Transcript for Beyond the Black Box: An Introduction to Algorithm Literacy and Classroom Considerations
BCcampus FLO Workshop hosted on April 23, 2025
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HELENA PRINS:
Well, good morning, everyone. Welcome to our FLO Workshop: Beyond the Black Box – An Introduction to Algorithm Literacy and Classroom Considerations. My name is Helena Prins, and for more than five years now, I've been an advisor on the learning and teaching team with BCcampus. And today, I'm not alone. I'm with Paula Gaube who's our tech support for the session, and I always joke about her eagle eye. She's also like an editor behind the scenes. She always finds all the details in all our sessions, and we're so thankful for Paula making it all happen behind the scenes. And I am with my fabulous colleague, Britt Dzioba. Sorry, I struggled with your last name there Britt. She is a globetrotter, and she has just returned from Spain and Morocco, right, Britt, and is going to Prince George next week. So we're just happy that you're here with us in this Zoom room this morning, and we are very excited about your session.

Before we get into the session, Britt will do a territorial acknowledgment to start us up in a good way. But I just want to remind all of you that we are recording the session. So if you do not wish to appear on camera, just keep your cameras off. You can also change your name by renaming yourself to "FLO Participant," and you don't have to speak publicly if you don't want to. There are different ways for you to participate today. The chat will be open throughout our session. But also, when we do have two options for breakout rooms, there will be the option not to go into the breakout room. So please don't leave the session when you hear the word “breakout." Britt has arranged for a choice for you each time when we get to the breakout room option. That's it for me. We will have a survey at the end, and we'll have a few announcements at the end, so hope you enjoy the next 2 hours with Britt. Britt over to you.

BRITT DZIOBA:
Thank you, Helena, and good morning, everyone. So as Helena said, I just want to start us off in a good way here. So I live and work as a settler on the traditional and unceded territory of the hən̓q̓əmiṅ əm̓ and Sḵwx̱ wú7mesh speaking peoples, which is so called Burnaby, B.C. There are several Indigenous nations who share the territory in Burnaby and all speak hən̓q̓əmiṅ əm̓ or Sḵwx̱ wú7mesh. So the central Coast Salish nations are Musqueam, Tsleil-Waututh, Snohomish, Stó:lō and Qiqéyt. I wanted to share some quotes from an online course that I'm taking right now and I have the link for that as well if anyone's interested. It's from the Canadian Institute for Advanced Research. The course, it's a free two-hour little mini-course on Indigenous data sovereignty. It's self-paced and I highly recommend taking it. If you're interested in this topic, it's a really well put together course. But I thought that these two quotes really encapsulate some of the ideas that we're going to be talking about today. The first is colonization continues today through the appropriation…. the appropriation and improper use of Indigenous

knowledges, data, and intellectual property. And “Digital colonization through processes such as data mining without contextual understanding of each community can result in bias and harm a community." So as we're going to learn in this presentation, hopefully, data is not impersonal. It has a deep connection to communities and people, and when used correctly or without context, it can result in real harm. Data is very much subjective and it's important that we keep in mind whose stories and whose histories are being shaped in our online spaces.

So this is a new thing that I'm trying out and it was inspired by my volunteer work on the BCcampus Internal AI Policy Working Group and some of the research that we've been doing there. I wanted to include a generative AI disclosure statement just to be transparent. But also, I just think it's really interesting hearing about how others use GenAI. I just wanted to contribute to the conversation because anytime I hear somebody using GenAI in a new way, I get excited and I want to try it out. So in the spirit of being transparent, I do my best to use GenAI intentionally, sparingly, and critically due to its environmental impacts, potential biases, and missteps. However, GenAI can be a wonderfully helpful tool, especially for neurodivergent folks like myself. So I'd like to be transparent in my usage. So here are some of the ways that I use GenAI to help shape this workshop. So I used it for GenAI for helping me generate preliminary outline ideas, creating plain language definitions and examples of some of the topics that we're going to be talking about today and the vocabulary, editing my script. I rely heavily on a script when speaking. We were just having a conversation before everyone joined about being neurodivergent. I have struggles with working memory. So using ChatGPT to help me refine my script is really helpful as well as generating some activity ideas.

All right, Helena already introduced me a bit, but I'm Britt Dzioba and I'm learning and teaching advisor here at BCcampus. I use she/her pronouns. I wanted to talk a little bit how I came to this topic. I've already always been interested in technology. My dad is a computer scientist, so computers were always around and we were really encouraged to play with them growing up. I've always been an eager and early adopter of social media technologies until probably about seven years ago when I deleted all of my social media, when I realized it was just destroying my mental health. It was supposed to be a temporary detox, but it ended up sticking. However, I'm still an interested observer of digital trends in social media, and it's got me fascinated about how internet trends shape our lives and how misinformation spreads. And then during graduate school, I had the fantastic opportunity to work as the project coordinator on The Digital Tattoo Project, where I got to work with Lucas Wright, who some of you might know is a hugely influential person in the AI Thinkspace. I got to delve into some really interesting projects there around how algorithms use our data and what students can do to protect themselves. The Digital Tattoo Project has tons of great resources on this topic. I've linked that project in the resource slide at the end. And I also want to know that I'm coming to this topic as a lay person. I'm not a programmer. I don't have a background in STEM. I failed high school math multiple times. I used to work in tech on the people side of things. I have a little bit of a technical understanding, but I don't have technical skill. So I'm sharing things today that I've learned along the way, but my knowledge is by no means exhaustive and without flaws.

Yeah, so I'd love to hear where some of you are coming from today. I'm going to try to see if I can see the chat. So yeah, feel free to introduce yourself in the chat. And yeah, that's one thing I kind of miss about in-person facilitating is getting to chat a little bit more freely with you all. All right. So sorry. We're going to get into the overview here. So today, we're going to talk about algorithms. It's a huge topic, we're really just skimming the surface here. But the purpose of this workshop is to get us noticing algorithms a little a bit more. Thinking about digital content a bit more critically and hopefully leaving with some ideas how to bring this literacy into your work. I also want to note that there are many types of algorithms like sorting, Brute force, Greedy, Recursive. But we're going to be talking about algorithms as a system and not the mathematical elements of algorithms. When I say algorithms in this workshop, I'm meaning the system, not this minute specific algorithm types.

All right. So there is a Padlet. So you can contribute to the Padlet at any time. As Helena mentioned, there are going to be two breakout group discussions, and if you do not like breakup rooms and don't feel like joining today, that's totally fine. You can just stay in the main room when the breakup rooms open and feel free to use that time to quietly reflect, and then you can use the Padlet to share some of your musings or questions if you wish. So yeah. Hopefully, if you don't like regular rooms, please stick around if you can and feel free to engage however best suits you.

All right. And now we're going to dive into algorithms. I also just wanted to note, I'm going to try to pause periodically to check the chat for questions if Helena. Helena will flag me if I've missed something. Feel free to use the chat. We're going to start. So I'm just going to take a sip of water here. So we're going to start by defining algorithms. So just so we start off on the same foot and have some basic definitions out there. So at its most basic, an algorithm can be thought of as a recipe. So think of it as a recipe that provides clear, unambiguous instructions that can be followed to achieve a desired outcome. So a recipe for chocolate chip cookies is technically an algorithm. A more dictionary approved definition would be that an algorithm is a step-by-step procedure or set of rules designed to accomplish a specific task or solve a particular problem. In the digital world, algorithms are instructions that tell computers how to process information and make decisions. They take inputs, so that would be data, perform specific operations on that data, and produce outputs being the results. For instance, social media algorithms take information about what you've liked or viewed in the past. Those are the inputs. They process this information according to certain rules, and then they decide what content to show you next. That would be the output. What makes algorithms powerful is that they can process vast amounts of information very quickly and consistently. However, sorry, they're limited by how they're designed and what data they're given, which is why understanding them is so important because they shape so many aspects of our digital experiences, but reflect the priority and biases of their creators. I'm just going to stop to check the chat here. Okay. Oh, yeah. The social media detox? Yes. That's been a huge impact on my mental health. Thanks, Shane. All right.

This is just a visual representation of an algorithm just for those of us who like visuals. You can see you got the input moves into the set of rules that the rules are dictated by what the expected output is going to be for the given input and then the output.

Where do we find algorithms? They're everywhere and anywhere. Some of the examples, these are just the ones I thought of off the top of my head and it's by no means close to exhaustive are GPS, Google search results, facial recognition on your phone, any YouTube, Netflix Spotify recommendations, traffic lights are run by algorithms. Making a sandwich is technically using an algorithm. Chatbots. I included that one because I had a very frustrating experience trying to use a chatbot with my mobile service provider. Very annoying process if anyone has had to do that lately. But another big example of where we're going to see algorithms in use, and it's obviously a topic du jour is generative AI, tools like ChatGPT, Cloud, Copilot. These are really poignant examples of programs that use machine learning algorithms, which we'll talk about a little bit later. But yeah, I wanted to mention those. But I also wanted to say that generative AI tools and algorithms are not synonymous terms. AI and algorithms, although very closely related, are not the same, and we will talk about that a little bit later.

Okay, now that we have a common definition of algorithms, I'd love to know using Menti, there should be a link in the chat there or you can use a QR here. What are the algorithms or sorry, where are algorithms most prominent in your daily life? Just think of one or two examples where you really feel like, Okay, I see where the algorithms are algorithming in my daily life. I will open up the Menti. I'm hoping I can. I'm just going to stop sharing for a second here and then share. That's the Padlet.

Here's the Menti. Yeah. Search engine is a big one. Yeah. GPS, yeah. Yep. News, online shopping. That's a big one. Mm hm. Bands, I love. I know I find the Spotify recommendations so funny because sometimes they're amazing and then the majority of the time they are just so off. I don't know if people heard, but over last year Spotify laid off a number of workers that worked in their creative department putting together these custom playlists and they've actually now use algorithms to create a lot of these playlists and it has had quite a bit of backlash for understandable reasons. Yeah. Advertisements is huge. Advertisements, that's where you're going to see making you buy stuff. Yeah, I think one thing, especially with search engines, that's one of the one of the first things I learned about algorithms that was an aha moment for me and why they're important to learn about is the way that Google presents their search results. Google has done a lot of work to really streamline their platform and make it this very minimalistic, you know, simplistic looking platform that kind of tricks your mind into thinking that it's unbiased because it's so plain and minimal and, you know, they've removed a lot of the I feel like it's coming back. Some of the business is starting to come back into Google, but there was a time a few years ago where it was very plain. Like they didn't have all the ads down the side anymore. And I think that kind of lulled people into the sense of feeling like, Oh, well, Google is so unbiased. The search results that appear at the top, like those are the most

reliant reliable. Without realizing that there are very complex and deep algorithms that are actually shaping what you see at the top of the list and that, depending on where you are and who you are, you're going to get different results from the same search terms. I'm just going to go back to PowerPoint here. Okay. Great. Listen. Sorry. Okay.

All right. I had mentioned before this topic of machine learning. This important term to note because this type of algorithm, machine learning algorithm process really is important in AI. Machine learning is a type of artificial intelligence that enables computers to learn from data and make decisions or predictions without being explicitly programmed for possible situations. A simple breakdown would be traditional programming would be you write rules, that being code, you feed data in and you get answers out of that. That's a very traditional algorithmic process. With machine learning, you feed the computer data and answers, and it figures out the rules on its own. So machine learning, sorry, machine computer system can learn patterns from data without being explicitly programmed. And one of the examples of this is CAPTCHA, which I actually only just learned, sorry, CAPTCHAs are you know when you log into a site and it says, click all the images that have a motorcycle in them and you go through and you click all the images and you say, I'm not a robot and it lets you in. I actually I didn't know that CAPTCHA stands for Completely Automated Public Turing Test to tell computers and humans apart. That is quite a mouthful. It makes a nice little acronym. This is actually a process involved in machine learning that you as a human are actually partaking in because you are helping computers learn the rules of what differentiates a motorcycle from a human being. That data can then be used later on in self-driving cars as an example of how this process works. So in simple terms, rather than a program writing out detailed rules for every situation, the machine learning algorithm figures out the rules themselves by analyzing data and patterns.

So there are actually three well, there's more than three, but these are the three main types of machine learning that I think are important to think about, which is supervised learning. That's task driven, trained on a dataset. This would be used commonly in fraud detection, weather analysis, and risk assessment. So if meteorologists wanted to learn more about tornado patterns, they would feed the system a lot of data about tornadoes in the area and tornado history. So unsupervised learning, so it's data driven and the algorithm draws inference from unlabelled datasets. So, this is common in pattern recognition and predictive modelling. So that being recommendation systems. So customers who bought this product also bought this product. So the unlabelled datasets, this would be just like a massive amount of data, and then the machine pulls out and makes inferences, it draws connections on its own. A little bit more open. And reinforcement learning, which is feedback driven. That would be a video game. When an action happens, there's a consequence to the action. This is a programming common with working with robots and trying to get them to mimic human behaviour. A very simple example of this is when you use ChatGPT at the bottom, you might have seen there's a plus sign or sorry, a thumbs up or thumbs down, and that's reinforcement learning, you're helping ChatGPT learn whether you liked its answer. All right.

I think that we can now see that data is really what drives a lot of how algorithms function. Data is their food. Algorithms need data to learn and grow and thrive. One of the books that I read quite a few years ago that really got me interested in how data is used and how it's used against us is Harvard Business School Professor Shoshana Zuboff's book, "The Age of Surveillance Capitalism." Just a light summer beach read recommendation for you all there. Just a short 600-page book on data surveillance. There's a lot to go over, more than I can cover in this one slide, of course. But I think this quote from Shoshana Zuboff really encapsulates what the book talks about, which is “Surveillance capitalism unilaterally claims human experience as free raw material for translation into behavioural data." And I think this quote really encapsulates how we are a product. Our data is the product and our behaviour creates a bunch of data. That is very valuable and useful to a lot of companies that are building these algorithms. There's also a great quote by the computer scientist and tech ethicist Jerome Lanier, and he says, "If something online is free, then you are the product." I think that sums up well how valuable our data is to companies that build algorithms. It's why Facebook and Google products and many GenAI tools are free. We give trillions of terabytes of personal information every day for free on the internet and this can be harnessed into huge amounts of money for companies or invaluable datasets for governments. So I'm just going to stop quickly for I think that my computer is not liking it.

All right. This leads to the question: If machine learning and many algorithmic systems in general are reliant on mass amounts of data, where are they getting this data? Well, unfortunately, we don't always know. Even the software engineers that build these systems don't really know. Of course, we do know when we put in information to Facebook or Amazon purchases or Google or Google search results or anything we put into ChatGPT, we can understand a lot of data around us coming from that. But we don't quite know how it's being packaged or repackaged or how it's being used. So some governments are trying to force companies to disclose the datasets that their algorithms draw from, but this has proven much harder than previously thought. As this quote from the" MIT Technology Review" states, "Disclosure policies might be impossible even for systems that seem relatively simple on the surface, such as apps and websites that use deep learning to serve ads or recommend songs. The computers that run those services have programmed themselves and they have done it in ways we cannot understand. Even the engineers who built the apps cannot fully explain their behaviour." This is what we mean when we talk about the black box of algorithms because even the people who are building these machines and these tools, don't quite know how the algorithms or the data what datasets the algorithms are pulling from. Because as you can see from my example before unsupervised learning, sometimes they're just getting fed mass amounts of data that have been bundled together from multiple different sources and the algorithm is using that to learn from and then it's building off of that learning to re learn and it gets more data and it learns more and more. You can imagine what a tangle of information this is; it would be nearly impossible to untangle that web. So to me, this is why algorithm literacy is so important because we may never get to look inside the black box, so to speak.

We need to equip ourselves and our students with as much insight as we can and instill a culture of critical engagement with these tools. I thought that this was a pretty thorough definition of algorithm literacy that I pulled from a research paper, and it states that algorithm literacy is "being aware of the use of algorithms in online applications, platforms, and services, knowing how algorithms work, and being able to critically evaluate algorithmic decision-making, as well as having the skills to cope with or even influence algorithmic operations."

So what I like about this definition is that it can be extracted into layers of understanding. I've definitely noticed some similarities with Bloom's taxonomy of learning here and the structure that we have. The first level being awareness and knowledge, so that's being able to define algorithms or general knowledge of their existence, then moving into critical evaluation, assessing and analyzing algorithmic output, understanding algorithmic bias exists, and maybe starting to recognize where digital echo chambers are popping up. Coping strategies, protecting oneself from harms of algorithm and data harvesting as best as you possibly can and pushing back against algorithmic bias wherever possible. Then the fourth level is creation and design skills. Creative engagement with algorithms or maybe even the creation of algorithms or knowing how to create content in an algorithmic heavy environment.

Okay. I just wanted to show the relationship between digital literacy, algorithmic literacy, and AI literacy. This is the way that I've conceptualized the relationship, and it's just totally my own thinking and not necessarily how everyone else might conceptualize it. So people might construct a relationship hierarchy differently or not as a hierarchy at all. I don't really think of this as a hierarchy of importance more than I think of digital literacy as the umbrella and algorithmic literacy falls under it and then AI literacy is a branch of algorithm literacy, but what these literacies share in common is that they're all critical literacies needed to foster effective digital citizenship, and all of these literacies are more than just using the tool. It's not just Google searching, it's not just about knowing how to use ChatGPT but how to do so ethically, critically, and effectively, and engaging and analyzing with these tools. Sorry, engaging with these tools and analyzing their outputs. And I just wanted to note that algorithms and AI are not synonymous terms, which is why I have them separated into their own literacy subcategories. AI is the broad concept of machines being able to carry out tasks in a way that we would consider smart or intelligent. It's about making machines mimic human cognitive functions, learning, reasoning, problem-solving, understanding language, perception, etc. So examples of that would be ChatGPT, self-driving cars, facial recognition, recommendation systems like Netflix or Spotify, AI uses algorithms, but not all algorithms are AI. Like I mentioned before, making a sandwich is technically an algorithm, the recipe to make a sandwich is an algorithm, but that's not AI. AI is the goal, so making machines smart, and algorithms are the tools to reach that goal. That's the important differentiation here.

Okay. A large part of critical digital literacy like algorithmic literacy is understanding the ethical issues behind the tools. So we're going to start a conversation about algorithmic bias, but first I wanted to show this short video by Canadian American computer scientist and poet Dr. Joy

Buolamwini. And her research primarily focuses on gender and racial inequality in data science. We tested this earlier and the sound worked. I also put on CC captioning. But yes, flag me if it's not.

VIDEO STARTS:
I have a confession. Sometimes with no one in sight, I code in a white mask. As I make whimsical systems to paint walls with our smiles or project inspirations on faces, I enjoy using code to make my ideas a reality. Computer vision powers my creation, making it possible for machines to detect faces. But at times, I'm invisible. You see, machines view the world through a coded gaze. They digest pixels from a camera in dictated ways. Using machine learning, we create training sets with examples that help the machines detect new faces. A lack of diversity in these training sets leads to limited systems that can struggle with faces like mine. To save time, code libraries for facial recognition are shared like off-the-shelf parts. Many computer vision projects share the same code. Any bias in the system propagates widely and implants a coded gaze. The coded gaze reflects the views of whoever creates the systems. All of our work reflects both our aspirations and our limitations. Can we do better? Yes. We can begin by intentionally creating inclusive code. I call this InCoding. InCoding is a mindset that asks, who's missing? Detecting the invisible is easier when you have full spectrum teams equipped with different life filters. Who codes matters. InCoding is a process that explicitly checks the impact of bias during the design, development, and deployment of coded systems. How we code matters. InCoding is a personal mission and an invitation to create a world with a culture of inclusion, a world where technology works for all of us and centres social change. No more masks.
VIDEO ENDS

BRITT:
I think that she also has a full-length feature documentary that I believe is on Netflix still. I highly recommend watching that as well or just following her work. But I think what she says in that video, how we code matters is a really important thing to think about when thinking about code because I think often code gets conceptualized as objective and it's math and numbers and numbers can't be bias, which is not quite true. There's a lot of subjectivity that can go into coding, and we also have to think about who is creating the datasets that these machines are being trained on because those humans are making real choices about what data is included and what data is left out and who is included and who is left out. Algorithm systems are increasingly influencing students' academic trajectories, making critical understanding of algorithms not optional, but really essential for protecting our students and helping them protect their own data as well. So one of the major examples of algorithmic bias and harm in higher ed is proctoring services. So this links to what Joy speaks about in the video. So this graph on the left shows Proctorio, a common proctoring service that detects black faces less than half the time, as opposed to other to white faces. And when we think about, when we think back to the conversation about machine learning, these softwares are learning from this data and learning from one another because often new software in similar fields will build off

the same datasets. So if students of colour are being flagged for cheating at higher rates because the software can't detect their faces, what is that training the algorithms to pick up on? So this is just one example of bias in educational technology tools, but the list of Edtech tools with AI integration and those that rely on machine learning is growing, and we need to think deeply about what data are they prioritizing? What are they learning from? What constitutes a good assignment in an auto grading software per se? And why? Who are they leaving out?

So just to kind of encapsulate a few of the points I hope to have made, algorithms are not neutral, they're not magic, and they're not without error. They are created by humans. Even if they seem very neutral, there's not a lot of neutrality that goes into the creation, and they're also self-perpetuating. The data that's put in helps inform the data that's then created, and then that data is used to create more algorithms, so you can see how this grows and grows and grows. And it can be very difficult to pinpoint in the system where things went wrong. We're going to have an activity a little bit later on, which is going to be a really good example of how difficult it is to figure out to catch our own bias in the process as well. So we're going to move into our first breakout room activity in a second here.

I'm just going to use the example here of automatic essay grading softwares. These softwares allow instructors to usually batch upload assignments into their software, and then the algorithm will read through and suggest a grade and suggest feedback. So one of them is a paid software, so that's Essay Grader. The other one is CoGrader. You can use any, it's just the concept really we're going to be thinking about, but feel free to Google them if you want to know a little bit more. So in groups, so we're just going to open breaker rooms, just in your group, we're going to discuss what issues can you see with these types of technology, particularly around bias, how bias might be perpetuated. But feel free to talk about other issues with these softwares, such as privacy, a little bit more about the algorithms that might be influencing them and use the Padlet. There should be a column in the Padlet. I think it is called Automatic Essay Grading and you can click to add your thoughts and questions or group musings. Then again, if you don't want to join the breakout room, feel free to stay in the main room and you can just contribute to the Padlet on your own. I'm just trying to figure out how much time do we have. It's 10:30. Let's take about 10 minutes in our groups to talk about automatic essay grading tools and what are some of the biases that can come up there. Paula will open the rooms for you.

Awesome. I was keeping an eye on the Padlet contributions there and I'm seeing a lot of really excellent points and things that I have thought about as well. I'd love to open the floor, and if anyone wanted to share what their group talked about or have any insights, you can either unmute or pop it in the chat or keep using the Padlet.

DWAYNE:
Yeah, we just talked about stifling creativity. Students thinking outside the box or whatever, it's

based on what new ideas. Then obviously, a lot of these websites are based out of probably the US. There's obviously going to be biased Canada, which is different than India, which is different than Russia, so yeah. Yeah, stifling the creativity and then sarcastically, I also said that takes teacher out of the equation and the student because the students may be trying to get ahead of the game by utilizing AI and the teacher is doing the same thing. So what's the point sometimes?

BRITT:
Yeah, that's a good point. It's like if the students are using AI and the teachers are also using AI, it's a battle of the AIs, basically. But I think a few people have mentioned the Padlet, too. I think that's such a great point that it really does stifle creativity. It de-incentivizes students from taking a creative risk or trying something new. Because if the dataset isn't trained to recognize structures outside of traditional essay formats or traditional Western knowledge, it's probably not going to either recognize that content or it's not going to come back with, you know, a good, suggested grade. Of course, a lot of these software say, oh, well, you know, you still have to double check the work and, you know, this is just to help instructors relieve, you know, some of the preliminary work. But I would also push back on that and say, well, at some point, if an instructor is using it, they're going to start developing a bias because if the software that they're using is constantly coming up with, hey, these are A papers and these are C papers, over time, I really do feel like that changes your perception, no matter how much you think that it doesn't. I think we are a lot more influenced by these tools than we maybe think. Yeah. Did anyone else want to add anything? I noticed somebody had mentioned the Padlet about international students being unfairly graded by these softwares. I think that just goes back to what datasets it's pulling from? Is it pulling from mostly Western educated students who grew up in the US and know the US school system. That's what it's training itself off of. Also, somebody else had mentioned grammar errors, grammar errors could be flagged as being by the software sign of poor writing where that's not necessarily the case and it really it would have a huge bias against international students.

DWAYNE:
Yeah, I used to use the example of Margaret Atwood. She is an amazing writer, but she required an editor because she wasn't a great speller. So I think of that, honestly, the creativity and then there's the editor part. Are you getting marked as an editor or a creator? Exactly. Yeah. Yeah, Is grammar what you're really marking for or is it the content? Yeah.

EVA:
I think there have been lots of different points in recent years that have called into question the usefulness of essays as our main assessment strategy for learning, and this is one that might actually, I think, the prevalence of AI, GenAI is maybe something that will finally kind of push education towards more creative and meaningful assessment instead of just writing an essay, writing an essay about this. That's the default all the time assessment strategy.

BRITT:
Yeah, definitely. All right. So in the interests of time, I'm just going to wrap up this session for this part of the session before we take a break.

Great. So hopefully in the first hour, I was able to convey a little bit about why algorithmic literacy matters. I distilled it into a few points that by no means is this exhaustive, but these are just some of the points that I feel are valuable. I think algorithm literacy really helps promote informed digital citizenship, so helps us take control of our own privacy and our data. But also when we know how the system works, it helps us hold systems accountable to bad behaviour and engage more critically with them. We can also help ourselves and our students move from being a consumer to a creator, or not everybody wants to be a creator. So at the very least, an informed, critical consumer of content. So not just blindly accepting the content that's given to us, but actually starting to interrogate these recommendation systems. And, you know, why am I getting this content, and what content am I missing out on? I think building algorithm literacy helps us respond to the complex, rapidly changing digital landscape. I'm sure we all know it's just every day, there seems to be some new tool being released. So having those strong foundational skills helps us respond quicker because we've already built up some of these critical tool sets that even if the tools change, the concepts are very similar and we're still able to critically respond. I think improved algorithmic literacy equals improved digital literacy. Even though I think digital literacy is the overarching literacy. Literacy, improving some of those skills is really going to help your overall digital literacy. And for students, one of the benefits of that could be creating job-ready skill sets. There's a lot of research to show that digital literacy is one of the top skills that employers are looking for, especially around AI usage. So these are just generally great skills to have whether you're, you know, in school, looking for a job or out of school.

So, I just wanted to give us a 10-minute break here. So, feel free to turn off your screens, grab a drink, whatever. And then when we come back, I'm just going to talk about some classroom considerations, and then we will end with a really, really fun activity and then wrap it up.

I think that was 10 minutes, so I'm just going to share the slides. I'll just give everyone a minute here to get back. Okay. Before we move into the activity and final wrap-up, I wanted to just talk a little bit about some classroom considerations, and I had a different slide for this

I had four things that I thought about when considering integrating AI or sorry, algorithmic literacy or also AI literacy into your curriculum or into your work. So kind of I mean, maybe how I've tried to structure this workshop as well. Starting with the why would be helpful. Connecting algorithms to daily life. As we talked about at the beginning, all the ubiquitous ways that algorithms appear. Somebody mentioned in the Padlet about search engines for academic articles. They work as a librarian, and that's such a good point because I think that's somewhere that students don't really realize that algorithms can have a major impact on the content, the academic content that they're being exposed to, and that's a place where a huge amount of

bias can be perpetrated, which is what academic articles are being referenced and reshared frequently and which academic voices are being buried under these algorithms. Another kind of chat would be discussing how algorithms influence decisions in society. So data privacy is a big one. But yeah, I think really connecting the why to students' daily experience is a good place to start, then layering the learning. So starting with just knowing or defining algorithms and giving real world examples, moving into how they influence our lives. Again, showing real ways that they can perpetuate bias, and then moving on to how do we strategies for coping with algorithms and how do we create an environment that's heavily influenced by algorithms.

One of the things I would also touch on is ethics. This is related to level 2 on the last slide. And again, as I mentioned earlier, algorithmic bias and research search engine results. I think that's something that isn't talked about very frequently and yet is something that has a major impact on students' day-to-day academic life. And I think also being very transparent about where you think algorithms are appearing in your learning management system. So I've definitely seen the AI integrations are coming up for a lot of learning management systems. Algorithms are being used to collect and transpose data, student data in learning management systems. So I think taking a deep look at some of the educational technology tools you use and starting to critically reflect, Okay, where are algorithms maybe having an impact on the data that I'm seeing and how might that impact the way that I interact with my students? And being transparent about that. That can be a really great co learning experience to peel back the layer and show students where algorithms might be impacting their academic life behind the scenes. And one of the ways that you can kind of conceptualize some of these ethical considerations is this critical questioning framework, thinking about who created this algorithm and for what purpose. Obviously, we may not be able to figure out the exact software engineers that created the algorithm, but you can maybe critically dig into some of the companies that are creating these tools. What data was used to train it if you can find that information? Who benefits and who might be harmed from the information that these algorithms present. What values are encoded or might be encoded in the design that you can see based on some tinkering with the tool. Are there any alternatives or what alternatives exist? That helps to burst a little bit of the echo chamber bubble that there's only one tool, there's only one search engine comparing and contrasting between some of the different search engines to see what results you're getting.

And then lastly, is to incorporate discipline specific examples and activities. Sorry, I know the text is very small here. The slides are going to be shared out. I've just kind of dumped these in here, so people can kind of pick at whatever is of interest to them, but, you know, really thinking about your discipline and where algorithms might appear and what software is being commonly used maybe among professionals in that industry. And finding ways to help students critically engage and think about some of the information that is perpetuated by these systems. Again, these slides will be shared out, so you can take a deeper look. These are obviously not exhaustive by any means. These are just some ideas to get you started thinking about ways that you can incorporate a little bit of algorithmic literacy into your course content without having to have an actual fully dedicated module on algorithmic literacy unless you want to do that.

All right, so now we're on to the very fun part. I probably played this game six or seven times yesterday alone. This is a game called Survival of the Best Fit. So it's the link should be put in the chat for you all, and it is a click through game. So you can do it on your cell phone if you want. You just would want to turn it. I'll tell you to turn it to landscape mode, or you can play it on your computer or a tablet. It should take you about 10 minutes. It says 6 minutes, but I've given 10 just if you want to take a little bit longer to read through some of the things. To start the game, you should see a thing that says, Click on the "Start Game" and just make some mental notes of your feelings, your thoughts, your actions as you go through the game. Just a couple of things. With the game, you can either have the sound on or sound off the sound does not have any impact on the game. There's no information transmitted through sound. Yeah, it's a clicking game, you're only going to need to click through by selecting resumes, choosing between responses or clicking on objects. I've just shown in this photo here on the left. This part confused me the first time I played it, but when this screen pops up, it'll ask you to click on the CB all, so you just click on it. You don't have to drop and drag it, just click it and it will continue on. So just to note, only the beginning part of the game when you're selecting resumes is going to have an impact on how the game plays out. After that, you're going to get these pop ups that have usually two answers you can select between. Don't worry too much about what you select. That's not going to have a big impact on how the game actually comes together. So definitely read through what the question is and select which one you would like, but don't worry too much about that impacting the gameplay. It's really about the first little bit of the game. Then, I'm going to give everyone 10 minutes. Feel free cameras off and play the game through and then just think about your thoughts and your feelings and your actions. Thinking about bias as you're playing this game. And then when we come back, we're going to do breakup rooms and I have a few questions, and then after that, we'll end the session.

All right. So hopefully everyone had a chance to at least play with that game a little bit. If you didn't make it to the end, that's okay. I'll just note at the very end, there are some great resources. They provide further reading if you're interested. But yeah, I just thought that it's just a very unique game, kind of fun, and I think it's a really good example of just of hiring bias, but also how algorithmic systems work, and just some of the pitfalls in algorithmic systems, especially when it comes to really important things like hiring or school admissions is another one that uses similar algorithms. So I have a few questions here up on the screen. These are just suggested prompts for small group discussion, but we will open the breakout rooms, and then in your breakout groups, just started talking about what did you think of the game? What were some things you noticed? I don't know if you were like me, you got really stressed out when the timer started going. Even though I've played it quite a few times, it always stresses me out, thinking about what traits did you prioritize when selecting candidates, what influenced your decisions as the game progressed? Did your behaviour change as the game progressed and where might processes like these one like the one in the game show up in higher education or elsewhere if you want, as well. This is just an opportunity to reflect on the game in a group. And again, Helena said, you don't need to join a breakout room. You can feel

free to quietly reflect in the main room and just contribute to the Padlet, if you'd like. I put these questions in the Padlet so that in your groups, you can see the questions, the discussion prompts as you're chatting. And then after we'll come together for a group debrief and yeah, final reflections.

Great. So what did everyone think of the game if you were able to play it? I know some people might have had an issue if their server was blocking the game. So sorry about that. But yeah, those of you who were able to play a little bit of it, what did you think? Or what did your groups discuss alternatively?

HAJIME:
So kind of relate to the last question, where my process like this one in the game shows up in education? It's my worst nightmare in my profession. It's like the conversation with the engineer, you're given two choices that you don't necessarily agree with. You have to get in the mode of pick the best out of the worst options. You don't necessarily have the say and hey, these options are not right, and then you keep making those going to this spiral, bad decision after bad decision leading to this PR nightmare and ethical problems. I found it that it's not necessarily I'm saying it happened in my institution, but definitely I see it as a realistic possibility if humans stop doing their job and instead trying to rely on the computers, then definitely that's something that we have to really be conscious about and it was a really, really uncanny realistic representation of the worst case scenario, nightmares.

BRITT:
Totally. I think you make a good point that if we get into that system, it's really hard to get out of it too. And when bad data goes in, you can see how quickly it spirals and it can be really hard to undo some of that work. It makes me think of a lot of universities and colleges are relying on algorithms for school admissions and allocating scholarships and funding. And at some point, if you become so reliant on it, can you stop using it? Can you just say, Okay, this is a broken system. We ought to go back to how we were doing it before. I think it could be really hard to backpedal on some of these systems. Did anyone want to talk about the process through the game if they noticed their behaviour starting to change. I don't know. The more stressed I got, I noticed when I play the game, I just only am looking at one level skills. We were talking about that in the group that I joined in. It's like, who has the best skills? I'm not looking at anything else. I'm just hiring those people because I only have 30 seconds left.

EVA:
That was definitely, with the time pressure, you could see how it would be easier for bias to enter into your decision-making or also that you would be less thoroughly investigating multiple different aspects of a candidate. You're just looking at one aspect because that's what you have time to look at. Yeah, we also talked about the, this is especially true I guess of unsupervised machine learning is that there's lots of biases in an unrepresentative sample that it could learn off of and lots of patterns that it could find that an engineer or a designer might not have

anticipated. So having to begin with an unrepresentative sample that has potentially patterns that can turn into bias that you might not have predicted is a dangerous part of unsupervised machine learning.

BRITT:
Yeah, totally. I remember the first time I played the game, one of the things that I didn't realize and I was like, I feel like I was trying to be fair with my hiring. But it points out at the end, it's like, well, if your company hired a bunch of the orange people at the beginning of the company and it just happened to be who you hired. Then that's in your hiring data, which you then way later on give to this algorithm, it's created, it's learning from that. Even if like, you were when you were at the beginning of the process trying to be unbiased and fair and hiring based on a mix of skills, if you by circumstance, ended up hiring more orange than blue, then that, you know, sets off a pattern. And it's really I didn't even think about that. You know, I didn't think that maybe more of the orange people are applying for these roles. So they're going to be overrepresented in the data as well. Yeah. So anyway, it's a very stressful but fun game. Yeah, did anyone else? I'm just looking at the Padlet too. Hiring and admissions, research decisions. This is some big areas in higher ed that these kinds of algorithms can show up. Funding, I know, is a big one, students who get scholarships. I was reading an article that a lot of these funding algorithms will prioritize families that they feel are from places that can afford basically higher income families to actually receive some of this funding. You're getting a skewed cohort of students that are from upper middle-class families that are getting funding instead of being more equitably dispersed. Because it's trying to figure out the algorithm is trying to prioritize students that they think are going to stay in the system. It's decided, oh, these people are from a higher financial background. So let's continue to give funding to them because those are the people that are going to stay in school. And it self-perpetuates after.

SIMONE:
It reminds me just about technology in general and how I always say to my students, this is a tool. I teach international students and they're coming from a completely different culture. They're so desperate to fit into Canada and to get jobs here that they're highly reliant on the technology of AI and generative AI. Writing cover letters, for example, for a job application. They're so highly reliant on it and for good reason because it's all new to them, right? And so I'm always reminding them that these are always just tools and that there's so many things that, you know, use that to start your letter, but then read that letter. Does it sound like you? Is that something you'd say? And they say, Well, if it's what they want me to say, you know, they're so heavily dependent on that. And it just reminds me all the time of, of, you know, this game was a good example and some of the things you mentioned in this seminar is that to think of the underlying things that are going on, and it's not always nefarious, but often it is just because of the circumstances. And so it yeah, it's in general always to use technology, but it can be used for good or evil or anywhere in between. And so to take that to always be looking for that bias, I think. So but that's easy for me to say, as educated in this country and all that sort of

thing, and somebody coming in, I can completely understand why they would be so reliant on it. That's where my challenge comes in is, how do I help them bridge that gap?

BRITT:
Yeah, thank you. Yeah, it's helpful. Yeah. I think it reminds me of what we were talking about earlier. It's some of these tools just really remove the creativity, it de-incentivizes creativity and authenticity of being yourself, especially if you're not from, you weren't raised in Canada because a lot of these datasets are trained on Canadian or American cultural norms. So it's sad because we're removing the individuality. Did anyone else want to contribute?

TARYN:
I would also like to add that certainly the way we have just our resumes that people send in have always been very conformist and, you know, I love to say, Hey, send me a really cool resumé, you know, be as funky as you want, whatever, but we have a standardized way that we do it and, you know, whatever. So this isn't completely new, this sort of bias, obviously, you know, but it's been there for a long time.

BRITT:
Yeah, I think that bias that already exists is then being just basically it's not like the tools created the bias, per se. It's that we already had these biases, and then we create tools that perpetuate the systems that we already had without stopping and thinking, Hey, maybe before creating these tools, so we evaluate the systems that we have in place and is this an opportunity to change some of the ways we do things? Yeah, I think a lot of it actually it kind of speaking back to Tristan's point is just quickness and ease. In the short video I showed about the uncoded bias, she talked about how a lot of these systems need a lot of data and it's easy to just grab them from GitHub, which is an open source platform where people can upload data because it's easy. I think we've fall into that trap. It's like this is the system we've created and let's just recreate it in technology because it's simpler to do it that way instead of actually trying to tear down some of these systems with technology. I see we're coming pretty close to the end, but I wanted to anybody else had some final thoughts? Eva.

EVA:
Yeah. I'm a librarian and we just have these one time in a semester where you can drop into a class and talk to students about search strategies and citations. Sometimes if I have enough time in the session that I'm teaching, then I'll try to talk about search algorithms and the biases that can be repeated in search algorithms. But I mean, I'd like to get into also how algorithms work and then how those are used in GenAI. But it feels like that's like a course and that there could be a whole critical information and digital literacy course that I was just wondering if anybody has experimented with just putting little sprinkles of this in their classes or sessions that they teach if anyone knows of a post-secondary institution that's doing a really cool course or other ideas about I think this is all really important for students to learn and I don't know where or how they're going to learn it.

BRITT: It really could be an entire course.

EVA: That was too big of a question. No ideas for it. Okay.

BRITT:
I mean, yeah, my suggestion is trying to find ways to link it to the existing course content. But again, it's like do you start at the beginning? Do you start by okay, here's a whole thing about algorithms. How much time do you even have to get into just defining algorithms? How much you can't really assume prior knowledge. So yeah, it is challenging. I think, do the institutions hold responsibility to ensure that, you know, all students have to take English 101, they have to take a digital literacy 101, which is something I have very much advocated for. UBC has a digital literacy micro-credential that's automatically uploaded into their Canvas that students can take. But as far as I'm aware, it's not incentivized to take it. And so it's really like if students want to and it does get into some of the more critical digital literacies. But yeah, it's a big question. Yeah, I agree, Nessa. It's all of our jobs to create informed digital citizens because who we are. We're all digital citizens. Yeah, Simone.

SIMONE:
I would just say that the institutions that I've been working in, I think the majority of the focus has been on ethics as in you can't use generative AI in the English courses. It's not acceptable. It's more about the rules and regulations about using it for work submission, assignment submission. And there certainly is, you know, some workshops here. Here's an hour on what generative AI means and that kind of thing. But I think the focus, you know, when generative AI came out, there was a panic across institutions that students would be using that for their assignment submissions and not doing their own work. And that seems to have where the focus has been. But I think that's shifting as we're recognizing just like, we went to computers from typewriters and all those sort of things that, we can't stop this. And so let's see how we can use this and how students can use it successfully and we can use it as instructors and that kind of thing. I think we'll see even more of those workshops and those courses and those things coming up. But I think the immediate the first wave of it was this is the end of education as we know it, which we've heard in numerous generations of things. When I stopped using the card catalogue, it was a big deal. Went to microfiche. That was the end of education, right? So yeah, I think we will see that increasing. So just a ray of hope there.

BRITT:
Yeah, I agree, Simone. I put in the chat. I wish Marta was here earlier and she dropped out, but she's really an expert on this topic. She was one of our research fellows at BCcampus and she created the Algorithmic Awareness Toolkit. I pop that in there and it does have some good micro-lessons or ideas for instructors and how to talk about this topic and integrate. I've popped it in there and it's open access and open education Pressbooks. And yeah, we've come up to noon, and the slides will be shared out again, the slides that you got this morning so

sorry, they are not the updated ones. I have the updated slides, and those will be sent out. And the last slide has some resources that I found helpful. I've linked those at the end there if you are interested in learning more about this topic. Paula has popped a survey link in the chat, and those surveys really help us inform future programming. But thank you all for coming today, and I love to talk about this topic. So if anyone's interested in chatting more about it, please reach out to me anytime. I'm always happy to talk digital literacy. Information literacy, algorithms, AI, love it. So yeah, please reach out. But otherwise, have a great day. Thanks so much. Thank you.