance to it. So yes, yeah, performative is an excellent word for it. So, what I've been thinking about is how do I assess

then to downplay the need to perform an academic or a professional voice, which I should set aside professional for now, because I think in business writing, that's actually maybe something that they might be called upon to do. But for academic writing, specifically writing that is supposed to be generative, critical, and to innovate, that's where I think it's really important that we're distinguishing between posturing at speaking about things critically and actually saying something of substance. And so, kind of turned away from this game of trying to catch AI and looking for signs of it in the student writing. And instead, looking at how well this piece actually gives critical insight into the topic that the student is writing about. And in my first year of writing class, students are writing about all different topics from scientific topics to more humanities based projects. And so it really runs the gamut. And I have students do a research podcast assignment in which I encourage them to add their own personal flair into this, you know, like tell jokes show your personality here. I had a student who's doing a project on crocodile conservation in Australia, and he is Australian, and he infused this podcast with all of these Australianisms. He really leaned into that identity. It's like, this is so much more engaging to listen to than a very rotempaper on here are the concerns surrounding crocodiles in this environment. And so, I really see ways that when students take up the mantle of adding their own voice into assignments, I think it's actually much better for us as instructors because you get less bored reading all of this stuff or listening to all of it. And we can start to see, OK, here this student really put some heart into this and some thinking into this. And also they're juggling different things like audience and how their words communicate to different in different mediums.So,o like an auditory, I tell them that your transitions are gonna have to be a little bit different than in writing because if the signpost verbally for your audience, how you're going to be structuring your podcast. Somthere's all these opportunities for the type of critical thinking that we want students to get out of writing. And yet, so again, I'm not necessarily looking for students to try to figure out how best to postulate academic writing. But how do you show that you are thinking critically and make it interesting and compelling? So that's been a huge.
thing that I've added explicitly into my assessment is that it's got to be engaging in some way. And that's something that AI, I think, doesn't always know how to read in different situations. And so that's where students can feel confident that they could shine even if they don't have that background in academics.

Bridget: Yeah, and you know, what I feel like you're pointing toward is the ways that we can and maybe now need to invite our students to sort of be more individual, more unique and tapping into sort of their humanity, right? Like what makes them different and special and their perspective on the world and the things that they've experienced and the way that they make

sense of a topic or a book or that that is really sort of shining their humanity in a way that just what are the main themes of Romeo and Juliet? Maybe that's been written already a million times and so that's not quite so. I don't mean to poo poo on Shakespeare here, but you know that in some ways AI is forcing us to okay let's go back to What is it that is different about being a human being, and how can we shine that? And I guess I'm wondering, Michael, what does that look like in the sciences where I'm picturing a student creates or asks a question or kind of comes at something with a critical lens that makes you say, oh man, there you are, or like, wow, that's so cool, that's so interesting. What does that look like in your area?

Michael: Yeah, it is tricky. So, the sciences are... I forget who I was talking to, but somebody... You know, scientists and the humanities, we feel like we're in these different silos. But realistically speaking, the best science is when people are actually deeply creative, right? Like that's... So, pretending that we're all robots and then that's how we're solving all these problems is delusional, right? Like the guy that won the Nobel Prize for polymerase chain reaction was on acid when he came up with it, okay? Like this is not... Wow. That's how this stuff works. That's true.
I'm not recommending that students take acid to get good science experience. But it has happened in the past. The weird part about almost all of this stuff is, Paulina, you asked a question earlier about like, how do you know when you're reading AI writing or what's weird about it, right? And I think a lot of it, as Julie brought up, is it's this homogenized pablum, right, where it's this either hype or it's. It's too perfect, right? It's too like, they didn't repeat this one word, right? And they described it in a very specific way using like a smorgasbord of adjectives and so forth as they're going through. You're like, no human writes like that. That's weird as hell. Like, make mistakes, right? Make mistakes. And even if it's not a mistake, it's not necessarily a mistake when it's just something that is the way that you normally talk.
Right? That you're bringing your humanity to whatever the creative thing is that you're doing. Related to critical thinking, AI sucks at critical thinking. Like, I mean, even though it can do math now and it can do certain types of problem solving, it's still pretty bad at a lot of things. And so critical thinking is important even for programming. Right? Like, I've done these tests before myself. I'm like, I would like you to here is a data set. Here's a here's a big set of files or a giant table with thousands of rows and columns, I would like you to transform the data and then do some statistics on it and then subset it and then make some visualizations. And I just give it that prompt and it's exactly what I would do step by step. And it can't do it. Okay. It returns a bunch of code to me, and it tries, but it can't do it because there's too many little steps in the way. Right. And so usually when people are using it, what you do is you use it as a step-by-step

thing. You're like step number one you know, take the averages of each one of these columns or something like that. And then you double check it and you're like, did you do that right? And then if it did it, do it right. Then you move on to the next, then you move on to the next. And honestly, for a lot of the data analysis stuff, it's not even worth your time to do it. Because in the process of double checking it, you're like, I just did it. Why am I using this? I've been doing this; I can just do it myself. So that's one of the idiosyncrasies that you see there. It's good in bite-sized chunks.

One final piece that I will add in there, there's always workarounds to almost all of this stuff. So, clever, the thing that I worry about is because I teach, I do co-teach across disciplines, so I do have writing assignments in the philosophy side of a course that I co-teach. We have the students generate writing and we're like, hey, that's AI writing. Can you tell? And you're like, I can't really put my finger on it, but it smells like AI writing, right? There's something weird about it. I'm like, cool. So, all you must do is find an essay or two that you've written previously, like you personally wrote it, and then upload it and tell AI to rewrite the prompt using the voice of the person who wrote these other ones. And it'll do it. So, it can clean it up. The takeaway from that is that you can sort of tweak this. And the other piece to bear in mind is for the people who are like super hand-wringy and worried about like, all the students are cheating, but I've caught this many is that you've caught the lazy ones who don't know how any of this works. And that's like the lowest number of students who are using AI in your classroom, because there's going to be some black box number of students who are just using it in a more sophisticated way where it doesn't stick out. And if you appreciate that, then suddenly you're like, well, how do I apply universal design to this? If I know that somewhere between, you know, three and a hundred percent of my students are using AI? Maybe.

Maybe I just need to sort of roll this into my class as like, I know that all of you have access to this. What's a way that I can make sure that I'm structured the course so that you have the ability to continue learning with this other thing that's in the background?

Polina: You know, it's interesting. I'm sitting and I'm thinking that it will be very interesting to listen to this episode in 10 or 20 years in future. And there are many questions that I can ask myself right now. It's just like, I don't know, even 30 years ago, we were laughing on the internet, like we didn't believe that it's going to be future. And now here you go, we're recording from four different places in the United States. Yeah, but anyway, you know,

What is interesting to me is that our conversation today is mostly tailored around the language processing and around the ChatGPT, but there are so many to AI in our real world that we don't even recognize such as for example, natural language processing, right? And handwriting

recognition. So, I'm thinking about our students who are taking notes with them not taking devices now with iPads. And I remember when during online teaching, during the major pandemic, when the shift to handwriting notes on the devices happened, at that time, even the very well-known software such as Notability or I don't know, taking apps, they were basic. And now here you go, you draw a circle, very unperfect circle, and here you go. It's a wonderful, beautiful structure. Or even how we make, how we populate our calendars now with natural language processing. We just say, hey, Siri, hey, I don't know, whoever, make the meeting for tomorrow 8 p.m. I don't know and it's there it's in there it's also artificial intelligence right and I'm thinking about even our job that we're doing as professors as educators so in the recent years we've gotten such an amazing tool such as greatscope.com I don't know if you're

using this but it changed my personal life of teaching 200 students per semester as a breath. So, what it does, it recognizes the patterns of handwriting. And I don't think it's applicable in humanities. In humanities, it was way more complex than in sciences, but we can structure our assignments in such a way that at least a third of the assignment can be graded by artificial intelligence by recognizing the patterns grouping them in the same groups. And then instead of grading 200 assignments one by one, you end up grading just three groups, for example.

Bridget: That's fascinating.

Julie: I would love, honestly, to find AI, a way for AI to offer students more feedback, not necessarily to replace the feedback that they would be getting from professors, but to just offer more opportunities than any one human has the capacity to offer. And I also, I want to go back to something Michael is bringing up that, oh, the students who are good with this technology and arguably know more than their professors, they're already a step beyond that. And the ones that you are catching are the ones that are not good at using this technology. But it also takes a certain level of oversight and critical skill to be able to prompt these technologies to do the thing that you want them to do. So, in some ways, if a student is able to prompt ChatGPT so well as to replicate their voice, they're thinking about the audience and they're thinking about what makes their writing sound like them. They're also probably having to go in and tell ChatGPT, okay, you need to revise this content or they're revising it themselves. So, at that point, I would ask what ChatGPT actually does for them? If it's just helping them construct sentences or organize things. It's like, all right, well, maybe they are doing some of the critical work that we're actually asking them to do. I also, one thing that ChatGPT really doesn't offer for research yet is

it's not good at finding actual research articles. And I don't think it has access to those academic databases. Again, correct me if I'm wrong or if this has changed, but it leaves the free version.

Michael: Yeah, it's got access to like PubMed, and it can access all the open-source journals and the abstracts. But for instance, Paulina, the American Chemical Society keeps like a death grip on all of their publications. So, you would have a real hard time getting AI to interact with the American Chemical Society works.

Bridget: Interesting.

Polina: That's true.

Bridget: Interesting. You know, I wonder, one of the things that we talk about here, too, and actually where the pod, the idea for the podcast came from was our curiosity about the scholarship of teaching and learning and wanting to explore and hear from people about the things that they're doing in the classroom, certainly how they think about it, but then also any scholarship that is coming out of practices and praxis. And I wonder if we shift our sights just a little bit to the experiences you've had thus far, if you are working on or can imagine working on some research projects in this area that would be helpful and instructive to colleagues around the impact, the process that you've been through, how it's been landing with your students. I wonder, do you have any research questions kind of floating around there after the work that you've been doing this year?

Paulina: Or maybe you're already doing some work on the scholarship of teaching and learning.

Michael: So, you're looking for a thesis fodder, right? So, you want to get some grad students? Yeah. I think one of the big questions that I would have would be if you attempted to control for as many things as possible, if you had somebody like Julie or Julie teaching like two sections of the same course, one course where they lean into AI and another course where they don't. Again, you'd have to scale this somehow to make sure you're getting statistical significance, measuring at the end of the day, whether or not the outcomes were different in one class versus the other, right? Like that would be the most straightforward question about how that works in a controlled way. Weirdly enough in the science of teaching and learning, one of the largest factors that's the most difficult to control for is instructor. So in other words, if you've got like, I've

got six instructors, I'm going to split them into three groups over here and three groups over here, and then have this group do one thing and this other group do the other thing, oftentimes you might see a difference or you might not see a difference, but there's already such inter-individual variability across the classes that it's hard to control for. Usually, the way you do that is you just try to scale it as much as possible. So, you're like, we're going to have, we're 20 instructors, and they're going to teach, each teaches three sections a semester.

And then we're going to randomize it next year. So, then they shuffle back and forth. I think that these are all fantastic questions. I think, honestly, for a lot of people, the trick is finding out where that fits in your professional life. There are people in the education department for whom this would make tons of sense. I think the weird part is that academia in the traditional structures of academia in the ivory tower, if you are, for instance, a scientist, who does science, people look at your kind of weird if you're like, I would like to study science education. And they're like, no, no, no, no, no, no, no. That's for people in the education department to take a look at. So, trying to find, again, how does this fit in like the system of like rewards and meritocratic evaluations of people, does this fit? So, I think one of the challenges in this new paradigm where the world is changing so quickly and academia tends to not move quite as quickly, I guess I'll say that in a very tempered way, is we're going to have to do a lot of catch-up, right? I think there's gonna be a big push and the universities and the groups of faculty who are able to adapt rapidly to this new paradigm that we're in are gonna do very well and hopefully they'll be able to crow about it and demonstrate that we're up to speed with everything and the people who don't are gonna be kind of left in the dust. Yeah. Because you're not gonna be prepared for either the students that are coming in and what they know about, and the students themselves are not going to be necessarily as prepared for whatever their next step happens to be.
How about you, Julie? Do you have any thesis?

Julie: As you were saying that how hard it is to control in these situations, I've also been thinking about that myself because I do teach multiple sections of the same class and I find things like the timing of the class during the day, like my 8.30 a.m. class tends to just do worse than my classes that are more like right in the middle of the afternoon. And I'm using the same lesson plans. I'm the same instructor, it's the same syllabus. And the times that are not or students are less likely to come to class at that time or be awake or to get their work done in time are less likely to do well. And, I've found I'm more likely to turn to things like shortcuts and do it poorly enough that I'm catching them easily. So that's something that I've been trying to figure out, like, is there any way to get these 8.30 a.m. classes support or to somehow flatten out the effects of this? And it just, it's hard. Like, students who end up in those classes, they

often, they don't want that time slot for their class. There will be a few students that are like, morning people, go-getters, the majority of them are not.

Polina: You are saying that morning classes are harder for students than later ones?

Julie: Not necessarily the courses, but I feel that students are less likely to be engaged in an early class. And they're also more likely to simply not come to class. If they had something the night before and they don't want to come to class, they're going to skip their 830 class. Not there later.

Polina: That's so interesting because again, from observation in my science chemistry classes, the morning people tend to do better. And that's exactly what is interesting maybe for the future. cross-disciplinary research to look at humanities, English, I don't know, and sciences because I've, I didn't of course conduct any subtle, real subtle research, but this is only personal observation, but it's interesting to look across the disciplines. Yeah, I'd be really interested to know what, what about chemistry?
Or maybe it's you as an instructor who is bringing some wonderful morning energy. I don't know. It could be so many different variables there that are contributing to that. Right.

Michael: I would just say one other confounding variable is the fall to spring transition. Right. Students in the fall.

Polina: Oh, that's another one. Yes. Totally.

Michael: Students in the fall are typically more engaged and typically perform better than students in spring. And the easy, I mean, I'm not, I'm sure somebody's published on this. I'm not familiar with it, but just anecdotally. You see that in the average test scores just across the board, but also our teaching evaluations, right? You can teach the exact same section of a class at the exact same time in fall, and you're teaching evaluations or whatever. And then in the spring, they just drop a little bit. And so, there's this weird cyclical thing, which is always a curiosity of academia when you have a semester system.

Polina: Actually, Michael, that's interesting that you mentioned the teaching evaluations, because I've seen that even teaching the same class, same exact class.

Monday, Wednesday, Friday, and Tuesday, Thursday, we have two grids at Loyola. It brings completely different evaluations.

Michael: Oh, really? Wow. Okay. Anyway, these are all... That's another subtle question.

Bridget It is. And someone should take this up. So, if we're reaching anybody who is interested in this sort of thing, and you know, what I was thinking as you all were talking, I was like, can AI solve this?
Is this a question that could be that artificial intelligence could offer some resolution to? And if the answer is no, though, I am enjoying sort of beholding whatever kind of questions, observations, situations that we find ourselves in that artificial intelligence is not the best tool to use people are or a group is, or a research study is. And so, I wonder, you know, as I am continuing to orient myself in that way, you know, what is it, where does AI belong and where does it not make sense? I think that we are probably all on that journey of trying to figure that out.

Polina: And again, just to maybe wrap up a little bit, I'm with my semi-optimistic view on everything. I hope that it remains our questions, the humanity question, not the AI question.

Bridget: Yeah, absolutely. Yeah, this has been really interesting. And I feel like as often happens with these conversations, we get to the end and feel like, oh, we should do this again, because there are so many things we didn't get to cover. And so, we'll leave the door open, perhaps, to regroup another time.

Polina: And I think Julie wanted to add something.

Julie: I just wanted to add one more thing, is that something that I would be interested in studying in my free time, which I don't have, but is how do we flag what students are most likely to turn to AI rather than their own critical thinking skills? And my hypothesis is that the students that are missing the most class and maybe under, the most duress from other stressors coming into their academic environments are the most likely, at least in my classes I've found, to try to look for a shortcut to getting their work done. So, if a student has missed a lot of classes, if they haven't been turning in assignments and all of a sudden, they want to produce a portfolio of all their missing work at the end of the semester. I almost invariably have found in the past few semesters that that work will be AI written. And so, it's just like, I'm starting to identify these

students that I feel like are at risk for this. And now they have a low hanging fruit that they could use to help shortcut these things that are maybe snowballing in their life. And I just wonder if there's an opportunity here to recognize that these students are struggling and to intervene in a way that's going to be more helpful to them than simply allowing them to turn in late work. I just I don't think allowing that is necessarily to the instructor or the students benefit because it amplifies opportunities for really egregious cheating that's also very recognizable. So yeah, that's kind of my hypothesis is that the students that are most, having most difficulty navigating other aspects of getting through academic life are going to be the most likely to turn to this as a tool to try to shortcut.

Michael: Yeah, I think that sounds really cool. The second part of that. Yeah, knowing what we do. No, I was just going to say, that sounds like a fantastic, I mean, and also a pretty straightforward study to put together, right? Which is just like anonymous surveys of students and then collect a bunch of, try not to keep the survey super long, but talk about what are the factors that you might hypothesize contribute to AI use, and then ask them if they have used AI to submit assignments so that you can pinpoint these seem to be the key predictors of whether or not they're going to use it in a pathological way. And then the follow-up would be, OK, now that we recognize that, what interventions can you come up with in a classroom setting to try to mitigate that, to try to either help the students out or structure the course in a way that they're less likely to do those things?

Polina: Yeah, absolutely. It brings me back to the conversation about integrity and how during online teaching, we were all concerned about students using certain resources that were banned during their in-person teaching. And the best advice that we could come up is just to design the class in such a way that we know that the resources are available and maybe AI is another tool that we just need to adapt and adapt in adapt. Right. So, right. Yeah, absolutely.

Bridget: And especially in the landscape of higher education that we find ourselves in. And the I was just writing about, you know, COVID and the racial unrest and climate disasters and mental health crisis among young people, it's just a lot. It's a lot that people are carrying. And to your point, Julie, to recognize that in some cases, utilizing AI for academic dishonesty is a symptom of these greater things that are going on. And what would it be like if we all turned our attention to how can AI be beneficial?

We know that these things are happening. We know that people are carrying a lot. And how might it be a tool in that way to, yes, of course, encourage learning, but then also make some other things easier? So maybe that's where we'll pick up the next time. I will invite your back. We can see where that takes us. Or we'll ask ChatGPT to tell us what it thinks. Right. So. Thanks so much for your time and your insights and sharing your examples from your own teaching. We are really grateful to have learned from you over the last hour or so and grateful for the work that you're doing with your students. Thank you. This was wonderful. Thank you, Michael.

Wow, what an interesting conversation. Stick around for a few more minutes while we reflect on the episode.

Reflecting on the episode

Bridget: So that was a good one.

Polina: Yeah, that was pretty unusual, right? So, we've got some tools, some insight. And I think it also sends us to lots of thinking about the ethical part of it, just in general.

Bridget: Yeah, absolutely. And I think that it sorts of echoes some of the things we've been learning from our other guests about the purpose of education, you know, what is it all about? And then how can artificial intelligence help move us along in that direction that hopefully as people get more and more comfortable with it, it doesn't have to be a brick wall that people must contend with. It just becomes part of part of the tool set to help students learn in different ways. But that was great. I feel like I have so much more to learn.

Polina: Yeah, that's true. And its interesting how different perspectives are, how different and similar our perspectives from the humanities and hard sciences. And I think we were fortunate to have both sides. Yeah, absolutely. Yeah, absolutely.

Bridget: And some good SOTL questions. Many. I was thinking, oh, people who are going to be our listeners, right? Who is going to be listening to our podcast, maybe. I, as a listener, would start taking notes. Yes.

Bridget: There are so many interesting things. Hopefully, maybe we can figure out some way people can contact us to say, oh, I have an idea for a SOTL project and who wants to partner up

on that. That could be cool. And it's already easy to contact us, right? We are at Loyola University of Chicago, Dr. Bridget Colacchio and Paulina Pine. Wonderful. Yay.

I can't wait to talk to our next people. Join us again in the future if you're still listening. And enjoy your day.