**Teaching and Learning in the Age of Generative AI with**

 **Derek Bruff, PhD. Episode 182**

00:00:00 **Derek**

I allowed my students to use WolframAlpha on their exam, which meant that they could just input the matrix and then they could have the tool do the computational step. And it meant that that question was no longer 25 minutes, it was more like five to seven minutes.

00:00:13 **Derek**

But the students still had to do what I thought were the hard parts and the important parts. And so, because of the tool, I could actually shift my learning objectives. We're not going to worry quite so much about this computational step. We're going to focus more on the conceptual piece. And so, I could retool my learning objectives because this technology came out.

00:00:36 **Christina**

Hi, I'm Christina Barsi.

00:00:37 **Sun**

And I'm Sun Ezzell. And you're listening to the Magic Mountie Podcast.

00:00:41 **Christina**

Our mission is to find ways to keep your ear to the ground, so to speak, by bringing to you the activities and events you may not have time to attend, the resources on campus you might want to know more about, the interesting things your colleagues are creating and the many ways we can continue to better help and guide our students.

00:00:58 **Sun**

We bring to you the voices of Mt. SAC from the classroom to completion.

00:01:02 **Speaker 1**

And I know I'm going to achieve my goals and I know people here are going to help me to do it.

00:01:06 **Speaker 2**

She's a sociology major and she's transferring to Cal Poly Pomona. Psychology major, English major.

00:01:13 **Sun**

From transforming part-time into full-time.

00:01:15 **Speaker 1**

I really liked the time that we spent with Julie about how to write a CV and a cover letter.

00:01:23 **Christina**

Or just finding time to soak in the campus.

00:01:25 **Speaker 1**

Think of the natural environment around us as a library.

00:01:28 **Christina**

We want to keep you informed and connected to all things Mt. SAC, but most importantly, we want to keep you connected with each other. I'm Christina Barsi, Mt. SAC alumni and producer of this podcast.

00:01:39 **Sun**

And I'm Sun Ezzell, learning assistance faculty and professional learning academy coordinator.

00:01:44 **Christina**

And this is the Magic Mountie Podcast.

00:01:52 **Voiceover**

If you missed Fall Flex Day 2023 or just want a recap of the amazing presentation on AI from Dr. Derek Bruff, then this is your chance to re-listen and learn ways in which to leverage AI in the classroom along with some tools beyond ChatGPT, as well as the barriers they might pose. Enjoy.

00:02:18 **Moderator**

So, good morning again and welcome to Fall Flex Day. Thank you for joining us as we welcome the 2023/24 academic year.

00:02:25 **Moderator**

For our theme this year we chose celebrating Mt. SAC. We are excited to welcome many new faces to learn more about our campus by numbers, about how we can amplify our identity as a Hispanic serving institution, how we can embrace new technology and other techniques to enhance our teaching, how to take care of ourselves and so much more.

00:02:48 **Moderator**

The Flex State Planning Committee is excited to welcome with us today Dr . Derek Bruff who will be speaking to us about artificial intelligence in higher education.

00:02:57 **Moderator**

So, Derek Bruff is an educator, author, and higher ed consultant. He directed the Vanderbilt University Center for teaching for more than a decade where he helped faculty and other instructors develop foundational teaching skills and explore new ideas in teaching.

00:03:14 **Moderator**

Derek consults regularly with faculty and administrators across higher education on issues of teaching, learning and faculty development. He has written two books, Intentional Tech: Principles to Guide the Use of Educational Technology in College Teaching and Teaching with Classroom Response Systems: Creating Active Learning Environments.

00:03:36 **Moderator**

Derek writes a weekly newsletter called Intentional Teaching and produces the Intentional Teaching Podcast. Derek has a PhD in mathematics and has taught math courses at Vanderbilt and Harvard University.

00:03:50 **Moderator**

Welcome Derek . Thank you for sharing your day with us.

00:03:54 **Derek**

Thank you for that kind introduction. I'm very excited to be with you all today. I'm happy to be here with you all and to talk about AI and teaching and learning the good, the bad, and the ugly. It's been a busy year for this set of technologies and its impact on teaching and learning and I think this fall we're going to learn a lot more about how they work.

00:04:13 **Derek**

I will say that folks are coming to this topic, both the larger topic of generative AI, but also the more particular topic of AI in teaching and learning. I know you guys are coming at this with a lot of different prior knowledge and experience, so I'm going to start fairly high level , then we're going to kind of drill down into some teaching and learning applications.

00:04:31 **Derek**

So, ChatGPT is a tool that probably comes to mind first when it comes to generative AI. This tool was launched last November and it is a chat bot with a large language model running underneath it. And so, it is very good with words. You can ask it questions or ask it to write things and it will generally respond with human sounding prose .

00:04:52 **Derek**

So, I asked it what does the phrase, the good, the bad, and the ugly refer to? And it told me about the 1966 Italian Spaghetti Western film with Clint Eastwood, but then also gave me a more general definition of the term.

00:05:04 **Derek**

And I think ChatGPT has got a lot of attention, particularly last academic year, December or January, because two main things, one is that this type of question and response is a very common type of assessment in higher education where we ask students an open-ended question and we want them to respond with a few sentences or a few paragraphs or write an essay. And ChatGPT looks like it does that really well. It doesn't always do that really well, but it certainly looks like it does it really well.

00:05:33 **Derek**

So, it aligns with a very common form of assessment, which naturally got faculty and other instructors thinking about how students might be using this in ways that would shortcut the learning process. It also came out in November, which is a terrible time during the academic year to make sense of a new transformative technology.

00:05:52 **Derek**

So, lots of conversations, it has a certain kind of voice, this tool does, a kind of authority that it projects even when it may not know what it's actually talking about. I liken it to the character of Cliff Clavin from the TV show, Cheers, who was a postal carrier who sat at the end of the bar and often talked to great length about topics that he didn't actually know much about. And ChatGPT sometimes sounds like that.

00:06:16 **Derek**

I like to say that this is a tool that speaks but does not think, doesn't actually know things, but it can put words together pretty well. And just to give you a little sense of how it does this, I won't go into many details here, but to simplify greatly these models, they take a random walk through natural languages. These are the languages that we humans speak and write in.

00:06:38 **Derek**

The tools use a large collection of texts to deduce which words are likely to follow other words. And so, the large language models have looked at a lot of text and deduced those types of sequential connections. And then they're essentially taking a random walk and generating words in this similar fashion.

00:06:57 **Derek**

And when I say it's a lot of text, it's really a lot of text, billions of words that are in these models and that's why they're so good at producing texts that sounds like humans have written it. But again, they don't know anything. They just know which words are likely to follow other words.

00:07:15 **Derek**

So, I have found that there are two very common reactions to these generative AI technologies, one of which is that everything is awesome. I found this tweet earlier in the year by Marc Andreessen, the co-founder of Netscape, you may remember from the early days of the internet, he is now a venture capitalist and he said, we are just entering an AI powered golden age of writing, art, music, software and science. It's going to be glorious world historical. So, clearly someone excited about this setting the bar very low at the outset.

00:07:52 **Derek**

But these tools can do some pretty interesting things. So, for instance, another type of generative AI, an image generator was used to create the images from a comic book. The artist wrote the comic book and plotted it and scripted it, but then worked with an image generator, one called Midjourney to create these images so the artist could ask the tool, imagine this picture and give some details. And then the tool would generate these images.

00:08:17 **Derek**

And so, this art was created with the use of AI technologies by this artist. AI can also help you write, this is a host by Ethan Mollick, who is a business professor at UPenn , I believe. He went to a different tool Bing Chat , which also is powered by a large language model.

00:08:38 **Derek**

And he asked the tool to go read his blog. And I should say, if you're following AI this year, you've probably seen some of Ethan Mollick's work. He's doing a lot of exploration and writing in this area. Ethan asked the chat tool to go read his blog, deduce his writing style , and then write a concluding paragraph for his new newsletter that made certain points and adopted his writing style.

00:09:05 **Derek**

And so, Bing Chat did that and Ethan was able to give him some feedback that is pretty good, but can you expand it? And in with more advice and Bing came back with a second version and Ethan gave it more feedback and Bing came back with the third version and that was the paragraph that Ethan used in his newsletter.

00:09:21 **Derek**

And so, there's lots going on here. Again, these tools, the large language models are very good with words, putting words together, in sensible ways. You can also refine your prompts with them. And so, often, even if it doesn't give you a useful response the first try, you can give it some feedback and it has a kind of memory where it can revise and resubmit.

00:09:40 **Derek**

So, in the academic areas there's a tool called Elicit that can find research papers for you. So, instead of going to Google Scholar or your local library database, you can go to elicit.org and you can type in a research question and it will attempt to find scholarly sources for you that might answer that research question.

00:09:59 **Derek**

I had asked it how should I form student groups when I'm using group work in the college classroom? Kind of an educational research question. And it went out and it searches a database called the Semantic Scholar, I believe is the name of it.

00:10:13 **Derek**

And so, it's kind of a vetted database of scholarly articles. Again, it's good with words, it was trying to deduce from the information it had about these scholarly articles, which of those articles might answer my research question. And so it gives me a table of results with the citation information, the paper title, the author, the journal.

00:10:30 **Derek**

One of my favorite features is that it will summarize the abstracts for you. So, if you find abstracts too long and boring to read, it will give you an even shorter version of the abstract as well as trying to deduce interventions and outcomes that are measured, sample sizes that kind of thing.

00:10:45 **Derek**

And so, I use this now regularly when I'm looking for journal articles as a way to find articles that may be helpful to me. And if you can't understand one of those articles, you can give it to another tool called Explainpaper, which allows you to upload a PDF and highlight a sentence or two and it will then attempt to explain that sentence to you to summarize or paraphrase it, which I think is kind of interesting. Again, these tools are good with words and rephrasing things.

00:11:09 **Derek**

And then fairly recently ChatGPT rolled out a new tool called Code Interpreter, which can among other things visualize data for you. It can actually generate computer code and run that code for you and then give you the results. So, ChatGPT for a while now has been good at writing computer code on command, but now it has an executable environment where it can run that as well.

00:11:32 **Derek**

And so, one of the things you can do is you can give it a data set . I gave it an Excel file with some information on some movies that came out in the year 2013. It had the Rotten Tomatoes ratings for these movies, both the audience ratings and the critics ratings.

00:11:47 **Derek**

And I said, just please describe this dataset. And so, that's all the information I gave it. It deduced everything else from the Excel file itself. Made some sensible inferences. I asked it to visualize these data. Of course with this kind of data I want to compare the scores to each other. So, I asked it for a scatterplot and it did that.

00:12:06 **Derek**

And not that these are exceedingly hard tasks to do. Many of us could use a variety of software tools to do this type of data visualization. But the fact that I didn't have to remember what buttons to push or what commands to use in my software, I can just ask in natural language and it will generate these data visualizations, I think is kind of powerful.

00:12:25 **Derek**

So, there's a lot that these technologies can do for us. Of course, some people have had different reactions to their advent. These technologies have their problems and their issues. These large language models will quite famously hallucinate facts.

00:12:41 **Derek**

So, this was a post by Ted Underwood who asked Bing Chat to tell him about himself. So, it used to be you might google yourself for fun, now you can ask a chat bot to tell you something about yourself.

00:12:53 **Derek**

And it replied, it said "Hello, this is Bing. You are interested in Ted Underwood. He is a professor of information sciences and English at the University of Illinois Urbana-Champaign. He is also a blogger and Twitter user who studies literary imagination and machine learning. Unfortunately, he passed away on August 28th at his home. He was greatly loved by family and friends and served his country with honor."

00:13:14 **Derek**

And Ted posts, "Terribly sad. I have to say. I'm angry that I wasn't informed. I'm always the last to know." So, these tools put words together in sensible ways. They don't actually know things . And so, when it went searching for Ted Underwood, it found some information that was accurate and summarized that well. But it also added some words that were not true about Ted Underwood.

00:13:35 **Derek**

And so, they're not making up things, there's no intentionality behind it, but they will state things that are factually untrue.

00:13:42 **Derek**

There's also the garbage in garbage out problem. And so, this is a phrase from computer science that says that if you give something bad data, it's going to produce bad data. And that's a problem with these because as I said, they were trained on large sections of the internet, which is full of problematic texts of various kinds.

00:14:01 **Derek**

So, for instance, some journalists a few months ago asked ChatGPT to write some performance reviews for hypothetical employees. What kind of feedback would you give a kindergarten teacher, a receptionist, a doctor, a lawyer, a construction worker? And in the prompts there was no gender specified for these employees. But in the responses that ChatGPT generated, it made a lot of assumptions about the gender of these employees.

00:14:27 **Derek**

It assumed that the kindergarten teacher was always female. It assumed that the mechanic was almost always male. And so, the gender biases that it produces are based on the gender biases that it has in its training data. So, garbage in, garbage out. And there are worse examples, but this is one that gives you a sense of it.

00:14:47 **Derek**

There are also potential copyright issues. So the fact that these tools were trained on on large portions of the internet, there are authors who are upset about this, there are artists who are upset about this. And so, the copyright status of all of this will be settled in the courts one way or another. We don't quite know how that will shake out.

00:15:03 **Derek**

There's also kind of copyright issues on the output too. So, that comic book that I mentioned, the artist applied to the U. S. Copyright Office to try to get a copyright on the comic book. The copyright office said, no, it is un-copyrightable. You cannot copyright this, that the art that was generated was not generated by a human. And so, it's not eligible for copyright.

00:15:21 **Derek**

And so, the intellectual property that's generated using these tools may be uncertain status until we see some more court cases that figure this out.

00:15:30 **Derek**

There's also inequities. So, ChatGPT is free to use but only the base version is free. If you want the ChatGPT plus which offers more access, more features, it's going to be $20 a month. And so, not every student is going to be able to afford $20 a month to get ChatGPT plus access.

00:15:47 **Derek**

And so, we're going to see inequities. Students who don't have access to tools or students who don't know about certain tools that may be useful in their professions or disciplines.

00:15:55 **Derek**

AI will also get better. So, back in the spring, I was telling faculty, you know, one way you can get around AI assistance for assignments is to ask students about current events because the training data for ChatGPT cut off in 2021. And that is true for the free version of ChatGPT. I asked it about a May, 2023 Supreme Court decision and it told me it had no idea anything about that.

00:16:21 **Derek**

But when I went to the paid version of ChatGPT, which has a more advanced language model underneath it, it actually went out and searched the internet, found some information about this recent Supreme Court decision and gave me a useful and accurate summary of it.

00:16:34 **Derek**

And so, the advice I was giving about these tools, even back in March and April in some cases is no longer valid. And so, I expect the tools will continue to change. And so, some of what I tell you today is probably not going to be true six months from now, which I think makes for a challenging teaching environment.

00:16:49 **Derek**

And lastly, these tools will be unavoidable. So, we often use ChatGPT as kind of a shorthand here, but it's actually one of many, many tools. Google Docs, some people already have access to an AI writing assistant there. It's going to be in Microsoft Word.

00:17:03 **Derek**

Just this week I opened up LinkedIn to write a post and it asked me if I wanted an AI draft of my post. So, these are going to be everywhere. I think my favorite example of this is Wendy's, the fast food restaurant is testing out chatbot that will take drive-through orders.

00:17:19 **Derek**

And I learned reading this article that apparently the industry standard error rate for fast food orders is already 15%. So, it just has to do at least that good in order to be useful here.

00:17:29 **Derek**

And it kind of makes sense in some sense. Because in the drive-through you want to use natural language to describe what you want to eat, but that natural language needs to get put into a computer system so all the cooks will know what to prepare. And so, using a chat bot as that interface makes some sense and it may actually be pretty decent at it. We'll see.

00:17:49 **Derek**

So, a few things to think about as we move into the teaching and learning space. We might need to change our learning objectives because of generative AI. And I'll share a brief story from about a decade ago when a tool called WolframAlpha came out.

00:18:03 **Derek**

I'm a mathematician by training and I teach regularly some math courses. I was teaching a linear algebra course about 10 years ago when WolframAlpha emerged. This is a tool that's based on Mathematica, which you may be familiar with. It is a website that has a little box that you can ask a math question. And unlike ChatGPT, this tool actually knows stuff. It is a computation engine underneath.

00:18:27 **Derek**

And so, it will attempt to interpret your math question and then answer that math question correctly. And so, this was a pretty powerful tool and and really easy to use because of its simple interface. Again, you don't have to know where all the buttons are to do the math, you can just kind of ask your math question.

00:18:43 **Derek**

And so, what this meant for my linear algebra class was there was a certain type of question that I would often ask my students, a word problem where I would ask students to model a given situation using what's called a matrix, just rows and columns of numbers, basically, a set of linear equations.

00:19:00 **Derek**

So, they would have to model a situation with this mathematical tool and then they would have to do something called row reduction on that matrix. And that was a kind of time consuming error prone computation process that they would have to do on that matrix. And when they were finished with that, they would get some numbers and then they would have to interpret those numbers in light of the original question.

00:19:20 **Derek**

So, there was kind of three phases. Model the situation, do the computation, and then interpret the numbers in light of the original question. And that was about a 25 minute test question for me because it would take them that long to do one of these questions. Mostly because of that computational step in the middle where they're doing so much arithmetic.

00:19:40 **Derek**

I allowed my students to use WolframAlpha on their exam, which meant that they could just input the matrix that they came up with into the tool and then they could have the tool do the computational step, the row reduction, and it would do it quickly and it would do it correctly. And it meant that that question was no longer 25 minutes, it was more like five to seven minutes.

00:19:59 **Derek**

But the students still had to do what I thought were the hard parts and the important parts, modeling the situation correctly and interpreting those results. And so, because of the tool, I could actually shift my learning objectives. We're not going to worry quite so much about this, frankly quite boring computational step. We're going to focus more on the conceptual piece and there'll be many more opportunities for students to practice that conceptual piece and for me to assess them on it.

00:20:25 **Derek**

And so, I could retool my learning objectives because this technology came out. And so, we're seeing some calls for that in lots of areas now, thanks to ChatGPT. Writing for instance , I've got a quote here from John Warner who's the author of Why They Can't Write: Killing the Five-Paragraph Essay and Other Necessities.

00:20:43 **Derek**

And he says , "Part of the problem is that we have been conditioned to reward surface level competence like fluent pros with a grade like a C plus, a B minus , or B grade, when it's just surface level competence. We may have to get used to not rewarding pro forma work that goes through the motions with passing grades or it may mean finding other elements of the experience to focus on in terms of grading."

00:21:08 **Derek**

So, maybe we grade less on grammar and syntax because we know the AI technologies can handle that for our students. And we focus more time and effort on making arguments, connecting with audience.

00:21:20 **Derek**

In computer science, they're actually ahead of the rest of us because they had code generation tools that came out before ChatGPT. They've had about another year or so to get used to these tools. And my understanding is pretty much any computer programming assignment you would give students in a first or second semester computer science course can be accurately done quite easily by ChatGPT and some of these other tools.

00:21:45 **Derek**

And so, they've had to think about what does this mean for what we teach, particularly our introductory students. And I found this great white paper by Becker and colleagues and they argued that this minimally suggests a shift in emphasis towards code reading and evaluating rather than code generation.

00:22:02 **Derek**

So, you might look at a first semester computer science course this year or in a couple of years and students might be writing a lot less code but reading more code and evaluating more code, which is a useful skill for computer software engineers. They're always reading other people's codes anyway. But these tools may shift the curriculum in this kind of way.

00:22:22 **Derek**

On the other hand, we might keep some learning objectives even though AI can shortcut the work. So, I'm a bird watcher. This was a hobby I picked up in 2020 when I was home all the time and looking at the birds in my yard.

00:22:34 **Derek**

There's an app that I use all the time called Merlin. It's from Cornell University and it uses AI to listen for the sounds of birds in the area and try to identify those birds. So, I can walk in my front yard and open up the app and it will listen to the bird song and it will do some pattern matching to try to say, "Oh, that's a Yellow-throated warbler," or what have you .

00:22:55 **Derek**

And I use this all the time because I'll know, oh, there's a Yellow-throated warbler in the area. Let me see if I can go find it? Or maybe take a picture of it.

00:23:02 **Derek**

This is not generative AI, but it is a form of AI. And so I reached out to a colleague I know at University of Connecticut, Margaret Rubega, and she is a biologist and an ornithologist. She teaches classes on birds. And I asked her, because I knew she had her students learn to identify birds as part of their coursework. And I asked her, "Do you allow them to use tools like Merlin to help with that?"

00:23:26 **Derek**

And she said, "Absolutely not." She said, "The goal is for students to gain skills to advance their careers as professional field biologists . When the bird identification you are doing is data, it is important for you to be able to reach an identification for yourself and to have a sense of how certain that is to say uncertain you are about the identification."

00:23:48 **Derek**

In her case, having students use an AI tool like Merlin does not help them build the skills they need as field biologists. And so, she bans it.

00:23:58 **Derek**

Now she has a couple of things working for her. One, she doesn't have to ban Google Docs and Microsoft Word. She's prohibiting a certain class of AI technology used for bird identification. It's a little easier ban to enforce.

00:24:11 **Derek**

Also, she teaches upper level students who know their career path. They know why they're taking the course and what they might get out of it that will help their career. And so, it's easier to make that case to students that in fact they need to learn these skills without the AI. And so, I think the student population question is a big factor here.

00:24:29 **Derek**

So, one metaphor I've heard for AI is AI as training wheels. So, what role might it play in our courses? Could it work like training wheels? So, when a young child is trying to learn to ride a bicycle, they have three main skills to learn. They have to pedal, they have to steer, and they have to balance. Those are the big three.

00:24:48 **Derek**

Training wheels, it does the balancing for the kid. So, now they can focus on learning the other two, the pedaling and the steering. And a lot of us probably learned how to ride with training wheels. And eventually you take the training wheels off and the the kid has to learn how to balance as well.

00:25:02 **Derek**

And so, it may be that we can use AI as a form of training wheels to take on some of the work for students in the short run while they develop other skills and maybe eventually come back to those first skills, the training wheel skills and and teach them those at a later date.

00:25:17 **Derek**

But I've also talked to a lot of parents who swear by a different way to teach bike riding and that's the balance bike. But what it means is that when you're learning to ride on a balance bike, you have to learn to balance and steer, but you don't have to learn to pedal yet. That will come later.

00:25:33 **Derek**

It's a different sequence of skill development here. And I've talked to a lot of parents who say this is way easier. Essentially the balance is so critical. We need to teach that first. Learning to pedal is a lot easier later. And so, as you think about what you're teaching your students, think about the sequencing and there may be an unexpected role for AI in that.

00:25:53 **Derek**

I'll also put out a third metaphor, and that's AI as electric bike. In my town we have these that you can rent that have a little electric motor and give you a boost, especially when you're going uphill. And in that case, you still have to balance, you still have to pedal, you still have to steer, but you're getting some assist from the technology.

00:26:12 **Derek**

And I'm anticipating that there will be a lot of professions now and in the future where AI will play an important role as an assistive technology that is, it won't do all the work for us, but will help us do parts of our work more efficiently or more accurately.

00:26:27 **Derek**

And so, you may be in professions where they're figuring this out right now, what are the appropriate uses of AI? And so, we may need to teach our students how to use AI well because it will be an ongoing part of their bike riding experience.

00:26:40 **Derek**

Now speaking of AI and using it well, I have another metaphor that I like. Again, I'm a bird watcher and a photographer and I think about how I learned photography years ago. I actually went to a digital photography class, that's what it was called at the time. And there's a lot of conceptual learning that happens in photography. You have to know about light and composition and depth of field.

00:27:04 **Derek**

But then there's also a lot of technical learning because you can't take a photo without a camera. And so, I have to learn how my camera works, what do the buttons and the knobs and the settings do on my camera? And I would argue that when I was learning photography, as I continue to learn photography, the conceptual piece certainly helps me understand what those buttons and knobs do.

00:27:25 **Derek**

But there's also value that goes the other way. As I'm experimenting with my camera and taking different pictures using different settings, I'm getting a better sense of the conceptual part of learning photography as well. That there's a useful reciprocal relationship here between the conceptual learning and the technical learning.

00:27:41 **Derek**

And I would say that there may be some opportunities to use generative AI in that way to help support some of our traditional learning holes as students have tools they can play with to learn those things.

00:27:51 **Derek**

So, AI may help students face the blank page. A lot of our students struggle to get started with an assignment, especially a writing assignment. I found this post on Reddit from a student with ADHD who really, and I've heard from many folks with ADHD, the getting started phase is really hard to do. And so, maybe have the AI draft something or outline something and once there's something on the page, now they can take it and run with. That could be super helpful for some students.

00:28:15 **Derek**

Less helpful for other students. And that's the balance bike metaphor. Some students would benefit from a little AI help later in the process. They need to do the brainstorming themselves, but they might need a little help polishing their grammar or their phrasing later in the process.

00:28:31 **Derek**

AI can also help students explore a topic. I teach a cryptography course, a course in codes and ciphers sometimes. And so I asked Bing Chat to tell me about a particular cipher machine from World War II, the Japanese Purple cipher.

00:28:45 **Derek**

And not only did it search the web and find some information and summarize that well for me, it gave me links to it sources. And more importantly, it gave me, if you see at the bottom there, other questions I might ask about this topic, which I think is really, really interesting. And that type of question generation might be helpful for some students as they're trying to explore and learn a topic.

00:29:07 **Derek**

AI can also provide examples to critique. And this is one of my favorite examples so far of using AI. I actually had a chance to present at Yale University of all places earlier this year. And I talked to a couple of faculty there at their divinity school. They were teaching a master's level course on the history of Christianity in the Americas.

00:29:27 **Derek**

And they landed on a ChatGPT assignment that I thought was very clever because it uses what ChatGPT is good at and what it is bad at in the service of student learning. So, they gave their students a set of prompts that the students could pick from, and all the prompts basically asked for a sermon or a speech or a piece of writing that either made a certain argument or was written from the perspective of a certain person.

00:29:52 **Derek**

So, for instance, the first one here in the slide says, "Write a sermon from the perspective of a revolutionary Catholic priest arguing that God supports Mexican independence from Spain." So, that's a particular point of view, a particular kind of argument, particular time and place.

00:30:08 **Derek**

Or the second one there, "Write a sermon by Jarena Lee explaining why she is a woman would be permitted to preach." And I believe Jarena Lee is the first African American woman who has ordained African as a preacher in the United States.

00:30:21 **Derek**

So again, a particular point of view, particular voice. The students picked the prompt they wanted to, they gave it to ChatGPT and they had ChatGPT write that sermon or that speech. And the assignment was then to evaluate and critique the thing that ChatGPT generated here.

00:30:38 **Derek**

And so, the faculty said the students really did well in this because ChatGPT is pretty good at genre. So, when I ask it for a sermon, it's going to write something that sounds like a sermon. It's not bad at arguments. So, it's making the kinds of arguments that someone in that position might make. It is bad with specifics and with kind of the particular ways that particular people speak.

00:31:03 **Derek**

And so, for instance, the speech from a Catholic priest that ChatGPT generated makes a lot of calls to Jesus as an authority figure. But I have learned now that the Catholic priest of that time and place would've actually made more appeals to the Virgin Mary than to Jesus.

00:31:22 **Derek**

And so, that's a bit of culture that ChatGPT doesn't know anything about, but it was a great thing for students, connection for them to make between their readings and the output of ChatGPT.

00:31:30 **Derek**

Or like the sermon by Jarena Lee made some reasonable arguments for why women might be allowed to preach in that setting. But it didn't sound like Jarena Lee, it didn't use her ways of speaking. One student wrote it sounded like it could have been written by a Southern Baptist pastor in the year 2023.

00:31:45 **Derek**

And so, again, ChatGPT is good at genre but bad at particulars. And so, this was a really rich assignment for students because it generated something appropriate, but still had a lot of room for students to critique and make arguments about it. And each student could get their own sermon to criticize because ChatGPT can just make these all day long.

00:32:05 **Derek**

And so, I think this is a really useful strategy. It also has the added benefit of teaching students about the tools and what they're good at and what they're not good at. And you can do this in a lot of disciplines.

00:32:16 **Derek**

So, my friend and colleague Robert Talbert is a mathematician. And he posted on Twitter a few weeks ago, instead of always giving his students a homework question that these tools might or might not be able to solve, he's going to ask students to critique the output of these tools.

00:32:31 **Derek**

So, he has this question about choosing donuts, a kind of probability or a common ... question, accounting question. And he gave it to Google Bard, which is another one of these tools. And Google Bard is a strange tool because it knows it is making stuff up. And so, it will give you multiple drafts of its responses, which is interesting for math question because in theory, there's just one right answer here.

00:32:54 **Derek**

So, Robert's assignment for students is going to be evaluate these three different possible answers and let me know which one is the best answer and why. Really great use of these tools. And also again, teaching the limitations of the tools.

00:33:10 **Christina**

Thank you for listening to the Magic Mountie Podcast. And don't forget to share your favorite episodes.