

## Unpacking Machine Learning: Part One of Two

Welcome to *Unpacking Machine Learning: Part One of Two*. This is so exciting! We are just overwhelmed with the response—more on that later. My name is Carol Arcus, and I'm a director in the Association for Media Literacy. If you want to look me up, you can find my CV on [AML.ca](http://AML.ca). I'm going to ask my colleague, Neil Anderson, to introduce himself.

"Hello, my name is Neil Anderson, and I am the President of the Association for Media Literacy. I am really glad I'm here, and I'm really glad you're here. Let's briefly have a look at our agenda. It's basically in three parts today, three equal sessions. I'm first going to do a land acknowledgment, and I will read it."

"We are grateful for the traditional Knowledge Keepers and Elders who are still with us today and those who have gone before us. We recognize the land as an act of reconciliation and gratitude to those whose territory we reside on or are visiting."

We are the Association for Media Literacy, and we've always pursued the goal of helping people understand and gain perspective on their invisible media environments. Our definition of media is very broad. It includes technologies and all forms of communication, as you can see in the illustrations on this slide. Many of today's ideas are rooted in the teachings of the late UFT professor and iconic thinker, Marshall McLuhan. He coined the term *the medium is the message* and inspired the founding of AML. His insights continue to enlighten us.

Media literacy joined the English curriculum in 1986. Presently, we are offering the Media Studies Additional Qualification (AQ) courses—the only one in Ontario. We offer Part One, Part Two, and Specialist. We're currently assessing interest in the AQ, and we don't know when we're going to offer it next. If you are interested, please email us, and I will put you on the waitlist. That means you'll receive occasional emails and our newsletter if you subscribe. I promise you this: our AQ will change the way you look at the world. That's a promise.

A couple of key links: [AML.ca](http://AML.ca)—you can go there and find lots of resources, ideas, lessons, blogs, and podcasts. You can subscribe for free and get our monthly newsletter. We never bug you, I promise. Our email address is right there for you. Many of you probably already know it.

This is the great part—oh, I forgot to change the number! I was going to say that you are one of 164, but it just changed today—165, can you believe it? That's the number of people in this room, assuming all of you showed up. Two-thirds of you teach at the senior or intermediate-senior level. The rest are evenly divided among primary and junior levels.

I just want to give a couple of shout-outs: *Rainbow Country*—I hope you're here—you have the most beautiful board website I have ever seen. *Northern Light Secondary School*—two of you are here from Moosonee up in James Bay. *Durham Catholic*—sent 21 teachers, including their superintendent. We've got people from *Yukon* here, and I hope we've got two people from the *UK*. Really, really happy to see that.

## Crowdsourcing Questions and Resources

Today, we are crowdsourcing questions and resources in two shared documents. I'm hoping the URLs are in the chat now. One is a *resource list* that we started, and you can add to. The other is something I call *burning questions about using AI in your practice*—a discussion space. We're going to bring everything that we crowdsource into Part Two in February.

During the webinar, please use the chat for the Q&A session in the last half hour. I want to acknowledge my colleagues on the executive, who are working hard in the background to monitor the chat: *Chelsea Atwell, Michilín Ní Threasaigh, and Sarah Gilpin*. They are working hard for you right now and for all of us.

## Structure of Part One and Part Two

Part One is about critical thinking regarding AI. This group proposed a wide range of questions—over a hundred—so we quickly recognized the need for two webinars.

- **Part One** focuses on *theoretical exploration* of AI.
- **Part Two** will focus on *practical classroom applications* of that theory.

Part One addresses foundational knowledge through two guiding questions, which emerged from participant input:

1. *How might educators address anxieties about generative AI (GenAI) uses in education?*
2. *What might educators need to know about GenAI to foster agency and critical thinking in their classrooms?*

So basically, this is about *what we need to know*. Part Two will be more practical: *what we need to do*.

## Introduction of Moses Velasco

And now, we're going to hear from *Moses Velasco*, who will offer a lively introduction to machine learning. Then, Neil and I will discuss some big ideas around generative AI, and finally, we'll discuss your questions in the last half hour.

Moses has served as a primary, junior, and special education teacher, a school board consultant, and a teacher leader supporting teacher and leadership development. He has been a Director of Learning Programs at the *Ontario Science Centre*, managing school programs, community initiatives, and volunteers. Now, as *Director of Curriculum and Assessment with the Ontario Teachers' Federation*, he oversees educational program development. He is also the co-author of *The Transformative Power of Collaborative Inquiry: Realizing Change in Schools and Classrooms* with Jenny Donoho.

Moses, over to you.

## Introduction to Machine Learning – Moses Velasco

"Thank you so much, Carol. Good afternoon, everyone. I'm delighted that you've been able to join us for this session on machine learning—an introduction to machine learning. I'm just going to start sharing my screen here and making sure that I am good. Carol, can you just confirm for me that you all are seeing my slides?"

"Fantastic. Thank you very much, Carol, for that introduction. What I'm going to spend some time with you this afternoon doing is just going into some background around machine learning—terms like *generative AI*, *artificial intelligence*. Where do all these terms come together, and how do we make sense of this? We want to make sure that everyone is starting from the same place of common understanding."

"This is what you see here on the screen. It's something that a student might type into an AI model. We have lots of different AI products out there right now. Probably the most commonly referenced large language model (LLM) is *ChatGPT*. If a student types this prompt into ChatGPT, they would receive a five-paragraph essay in response. It will actually include quotes from *The Handmaid's Tale* by Margaret Atwood and align them to media headlines. The response is structured as a full essay."

"What's interesting is that many English teachers I know have tried this and said, 'Moses, this is pretty scary because these essays are not that bad.' You would think they'd be rough, but they're not. And what we know is that with each passing month, generative AI—like ChatGPT—is becoming more efficient and producing even better writing. These products are only going to improve."

## Understanding Generative AI

"So, we can think about AI—things like ChatGPT—as something that receives a question or a prompt, processes it, and then produces texts, music, or images. This type of AI is called *generative AI*. The issue, though, is that we don't fully understand what's happening inside generative AI—it's a bit of a *black box*. However, we can unpack it enough to understand how AI gets its data and how it creates responses."

"Artificial intelligence is a discipline—it is a study. It is the ability to create machines or software that imitate intelligent human behavior. When we think about the things we do as humans—like making decisions or recognizing patterns—that's all intelligent human behavior. AI is about making machines or software perform those same cognitive functions."

"Within artificial intelligence, we have a specific field called *machine learning*, which involves training machines or software to improve over time. Instead of a human programmer explicitly coding every rule, the machine learns from data and gets better at tasks without direct human intervention. That's the essence of machine learning."

"Within machine learning, we get even more specific. Researchers have explored *neural networks*, which are designed to mimic how human brains recognize patterns. Neural networks

are a subset of machine learning and form the foundation of generative AI. *Generative AI*—or GenAI—uses neural networks to create new things, like images, text, or music. It learns from existing data it has been trained on and then generates new, similar data."

## Supervised vs. Unsupervised Learning

"There are two main ways AI can be trained: *supervised learning* and *unsupervised learning*."

- *Supervised learning* is when AI is trained on labeled data. The data it receives is labeled with instructions, and it is explicitly told what to do with that data.
- *Unsupervised learning* is when AI is trained on raw, unlabeled data. The AI analyzes patterns, structures, and relationships on its own to make sense of the data.

"I wanted to find a way to understand this better myself, so I used Microsoft's *CoPilot*—another AI tool—to explain supervised and unsupervised learning to a 10-year-old. Here's what it produced:"

- **Supervised learning:** "Think of supervised learning like having a teacher who gives you a lot of examples and tells you exactly what to do. For instance, if you're learning to play a card game, the teacher shows you many cards and tells you which ones are good and which ones are bad. You learn by looking at these examples and understanding the rules."
- **Unsupervised learning:** "It's like having a teacher who gives you a bunch of cards but doesn't tell you anything about them. You have to figure out the rules on your own by looking for patterns. Maybe you notice some cards have similar colors and shapes, and you group them together based on these patterns."

"This analogy helps illustrate how supervised learning is structured, while unsupervised learning allows AI to find patterns without explicit guidance."

## Exploring AI Through Google's "Quick, Draw!"

"I want to show you something that demonstrates how neural networks learn. Back in 2016, Google launched a game called *Quick, Draw!* This game asked users to draw an object in under 20 seconds while AI tried to recognize what they were sketching. The AI had been trained on a dataset of labeled doodles from people worldwide."

"When I played *Quick, Draw!*, I was given a prompt to draw a crayon. As I drew, the AI made real-time guesses: 'I see a line... I see a pencil... I see a crayon!' It recognized my drawing within seconds. However, when I intentionally made a poor drawing, the AI couldn't guess it."

"This game illustrates *supervised learning*—the AI learned from a dataset of labeled images and then compared new doodles against what it had seen before. If my drawing didn't resemble past examples, the AI struggled to recognize it. What's fascinating is that AI doesn't just learn from final images—it also learns from *how* a drawing is made, tracking individual strokes to identify patterns."

"One of the biggest takeaways from this game is *bias in AI training data*. For example, if most of the 'toilet' drawings in the dataset depict Western-style toilets, the AI may not recognize squat toilets common in parts of Asia. This raises important questions: *Who decides what a toilet looks like? Whose perspectives are being included or excluded?* This is a crucial discussion for educators."

## Concerns and Considerations in Generative AI

"There are several concerns and considerations when it comes to generative AI, especially in K-12 education."

- **Unregulated technology** – Generative AI is not yet well-regulated, and there are ongoing concerns about data privacy and oversight.
- **Corporate ownership** – Most generative AI models are owned by large corporations with commercial interests.
- **Opacity of decision-making** – Many people don't fully understand how AI generates content, making it a 'black box' technology.
- **Threats to teaching professionalism** – Some worry that AI could replace traditional teaching roles.
- **Financial accessibility** – The best AI models often require paid subscriptions, raising equity concerns.

"One emerging AI tool for educators is *Magic School AI*, which helps with lesson planning, administrative tasks, and report writing. Before using it, users must acknowledge best practices, including:"

1. **Checking for bias** – AI-generated content can be biased or inaccurate, so it should always be reviewed before sharing.
2. **Applying the 80/20 rule** – AI can handle initial work, but teachers should refine the final 20% to ensure accuracy and relevance.
3. **Using professional judgment** – AI-generated content should be a starting point, not a final product.
4. **Protecting privacy** – Teachers should avoid entering students' personal details into AI systems.

"While these guidelines help mitigate risks, concerns remain—especially regarding corporate ownership and AI ethics."

## Neil Anderson's Discussion: Generative AI and Media Literacy

"Thank you, Moses—great ideas and also fun, and I thank you for that. We're going to make connections to better understand generative AI. This webinar is a response to the disruption presented by generative AI. Disruptions may be uncomfortable, but if we stay calm, they also provide opportunities to re-evaluate and revise our ideas about teaching and learning."

"Generative AI isn't new. Artificial intelligence as a concept is seven decades old, but advances in hardware have significantly empowered it, and media attention has brought it into the public spotlight. It's a trending topic—'sexy,' even. Whether it will fulfill the many apocalyptic predictions remains to be seen. News reports suggest that millions will be profoundly affected, creating anxiety. But this is just one moment in a long technological evolution, much like video and the internet. Teachers will, in time, find ways to use and benefit from generative AI. For now, the best answer might be: *Stay tuned.*"

"If *stay tuned* sounds flippant, consider this: OpenAI began a 12-day string of new product announcements starting today. By the end of those 12 days, our current understanding of generative AI will likely shift. News reports predict that generative AI will transform work, possibly eliminating jobs—including teaching jobs. We don't know whether to worry, celebrate, or simply observe. This uncertainty fuels anxiety."

## **Teachers and the Generative AI Story**

"One of the biggest contributors to anxiety is *identity*. Teachers define themselves through their roles in the classroom. Right now, many educators don't see themselves in the generative AI story, which creates an identity crisis. We feel on the outside of something we don't fully understand. One of the goals of this webinar is to help educators find their place in this evolving story."

"Similarly, students are experiencing an identity shift. They are trying to negotiate their relationship with generative AI, figuring out how it fits into their learning. As teachers, we can guide them—but *only if we first understand it ourselves.*"

## **Media's Role in Shaping AI Perceptions**

"Mainstream media has had a field day with this, particularly in using *alarmist language* to stoke fear. Take CNN, for example. Here are some words they've used: *warn, catastrophic, alarm, extinction-level threat to humans, the U.S. must intervene*. Based on this language, we're all going to die. These reports are morbidly fascinating but also anxiety-inducing. We have to be mindful of this because, just as happened with smartphones, parents and politicians may challenge the use of generative AI in the classroom."

"When others write our story for us, it creates anxiety and undermines our sense of agency. We may feel we don't know enough or haven't done enough. However, anxiety diminishes when we take charge of the story. *Critical thinking fosters agency*. Reading, researching, discussing, and applying knowledge—all these things empower educators and help us regain control."

"Do you remember when *YouTube* first launched? Schools banned it. Teachers were left with limited video resources. Now, it's a go-to educational tool. What changed? *We adapted*. Generative AI will likely follow a similar trajectory—it may be banned in schools at first, but will that stop people from using it? No."

## **Media Environments and the Figure-Ground Concept**

"Each medium creates an *interactive environment* that shapes how we think and act. Social media, for example, has had such a powerful impact that Australia has banned it for users under 16. Instead of bans, the Association for Media Literacy prefers an *educational response*. We need to understand the characteristics of media environments to grasp their effects."

"Marshall McLuhan's *figure-ground* metaphor helps explain why media literacy is essential. We tend to focus on *figure*—what stands out—and ignore *ground*, the surrounding environment. When experiencing media, we are distracted by *content* and fail to see *context*."

"Consider how this applies to AI. Generative AI is an *immersive environment*. We are focused on its output—the figures—but are not critically examining its societal and economic implications—the ground. While we and our learners are using generative AI, we also need to be learning *about* it."

## **AI in Historical and Technological Context**

"To put generative AI into perspective, let's look at historical technological advances. AI is just the latest in a long line of innovations, following the web and smartphones. Benedict Evans, a well-known tech analyst, has said, *AI is eating the world*. Its full implications are still emerging."

"This follows the *S-curve* of technological adoption. Generative AI achieved a \$150 billion valuation within 12 to 18 months—unprecedented growth. However, like all new technologies, it will eventually normalize. Right now, it's in its *exciting, rapid growth* phase, but over time, it will become just another tool."

## **Connections Between AI and Classroom Learning**

"Let's make a few connections to classroom learning. Using generative AI involves *iteration*. Users write a prompt, assess the result, revise the prompt, and repeat the process until they get a satisfactory outcome. This is inquiry-based learning. Writing prompts forces users to think critically about *meaning, codes, and conventions*."

"This iterative process is also present in gaming. When playing an arcade game, we experience failure before achieving success. Similarly, learning through generative AI involves repeated attempts and refinements."

"At its core, *inquiry* is a fundamental human learning strategy. It involves experience, hypothesizing, testing, and retesting—just like generative AI. This makes generative AI a natural fit for *inquiry-based pedagogy* in the classroom."

## **Classroom Applications: AI-Generated Images and Critical Inquiry**

"I want to share an experience I had with generative AI. I asked ChatGPT to create an image of *collaborative learning about AI in a classroom*. The result? Something entirely unexpected. The students were seated in a wooden-floored library, staring at a futuristic, glowing AI figure. It looked more like a *religious* experience than a collaborative classroom."

"So I refined my prompt, requesting a *less traditional* learning environment. The next image was better—it showed students working together, but AI was still depicted in a *robotic, brain-like* manner. If you ask for an AI-generated graphic on this topic, you will likely get either a *robot* or a *brain*. These are dominant cultural symbols of AI."

"This raises an important question: *What does this tell us about our perceptions of AI?* Students can engage in *compare-and-contrast inquiries* using AI-generated images to explore *bias, representation, and accuracy*."

## Summarizing the Generative AI Story

"To summarize: Generative AI is a *disruptive environment*, but this is temporary. Like past technological shifts, it will eventually become normalized. While it represents a *paradigm shift*, we are already familiar with *robotic automation* and *iterative learning*. AI is shaping how we think, create, and teach. Understanding it critically can *turn disruption into opportunity*."

"Ultimately, *we know more than we think we do*. This knowledge fosters *agency*, allowing educators to *finesse this paradigm shift into inquiry-based pedagogy*. And just as we develop our own agency, we can also empower our students to do the same."

## Closing and Q&A

"Thank you for engaging in this conversation. We hope you feel more comfortable with generative AI. We're excited to see the ideas you develop and how you envision you and your students' roles in this evolving story."

"Now, let's move on to the Q&A."

## Q&A Session: Key Questions and Responses

### 1. *How does AI impact literacy and the future of writing instruction?*

- **Neil Anderson:** The question of AI's impact on literacy depends on how we define *literacy*. Writing is just one part of literacy, which also includes reading, creating, and interpreting images, sounds, and media. If we narrow the focus to writing, then the question becomes: *Why should we continue to teach writing when AI can do it for us?*
- **Moses Velasco:** One AI tool writes emails automatically, a feature marketed for business efficiency. This raises the question: *Should we allow AI to write for students?* One approach could be to use AI-generated text as a draft and have students refine it.
- **Carol Arcus:** AI can certainly be useful for drafting and idea generation, but the key is understanding *what happens in between*—the *process* of writing and thinking.
- **Moses Velasco (Example Exercise):** Ask students to prompt AI to write an essay at a 10-year-old's level. Then, using *track changes*, have them refine the AI-generated text to meet a Grade 10 standard. This allows students to develop editing, critical thinking, and writing skills while making their process visible.
- **Neil Anderson:** The process is the product. Whether or not a final version is completed, the most valuable part is the *discussion* and *critical engagement* with the writing process.



## 2. Should educators modify assignments to incorporate AI while ensuring students develop their own skills?

- **Consensus:** AI should be integrated thoughtfully. Assignments should focus on *process, iteration, and metacognition*, rather than simply producing finished work. AI can be used as a tool to support learning, but not replace it.

## 3. What about the ecological impact of AI queries? Is it responsible to 'play' with AI in the classroom?

- **Questioner's Concern:** Every AI query consumes energy and resources (electricity, water). Encouraging students to experiment with AI without considering its environmental impact may not be morally neutral.
- **Neil Anderson:** This raises an important teaching opportunity. Just as we consider the environmental impact of printing or photocopying, we should apply similar critical thinking to AI usage.
- **Suggested Approach:** Limit AI queries to *purposeful exploration* rather than unlimited use. Encourage students to be mindful of their AI engagement, treating it like a *finite resource*.

## 4. Why do AI-generated images often look 'muted' or strange?

- **Carol Arcus & Neil Anderson:** The visual style of AI-generated images is shaped by *existing datasets* and *current limitations of AI models*. AI relies on conventions found in training data, which is why images often appear washed out or unnatural.
- **Prediction:** As AI models evolve, the quality of generated images will improve dramatically, just as AI-generated text has.

## 5. How evident is cultural bias in AI? What should teachers look out for?

- **Neil Anderson:** The best way to identify cultural bias is to *ask those who experience it*. Historically marginalized communities can provide the most insight into AI's biases.
- **Moses Velasco:** AI models reflect the biases present in their training data. If the dataset lacks diverse perspectives, AI-generated outputs will reinforce existing biases. Teachers should critically examine AI-generated content and encourage students to do the same.

## 6. Will AI contribute to a larger problem of misinformation and disinformation?

- **Neil Anderson:** AI is already being used to generate *political propaganda, misleading news, and fabricated images*. This is a major concern, as AI enables the rapid spread of misinformation.
- **Future Outlook:** AI could potentially be used to *detect* misinformation, just as AI currently identifies fraudulent activity or medical conditions. There's a possibility that AI could *counteract* its own misuse.

## 7. Is it ethical or legal to use AI when its training data includes copyrighted content?

- **Neil Anderson:** This is an ongoing legal debate. Organizations like *The Toronto Star* are suing OpenAI over unauthorized use of intellectual property.
- **Possible Solutions:** Teachers and students can choose AI tools that prioritize ethical data sourcing. AI literacy should include discussions about *ethical AI use and consumer responsibility*.

8. *Should students be encouraged to use AI tools, or will they over-rely on them?*

- **Neil Anderson:** Avoiding AI in schools won't prevent students from using it. They spend only *five hours in school* but *eleven hours awake outside of school*. We need to equip them with the skills to use AI *thoughtfully and critically*.
- **Example (Carol Arcus):** Comparing and contrasting AI-generated outputs helps students recognize *bias, representation, and accuracy*. This kind of inquiry-based learning fosters *critical engagement* rather than passive reliance.

9. *How should AI-generated content be cited in academic work?*

- **Consensus:** Both *MLA* and *APA* have developed citation guidelines for AI-generated content. Educators should ensure students *properly attribute* AI-generated work and clarify when AI assistance has been used.
- **Neil Anderson:** AI-generated outputs sometimes include citations themselves. When using AI, acknowledge its role in content creation, much like citing research sources.

10. *How can teachers continue learning about AI and sign up for Part Two of the webinar?*

- **Carol Arcus:** Educators can email *AML* to express interest. The tentative date for Part Two is *February 20*, pending confirmation from guest speaker *Heidi Sewak*. Those who attended Part One will receive follow-up emails with registration details.

## **Final Thoughts from the Panelists**

- **Neil Anderson:** "This has been a fun and stimulating conversation. I'm looking forward to reading through the chat."
- **Moses Velasco:** "This discussion shows how much AI is shaping our thinking. The more we engage with it critically, the better we can guide our students."
- **Carol Arcus:** "We hope these conversations have helped you feel more comfortable with generative AI. I'm excited to see how you and your students explore this space."
- **Chelsea (Moderator):** "Thank you to our panelists and attendees. We had an active discussion today, and I look forward to seeing you all at Part Two!"