***TRxending* Episode 1: Generative AI in Pharmacy Education**

Justin - Host (00:00):

From the Faculty of Pharmaceutical Sciences at UBC, welcome to Trending, A podcast dedicated to exploring trending topics across all areas of pharmaceutical sciences, including research, practice, education, and community. Our episodes are recorded on the traditional, ancestral and unceded territory of the Musqueam people. We encourage you wherever you're listening to also take a moment to consider the land you are on, the history, the original caretakers and your relationship to it. Pharmacy education is on the cusp of a generative AI revolution where innovative technology promises to transform the way students learn from personalized content delivery to groundbreaking assessment methods. AI is poised to elevate the entire educational experience. However, implementing AI and education comes with its own set of challenges. It's not just about adopting the latest AI tools. There's a critical need to address issues such as protecting student privacy, ensuring accuracy in AI generated content, and maintaining the delicate balance between enhancing teaching and preserving the human element in education. Today I'm joined by JP and Brie, two leaders in educational technology who are helping the faculty navigate the exciting, yet challenging landscape of generative ai. Today's discussion delves into the current state of generative AI in pharmacy education, explores innovative projects reshaping the field, and offers a vision for the future where AI serves as a transformative force in learning.

JP (01:25):

I am JP Marchand. I am the director of Educational Technology and Learning Designs here at the Faculty of Pharmaceutical Sciences. I've been here for about 15 years, and I've been growing the office of the O-E-T-L-D at Tech and Learning Designs, and yeah, that's about it.

Brie (01:47):

And I'm Brie. I'm the manager of educational technology in the O-E-T-L-D, so I work closely with JP helping to match technologies with educators when they're wanting to use technology in their teaching and learning.

Justin - Host (02:00):

Perfect. Thank you guys for joining today. I guess we'll jump right in with kind of the first part of it. In general, what is generative ai?

JP (02:10):

Yeah. Well, the answer is ever evolving, but essentially it's an algorithm that is capable of creating unique content based off of the information that it has learned from, and it requires a prompt from a user to ask a question or a statement, and most generative ais at this point are capable of creating multimedia, so music, songs, images, movies, or just text based off of that prompt. So that's I think in a nutshell what generative AI is at this moment in time. I don't know if Brie has anything to add to that.

Brie (02:53):

Yeah, I would say I think they're based off of slightly different technologies depending on what you're looking at. So if you're looking at image or movie or film generation, that is a different technology than

our text generation, like large language models that maybe we're used to using through something like chat GPT.

Justin - Host (03:10):

Yeah, it's a whole new interesting world, I guess.

Brie (03:13):

Is. It is. It's very interesting.

Justin - Host (03:15):

How would you say this applies to pharmacy education and teaching?

JP (03:21):

So again, that's evolving. I think we are getting past the fears of AI when it first came out. It's going to take over, it's going to replace jobs, it's going to ruin industries and stuff. And I think what we're seeing now is, okay, how can we use this technology to enhance what we're doing in the teaching and learning space, not just in Pharm Sci, but kind of more in general in higher education.

(03:53):

I think after we kind of got past that initial, what is this? What is it going to do to our industry, to our area of focus, it's now we're asking the question of, okay, what can it do for us and how can we use it to improve what we're doing? And so taking that mindset, I think one of the biggest things that we're seeing right now is just the evolution of assessments and taking the technology and trying to figure out getting away from the standardized multiple choice tests to look at how can we use this technology to improve how we're assessing students and to improve how we are interacting with them, engaging with them on a daily basis. I think that's kind of an exciting thing for me to look at of how we can use it so that students are getting a better learning experience. Teachers can perhaps remove some of the logistical hurdles or questions about how can I do this in a fast way, in an easy way? And I think using AI in that manner, that's kind of what gets me excited about it.

Brie (05:08):

Yeah, I mean, I think for me, what's exciting is the enhanced ability we're going to have to individualize learning for a lot of students. I still get nervous about direct student interaction with a lot of these platforms at this time. We're still pretty early on, and I don't think a lot of it is a settled issue. We've talked about assessment a little bit, but there's a lot of unanswered questions around intellectual property and privacy with these platforms that are still evolving really rapidly.

Justin - Host (05:36):

Right, that's true.

Brie (05:39):

But just the ability for every student to have slightly individualized learning, especially in a class of 220 students, I think that there's something really powerful there that we would be remiss to walk away from.

Justin - Host (05:52):

Yeah, it's interesting. It's almost like in pharmaceuticals how they talk about individualized patient care, kind of the same thing, but just on the education side.

Brie (05:59):

Absolutely. And speaking of pharmacy specifically, I definitely don't think it's a settled issue on how generative AI is used in pharmacy practice.

(06:07):

Since we're so tied to practice at Pharm Sci, I think there's a lot of potential for things to change rapidly based on how those things get adopted and what tools emerge in that space and are more widely used across BC or Canada or the world. Yeah.

JP (06:20):

Yeah. I think what Brie touched on there was the importance for privacy and security. So I think it's easy to try to jump into a shiny new tool that just comes out to say, oh, wow, we can do this now. Let's try this out and let's give it a go. I think it's important to take a step back to say what information is being recorded and by whom? How is that information being used? Where is it being stored? Here in BC, we have much more strict privacy information laws that we're bound by, so we always have to ask those questions before jumping to looking at something and just making sure that users' personal information is being protected.

Justin - Host (07:07):

Yeah, I guess it's the technology's so new and evolving so quickly that you have to be really careful with that too, right?

JP (07:13):

Yeah. New companies are being spun up every day.

Brie (07:16):

So many of them are just chat GPT with another player on top of them. So that's fascinating.

JP (07:21):

So sometimes you wonder, is this actually a new tool that can do unique things, or is it just some company trying to scrape user data?

Brie (07:30):

And I think more broadly outside of generative ai, just using technology in the classroom can kind of be that same tight rope. I want to use this new thing. It's fascinating. Can I use it in a way that's actually supplementing the teaching and learning that I'm doing in my classroom? Or am I just making this work because

JP (07:47):

Is it an improvement,

Brie (07:48):

A new technology? Exactly.

Justin - Host (07:50):

Yeah, true. It has a practical aspect versus the

(07:53):

New and shiny AI aspect.

Brie (07:54):

Right, exactly.

Justin - Host (07:56):

Before you mentioned it's kind of role in multimedia space. How do you see that evolving within your scope of work? Do you see that as useful at this point, or is that kind of farther in the future?

JP (08:08):

I think it's a little bit farther in the future right now, although that future seems to be getting closer and closer, faster and faster than what we thought. We do a lot of really cool asynchronous video creation or multimedia production, and right now it's pretty time intensive. It's a creative process. Sometimes we are creating animations through systems like beyond, or we're doing screencasts or things like that, and that requires people to storyboard and record scripts and to sit in front of a computer or a lightboard and produce videos. And that all takes time in post-production as well for editing, as you know, and getting everything and sounding and looking like you want the progression of what we're seeing right now in ai, especially in the multimedia world, I can see how that could cut down dramatically the number of hours that we're putting into this type of multimedia creation. So if we're able to spin up an animation through AI, that could cut down on dozens of hours. That's true that we spend in a creative process trying to create our own. So I could see it doing things like that. So I don't see it as it's replacing things that we're doing, but it could definitely speed things up a lot more.

Brie (09:33):

And I mean, for me, what I have found interesting is I've actually used the multimedia tools more. They've naturally become more embedded in my workflow than a lot of the text tools when it comes to making images for slide decks. Or I've made model patient images for use in some of our platforms like the VIC platform, just that level of personalizing from case to case, which wasn't possible before. I mean, we just had one image across all of these different cases, and now we can have a generated image to kind of differentiate what case you're looking at, and to let the students have a little bit more of a connection to the person behind this case, which I think is interesting.

JP (10:11):

Yeah,

Justin - Host (10:12):

Yeah, for sure. For sure.

JP (10:13):

Yeah, it's basically, if you can think of it as access to more people in order to do things where we're limited in the time that we have in the day to do things, now all of a sudden we can do things a lot faster and at a higher rate of speed to create that kind of content.

Justin - Host (10:33):

Right. Yeah. Before you alluded to the initial scary job replacement aspect of ai, but no, it's really come to enhance a lot of our work, hasn't it?

JP (10:42):

Yeah, absolutely.

Justin - Host (10:45):

So you touched on a lot of this in the past few minutes, but what is your team doing currently within the scope of AI and the faculty? If you want to add anything? I know you added a bunch already,

Brie (10:56):

But Yeah, for sure. I mean, well, a couple of weeks ago we had the letter of intent deadline for, there was a special call for generative AI related TLEF proposals. So I think there was a half a dozen, maybe letters that came through our office that we gave some advice on or work closely with those teams. So that's something that I'm really excited to see where that process goes. I think there's been a lot of really interesting ideas from a lot of different perspectives just within our faculty and to see how those proposals progress through that process or see what other things emerge across the university. I'm really looking forward to that. So that's something that I've been really excited about in our office, what we've been working with.

JP (11:35):

The first year when AI came out, it was more of like, okay, let's be a little cautious. Let's try it out. Let's see what it can do, and let's potentially see where things can fit. So we had some eager faculty that wanted to try it out in their course and weren't really sure where, how that would go. So there were a few courses where we piloted it to say, students are going to use AI to answer a few questions, and then based on the responses of that ai, we're going to have a class discussion. Was it right, was it wrong? How could we use this with patients? And that type of thing. So that's kind of where we were. It's more of an exploratory phase that first year it was out. Now that it's been a little bit longer and more exposed and more experience with the technology, now we're looking at, okay, let's see what platforms we can build with it. Let's see if we can go a little bit deeper and bigger with this and see what we can create. And I think that's kind of what we're doing now.

Brie (12:38):

Yeah. What I get really excited about is meeting with faculty who have an open-ended question, if only I could do this. I don't have enough hours in the day. Finding a way to use these platforms to help people achieve these ideas that they have that they just didn't have the resources to do. That's also something that comes through our office that I get really excited about.

Justin - Host (12:58):

Yeah. Yeah, it's very interesting. Do you find that faculty participation or faculty excitement is pretty high with regards to ai? Or is it still kind of a struggle for, because quite a bit of a change.

JP (13:13):

Everybody's interested in it. So when you mention ai, it gets everybody's attention,

(13:20):

And so people want to hear about what you're doing, but there is still that fear around it, that anxiety is still there, unsure of how to use it properly. I think that's kind of the big thing. And there are people who new technology is a bit scary, and this is a very new technology, a very big new technology. So that's there. So I think it's more of us trying to be the guide with it, not the solution with it, but more of just like, here's how we could potentially use it. And starting slow and talking to people about what we tried and what the experience was and trying to build off of that instead of just jumping in too deep at first, just going a little bit shallow and then seeing what works and what doesn't for people.

Brie (14:18):

I think it was helpful that the world didn't end six months after it came out. I think that was helpful for some people's mindset for sure. And it's helpful to try things and have them not work. That's also a really important part of using technology, and this is no exception to that role. I think that the things that you try that don't work are just as educational, if not more in many opportunities. Then things that you try that work perfectly.

Justin - Host (14:41):

Yeah. It almost seems like one of those transformative leaps we had from paper to computers and computers to the internet.

Brie (14:47):

Yeah. It's like PIA to Google.

Justin - Host (14:48):

Yeah, exactly. It's like another one of those in a way.

JP (14:51):

I will say though, I think a lot of people, because it's so new and everyone understands that it's growing so quickly and so fast, there seems to be a built-in understanding that there's going to be mistakes along the way that's good, and certain things aren't going to work, and if you are going to try this, that's a likely scenario where what you thought was going to happen didn't turn out as well as you hoped, or it's going to be different, or you need to pivot in a different direction. So I think everybody who is jumping into this kind of understands that part of it, which is nice for us because it kind of takes a little bit of the pressure off and allows us to be more experimental.

Justin - Host (15:34):

And that's good. You can, well, you can see what works, what doesn't not be afraid. So if you could pinpoint any achievements you've made within the scope of AI so far, what would you say they are?

Brie (15:45):

Yeah, I mean, I'm really pleased with the LOIs that came just from our faculty, and I think that there's a lot of ideas there that are going to be really interesting if we're given the opportunity to explore them. I think some of those ideas, whether or not the TLEF process goes the way we want are going to be explored anyways, because they're wonderful ideas that have a lot of potential to be very impactful on teaching and learning here at Pharm Sci. So whether that be platforms or if that is a series of peds course sessions to talk about AI or just looking at how students are using it in their daily lives, or how practicing pharmacists are using generative AI and taking those lessons back to our classroom. I mean, that's something I'm grateful that we have a spirit of inquiry in our faculty, and that's something that I kind of considered to be an achievement of our whole faculty is this willingness to explore.

JP (16:42):

Yeah, I think there were a couple of LOIs that came across our desk, and as we were kind of going through them, Bri and I were talking about them and just being like, what does this person want to do? I don't understand, and we're trying to figure it out based off of what we're reading. And I quickly realized like, huh, I hadn't thought of that. I hadn't thought that this could be used in that way for that purpose and how impactful that would be for our teachers and our students as well. So it is really cool to see, and that's where that's the perspective you get when you're out in the field or when you're practicing pharmacist or you're working with students on a daily basis and their pain points or things that they're struggling with, and you come up with a very novel solution using AI to try to help with that. And that's something that Brie and I, we can help facilitate and we can work with them on that, but we wouldn't have come up with that solution on our own.

Justin - Host (17:36):

Right,

JP (17:36):

Right.

Justin - Host (17:37):

Exactly. Just for our listeners, could you briefly explain what Lois and Yeah,

Brie (17:42):

Absolutely.

Justin - Host (17:43):

TLEF is?

Brie (17:44):

Yeah, absolutely.

Justin - Host (17:45):

For those who might not know.

JP (17:47):

Oh, the jargon.

Brie (17:47):

Yes. So the TEF is the Teaching and Learning Enhancement Fund. That's a UBC fund to give grant money to projects for exploring things that will impact teaching and learning broadly at UBC, not just within our faculty, but more widely across all campus. And then LOI is a letter of intent, so this is kind of the first phase. You're dipping your toes in, you're talking about what you want to explore if given the opportunity, and then you go ahead and flesh that out in a wider, more detailed proposal

JP (18:15):

This year, because there's a lot of excitement and interest around ai, UBC decided to send out a specific call for proposals just around ideas involving generative ai.

Justin - Host (18:29):

Oh, interesting. I didn't know that I should explore it myself. Yeah. So talking about the future, again, you kind of alluded to this before, but if you have anything to add, what excites you about the future of AI in your work?

JP (18:46):

I'm really excited just to see how fast things are progressing. The newest version of chat, GPT-4 oh, which can now use webcams as an input, and the demonstrations that I'm seeing with that are pretty incredible. So I don't know if you've seen the one from Microsoft where the guy held up a random page from a random book within a second and a half maybe. The AI was able to discern exactly what the book was about and what was on that page, what it was talking about, but it was able to summarize that in a very unique way. It wasn't just reading the text. And so that level of interaction with it, I think is going to, well, it's going to keep expanding, but the options that opens up for us is having multiple modes of input and being able to interact with it visually, orally, through text, all that stuff. It is pretty

Justin - Host (19:49):

Cool from an educational standpoint, it seems very

JP (19:51):

Powerful. It is, yeah.

Brie (19:53):

You wind up in a much more sci-fi adjacent future when

JP (19:56):

You're able

Brie (19:57):

To talk to it. And it's not just,

JP (19:59):

Well, now it's like, okay, it's got eyes. It's got eyes, it can, moving back to the scary part of it, but it's really cool the options that keep it growing seemingly week over week. It's really cool. So one of the key projects that we're working on that Brie and I are already involved in is a project called Gener X. And this is a project that we are pretty excited about. It's something where we're kind of trying to create virtual patients essentially through a case. So a 75-year-old male smoker or a 30-year-old pregnant female. And through those cases, they can have, they're taking certain medications or they have certain health concerns, and the students then go through that case with that particular patient. And now through ai, we can have that patient kind of interacting with our students.

Justin - Host (21:01):

Wow.

JP (21:01):

And this could be device agnostic. They can be using it anywhere on the bus, coming into school, practicing with it on their laptop. And so when we first started looking at this project six months ago, eight months ago

(21:19):

From where we were then about the technology, which was chat GPT three to chat GPT four, oh, now the things that we're now changing to include in our project and where we can go with it, it's pretty cool. The expanded ability that we now have that it can read PDFs, it can read charts, medical charts, and answer questions based off of what it's seeing. And we could have the student have a webcam on their phone, on their laptop and be able to actually speak to that AI as if it were a person. Really exciting for me.

Justin - Host (22:01):

Wow. Yeah, I know what you mean about it evolving so fast too, because I went on parental leave. It was during the core of the AI acceleration phase, which we're still in. I

JP (22:12):

Guess you're going to get an AI nanny.

Justin - Host (22:14):

I came back to work and I'm

Brie (22:15):

Like, so

Justin - Host (22:16):

Much has changed.

Brie (22:18):

It has been interesting to try on a single project that is so related to the technologies when the boundaries are changing so quickly. That's been really, really interesting. And not just incorporating it in my practice, but on one single project, just seeing how much what's available to us can change.

JP (22:35):

And it's not like a, oh, this doesn't work anymore. It's the opposite. It's just like, well, that still works, but we can also

Justin - Host (22:42):

Do

Brie (22:42):

This now. Now you do more

Justin - Host (22:46):

Now maybe on some of the negative aspects. What do you see the either negative aspects or limitations of AI right now?

Brie (22:54):

I can talk all day about this. I'm excited about this. Yeah, I mean, it raises philosophical questions for me, especially coming from, if we're looking at chat GT specifically, what's the difference between knowledge and confident communication?

Justin - Host (23:11):

Yeah, that's a big problem.

Brie (23:11):

It's not a knowledge machine. It's a machine built to provide plausible sounding responses and not a machine to provide you with information or to tell you where it is getting the information from. It's just not how it works, not how the technology works, and it's not how it was designed to work.

Brie (23:29):

It comes from the field of natural language processing. So that's all just about how to create or work with or understand text in a human way. Not knowledge, not information, but just text. So I think that that's really interesting. And this idea that we're now presented with a platform that can confidently tell you anything you want to hear with No,

JP (23:54):

It tells you confidently, but that doesn't mean that it's, right.

Brie (23:57):

Yeah. There's no citations. There's no thread that you can follow for the reasoning. No real reasoning happening. It's a really interesting, I think, foundational level hiccup that maybe we're not taking fully into account in a lot of places.

JP (24:14):

Right, right. I think one of the key things that you start to learn as you come into universities is how to do research, how to do proper research, how to find an answer that is correct

Brie (24:27):

Or evaluate.

JP (24:28):

Yeah, exactly. And I think what's kind of scary is the thought that a lot of people are taking the responses from these ais as fact without doing the research or questioning the material as everyone's kind of taught to do. And we're seeing that across the board, and that's kind of one of those things where it's like, whoa, I know it's coming across as very confident. This is it. But it's just like, well, where Where'd you get that answer from?

JP (24:59):

And sometimes you're not going to get an answer to that question. Exactly. And that's where it's kind of like, oh, okay, did you just make that

Brie (25:06):

Up? Yeah, an earth shaking epistemological threat.

JP (25:09):

Right.

Brie (25:11):

Which is fascinating that those lines are so blurry is really interesting.

JP (25:16):

Brie did this really cool presentation on, she asked an AI question and she got back and she wanted to get references set to cite your work. I think two of the references were the exact same. One of them didn't exist.

Brie (25:33):

It was like the Amazon listing for the book that it was referring to. So not the book, but the Amazon listing saw it

Brie (25:41):

A really interesting scholarly article that was only just vaguely associated with what I was talking about, but if you didn't know any better, I mean, you'd be like, well, look at this peer reviewed journal. It's like nothing wrong with the article, it's just that it's not actually related to it. And then there was a scammy adware personal blog that was the other reference that copilot thought was super relevant. And beyond that level was there was only one citation in the response that was generated. So the way these copilot says that it does citations I think is maybe something that should be interrogated a little bit more because I think it is just generating something and then adding citations in later. That's my opinion. I

don't know how it's supposed to be working, but I think that that lends some credence that maybe isn't quite deserved to these responses, but,

JP (26:34):

And everyone is, so when it first came out and that fear of there was a fear, is this going to replace our jobs? That was one thing, but here in higher education, the cheating aspect of it, right? Yeah. Students are just going to use this crazy to cheat on their exams, write their papers for them. This is going to be the death of essay writing, all this stuff. And I still think that's a very important concern, but I think it's more about educating both the instructors and the students about this exact point. It's just like you cannot rely on it to do this for you because there's most likely going to be things in there that are not correct. And you can't just take it verbatim. You have to analyze the responses that you're getting. And so I think that's one of the biggest limitations to it.

Brie (27:29):

And I think that one way that you, dear listener can think about this yourself is, I mean, ask chat GPT or ask your platform of choice for a response built on something that really, well, because a lot of the time I think you see these demonstrations and they're on a niche knowledge base that you maybe don't, can't evaluate what's happening in front of you here, but if you generate a response based on something that inside and out, I think that'll give you something to calibrate your expectations to on how accurate this is for something that you don't know that well yourself.

Justin - Host (28:05):

Yeah. It sounds like there's still no easy way to get the right answer. You still have to.

Brie (28:09):

There's no right answer for

Justin - Host (28:11):

These models.

Brie (28:12):

There's just an answer.

Justin - Host (28:14):

As a person, you have to do your due diligence still. Yeah, absolutely. Maybe that day will come one day, but I don’t know, it's getting better. Speaking of the future, how do you see AI evolving within the scope of pharmacy education? Or what are your predictions for the future, if you dare to make them? I don't like making

JP (28:34):

Predictions. Don't worry. Won't I see it being in a very effective teaching assistant? Well, teaching and learning assistant is where I see this going. I see it removing barriers for instructors to try different models of teaching. For example, we have a pretty jam packed curriculum, and in our building, we have certain rooms that are just used from eight to five, and it's just a constant turnover. And so as an instructor, you're going in, it's just like, okay, I've got five minutes. I got to set up. I got to plug my

computer in, I got to get ready, and then we got to go. I have a lot of content I need to cover. I think what this is going to do is remove that time pressure of saying, okay, I can try some different things now with my students that I wasn't able to do before. We can sit together and we can have a discussion. We can use AI to generate some content for me. I can use AI to help generate some teaching ideas or lesson plans, learning objectives and things like that that I simply just didn't have the time to do before. And so I think that's where I see this going from the teaching side of things.

(30:01):

I don't know. Bri, you have anything else

Brie (30:02):

To add? Yeah, I think dovetailing with your response, it's to return back to the idea of individualizing learning. I mean, it's not something that you a single instructor could do for a cohort of 220 people to be developing a different learning pathway for each of these students.

(30:20):

But I think this technology can help at least start down that road to identify groups of students that maybe you want to provide different content for or address in a different way. And then also, I mean, just for brainstorming, if you're reworking some of your content, it can be really effective tool to think about and get feedback from on existing content. Maybe you just want to retool part of your presentation. It can be a really helpful tool for that that can eliminate a lot of the white page anxiety of sitting there going, what am I going to start with?

JP (30:52):

If you want to do a group-based project in class and you wanted students to get together in groups, you would have to then think about what kind of questions you wanted to ask. You'd have to be creative with those. You'd have to figure out how, and you could now do all of this within an AI within seconds when it would've taken you a lot longer to do something like that. So now all of a sudden those doors are open because the logistical hurdles are gone. And I think that's what's exciting for me to see what can we do with this.

Brie (31:25):

Yeah, and I mean, we talked about it briefly earlier, but it's also just not a settled issue, like how this works in pharmacy moving forward and all the different contexts that pharmacy exists in the world, even in Canada, there's so many different ways that pharmacists work. So how is this technology helping pharmacists, and so how are we going to teach students who are becoming pharmacists to use this technology effectively?

Justin - Host (31:46):

Yeah. Well, we'll probably have to explore that in a future episode with practice. Sure. You're the education part, but the practice side of generative AI must be very interesting.

JP (31:57):

And wait a few weeks, our answers will change.

Brie (31:59):

Yeah, exactly. We can do a follow up

Justin - Host (32:01):

In six

Brie (32:01):

Months and the answers will not resemble what we've talked about.

Justin - Host (32:04):

We were wrong. I'll put a disclaimer when we actually

Brie (32:07):

Publish this. It's been three weeks since this was recorded, so it's completely out of date.

Justin - Host (32:14):

Well, thank you both for joining me. Thank you. Thank you for having us. I guess we'll wrap it up there. Thank you to our listeners, and if you enjoyed this discussion, please take a moment to subscribe to trending on your favourite podcast platform. Join us next time as we explore new and exciting topics on what's trending in pharmaceutical sciences.