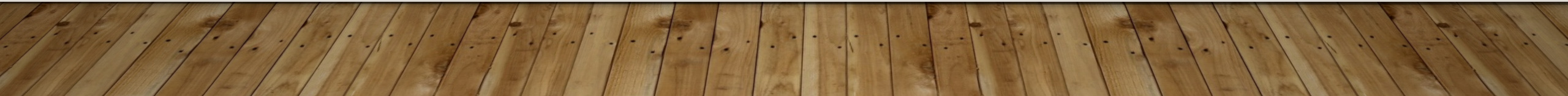


# CHATGPT, AI AND THE FUTURE OF TEACHING AND LEARNING: *We all need a digital assistant!*

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***Stephen Murgatroyd, PhD***

Chief Innovation Officer, Contact North | Contact Nord



# THIS PRESENTATION

- Help you understand what AI is and is not (yet)
- Suggest specific ways in which AI could support teaching and learning – both for you as an instructor and for the college | university | Institute
- Suggest some assessment challenges and approaches
- Flag some limitation and issues
- Point to where AI and related technologies are going



# ABOUT ME

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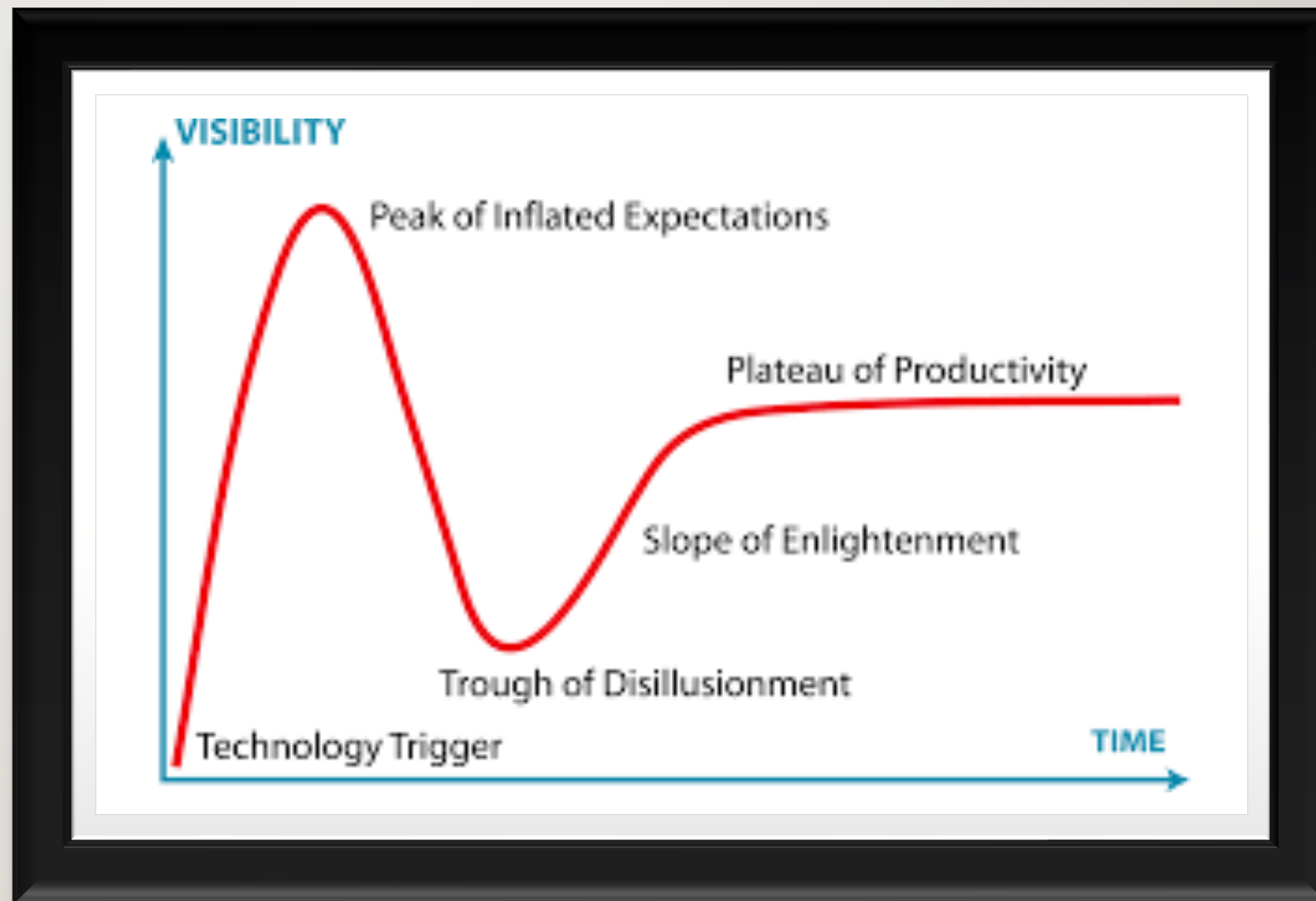
- Been teaching and working since 1972
- Former Dean of Business @ Athabasca University, Vice President of a university in Dubai and CEO of a UK strategic consulting company.
- Teaching at AU and the University of Alberta – anticipatory studies.
- Been working with CN|CN since 2005 as an advisor and Chief Innovation Officer.
- Key Task: **Think back from the future**

# AI AND THE FUTURE OF WORK

- Projections made in 2013 suggested that 47% of all jobs could be directly impacted by AI
- Now becoming clear that AI will displace some work but create more work than it displaces
- No trade, profession or occupation is “immune” to having to “dance with robots” – engage with AI. Already impacting the work of lawyers, accountants, sales, scientific research, architecture, medical diagnostics...
- The more inter-personal skills that are required to be successful at work, the less impact AI will have.

# BEWARE OF HYPE!

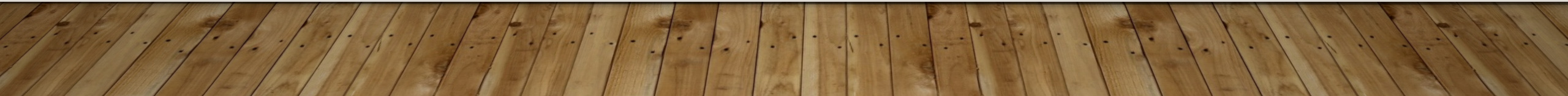
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# WHAT IS AI

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# AI IS NOT

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- **New** – first significant work in the 1970s
- **Expensive** – it used to be, but now many powerful applications are available for relatively small amounts of \$
- **Necessarily reliable** – more later
- **Not yet widely used in education** – but is in other fields like law, health, accounting, and architecture.
- **Yet seamless** – you need to plug a lot of bits and pieces together to make for an efficient work-flow for the kinds of work we do in colleges, universities and polytechnics



RIGHT NOW,  
IT LOOKS A  
BIT LIKE THIS

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BUT QUITE  
SOON IT WILL  
LOOK MORE  
LIKE THIS

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# DIFFERENT KINDS OF AI

- **Narrow AI:** Also known as Weak AI, narrow AI refers to AI systems that are designed for specific tasks and have a limited scope of functionality. **Alexa | Siri**
- **Machine Learning:** A subset of AI that focuses on developing algorithms that can learn and improve from data without being explicitly programmed. **Learning Analytics**
- **Natural Language Processing (NLP):** NLP focuses on enabling computers to understand, interpret, and generate human language. It involves tasks such as text classification, sentiment analysis, language translation, and chatbot development. NLP techniques use AI algorithms to process and analyze text and speech data. **Text to Speech | Speech to Text | Deep Fakes**
- **Virtual Agents:** Virtual agents, also known as chatbots or virtual assistants, are AI-based programs designed to interact with humans through text or voice-based conversations. **24 x 7 Tutors.**

# FIVE BIG GENERAL ISSUES WITH AI

- **Access and affordability** – not everyone has affordable access to broadband or technology and can afford the 6-7 apps (each at \$25/month) needed at this time.
- **Bias and Discrimination** – bias inherent in our systems are perpetuated in AI systems.
- **Reliability** – not everything AI produces is reliable, true or helpful - risk of hallucination
- **Surveillance & Privacy** – concerns that constant monitoring, analysis and biometrics are intrusive – legal action against ProctorU and OpenAI (in the EU)
- **Dancing with Robots and the Future of Work** – will AI replace us at work?

# THE DEVELOPMENT OF Chat-GPT

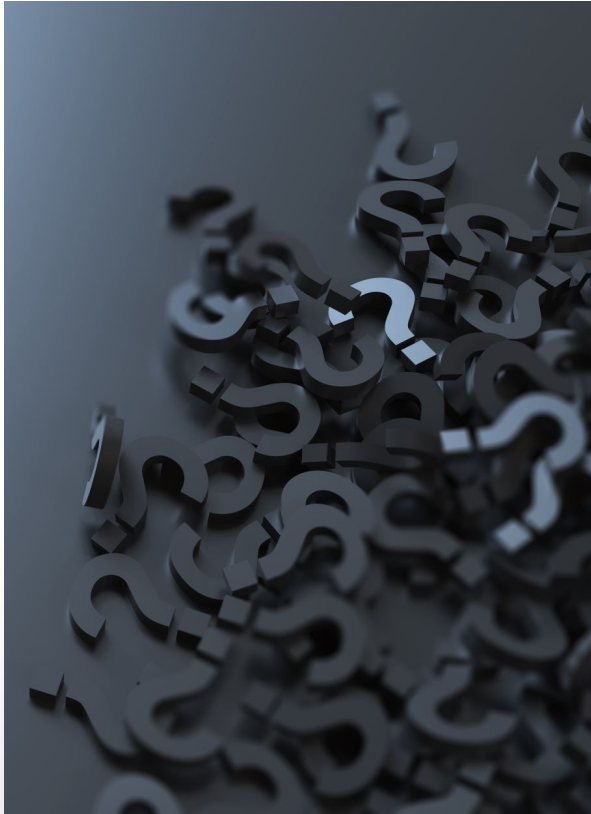
| VERSION      | RELEASE | PARAMETERS                 |
|--------------|---------|----------------------------|
| CHATGPT 1.0  | 2018    | 117 million                |
| CHATGPT 2.0  | 2019    | 1.5 billion                |
| CHATGPT 3.0  | 2020    | 175 billion                |
| CHATGPT 3.5  | 2022    | 400 billion                |
| CHATGPT 4.0* | 2023    | 1 Trillion + Live Internet |

\* Used by Microsoft's BING search engine and available to subscribers to Chat-GPT

# SOME SPECIFIC ISSUES WITH ChatGPT 3.5

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- **Hallucination** – ChatGPT writes 500 words which read as convincing but are not correct. ***Critical review is essential.***
- **Dead wrong** – many references and resources it suggests do not exist or contain errors. ***Fact-checking is required.***
- **Bias** – built into how ChatGPT was trained. ***Checking for alternative views required. Bias sensors up!***
- **Limited** – ChatGPT 3.5 was trained on material up to and including September 2021. ***Check for updates.***
- **Scope:** It could be better for subjects with less than 10,000 online resources. ***Understand limitations.***



# EXAMS ChatGPT HAS PASSED...

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New York Bar Exam as well as Law Exams in four US States



SATs with a score of 1,600 (average human score 1,060)



GRA and AP Exams in a range of subjects



Wharton MBA



Stanford Medical Exam – Clinical Reasoning



Sommelier Examinations (Advanced)



# AI AND THE WORK OF TEACHING, LEARNING & ASSESSMENT

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THE IDEA OF THE DIGITAL ASSISTANT



# WHAT AI IS ENABLING

- **Able to perform task and activities previously in the domain of humans** – e.g., video interviewing, effective psychotherapy, medical diagnostics.
- **Acts as an agent relentlessly pursuing a goal** – ask for detailed information about the history of the fountain pen (including key dates, inventors and manufacturers) and watch!
- **Not replacing people (with some exceptions) but augmented what humans do** – a true assistant, available 24x7 with access to major bodies of knowledge in many languages.
- **A constantly learning engine** – moving from small data-sets to live internet searches (GPT4) – which can learn from its interactions with users and update itself.



## SOME BIG IDEAS TO KICK OFF WITH..

- Design adaptive learning that is "asset-oriented," building on student competencies, rather than "deficit-based" or lack-focused;
- Include social and other aspects of learning in addition to individual cognition-based learning – e.g. Pecha-Kucha Presentations, video-interviews, competency-based assessment using audio, video and evidence of performance;
- Include multiple learning strategies for neurodiverse learners and those with disabilities;
- Leverage the multi-lingual capabilities of AI systems to support learners from a variety of cultural backgrounds.
- Design models that include "active, open, and creative tasks" and innovative approaches in addition to fixed tasks;
- Expand beyond only "correct" or "incorrect" answers to teach students how to keep working on problems and ask for help when needed.



# LET'S FOCUS AND GET SPECIFIC

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SEVEN USES OF AI FOR TEACHING AND LEARNING

# LESSON PLANNING

- Use ChatGPT to create a lesson plan for a course you will teach
- **Example Prompt:** “I am teaching an undergraduate 300-level course in abnormal psychology based on DSM5-TR. I will have 200 students and have 12 sessions, each of 2 hours with these students. Suggest a lesson plan (with timings and suggested videos) for each of these lessons.”
- Then ask it to suggest self-assessment activities the student could use to test their knowledge and understanding.
- Then ask it to develop a final essay + varied question exam.
- [Here's what happens!](#)

# SUPPORT ENGAGED RESEARCH

Use [research rabbit](#) to gather, focus and store research resources.

# ANALYSE DATA FASTER, SMARTER WITH AI TOOLS

- Use AI to analyze data in EXCEL faster without having to master formulae:
  - Use Neuralformula (\$1.99/month)
  - Even smarter – [Defog.ai](#) – ask questions in natural language and defog will find an answer from the data set you provide.
  - Create visualizations from your data quickly using [Coefficient](#)

# PROVIDE PROMPTS TO KICK-START USING ChatGPT PURPOSEFULLY

- In my course focused on productivity, competitiveness and innovation in Canada (more accurately, the paucity of..) I provided specific prompts for a student group assignment.
  - Undertake a Porter five force analysis of industry X
  - Provide a hype curve analysis for the emerging technologies being championed as “transformational” for industry X
  - Provide international comparisons between Canada’s X industry and this same industry across the G20.
- Then I asked them to offer a critique of the ChatGPT responses and to show what their own research did to improve the analysis.
- For the upcoming graduate course *AI and the Future of Teaching and Learning* we have different prompt guide.

## DEVELOP LEARNING QUIZZES, SELF- ASSESSMENTS & FLASH CARDS

- Ask students to create a self-assessment on a key topic (e.g., the twenty key messages in Kierkegaard's *The Concept of Anxiety*) and improve their score over time. Do the same for all set readings.
- Ask students to create a multiple-choice evaluation of their knowledge of non-parametric statistics, do it and share the quiz and their scores with peers.
- Ask students to create an interactive discussion about a specific topic – e.g., the origins and causes of the 100 Years war.
- Ask students to produce flash cards on topics about which they feel uncertain or “weak”.



# CREATING INSTANT POWERPOINT PRESENTATIONS

- Use [beautiful.ai](#) to create instant presentations – tell it the topic (e.g., *The Demographic Challenges Canada Faces to 2050*), and it will produce a slide deck in seconds. Edit.
- Use the design features built into PowerPoint to create better presentations visually.
- PowerPoint add on's can leverage AI to create animations, text to speech etc. – e.g. [Ghostwriter](#)

# SUMMARIZE YOUTUBE VIDEOS

- Use [YouTube Summarized](#) add in to Chrome to summarize a video on YouTube
- Use the summary to create quizzes and challenges for students when you ask them to watch a video with purpose.

# CREATE AN INTERACTIVE CHATBOT FOCUSED ON YOUR COURSES

- Chatbots can be trained to focus on a specific domain of content quickly and efficiently – used to take a long time, now quite fast.
- An early example of a chatbot in higher education [was Jill Watson](#) (using IBM Watson) at Georgia Tech.
- Athabasca University's psychology professors used a chatbot called [Freudbot](#) to engage students in conversations about theories in psychology.
- At Toronto Metropolitan University, Prof. Sean Wise has launched Prof Bot for his students focused on entrepreneurship.
- New tools make this easier – like [OpenChat](#) or [MagicAI](#)

# CREATE AN ACTIVE SIMULATION

- Athabasca University's Faculty of Business has created real-time AI-enabled simulations. Students work on a challenge and chat with real people (instructors) and with avatars. The work reveals biases, understanding of key principles (e.g., "culture beats strategy for breakfast") and soft skills.
- Simulation built by [Ametros Learning](#) in Toronto, partnering with colleagues at AU. Ametros also has "[ready-to-use](#)" modules in a variety of domains.

# IMPROVE STUDENT WRITING

- I asked some students whose writing was “poor” to submit some of it to ChatGPT with an instruction to improve the writing and to explain what changes were made and why. (This can also be done with Grammarly, which is now AI-enabled, or Hemmingway). I then asked them to resubmit their whole assignment with an appendix showing what ChatGPT had suggested.

# SPEECH TO TEXT

- **Zoom | Teams** produces a transcript within a few minutes of a Zoom call ending.
- **Word and Google Docs** can produce text from dictation – speak and text appears.
- **Otter** a dedicated app for speech to text (one of about 25 worth looking at) – integrates with a lot of other software..
- Powerful resource for students with hearing difficulties, those who are newcomers who need to read and hear what you say.
- [Transcribethis](#) strongly recommended.

# TEXT TO SPEECH

- Write text and use AI and available avatars and voices to create audio, video or social media presentations.
- Write in English or French, translate automatically, and use a voice to speak your words. Present in Tagalog (Philippines), Welsh or German or....
- Lots of available products products
  - [Amazon Polly](#)
  - [IBM Watson](#)
  - [Naturalreaders](#)

# AUTOMATIC TRANSLATION

- There are many instant translation AI systems.
  - **Google Translate** – 133 languages with varied accuracy (54% to 94%) – input can be text or spoken voice.
  - **ChatGPT** – 50 languages – better at converting to English than from English but varied. Only inputs and outputs text. (French and German 92% accurate).
  - **SSK Live** – 88 languages (2-way voice, instant) – requires internet connectivity.
- Find articles | research written in a language other than those you speak, translate it into English | French



# AUTOMATIC SUMMARIES OF PDF DOCUMENTS

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- Load a PDF into [Genei.io](https://www.genei.io) press “summary” and hey-presto!
- You can load batches of 10 PDFs at a time and collect them under project headings (e.g., College A, University B, etc.) and look at summaries of each document and cut and paste the results to create a master resources.
- 20 Annual Reports – 30 minutes.



# VIDEO INTERVIEWS & ASSESSMENT

- Students called for an interview (for a job, admission to a graduate program, apprenticeship..) may want help in practicing.
- AI systems are available
  - MyInterview: AI-Powered Video Interview Software
  - **HireVue**: AI-Powered On-Demand Video Interviews for Enterprise
- The algorithms analyze candidates' responses to determine personality traits. **MyInterview** also compiles scores indicating how closely a candidate matches the characteristics identified by hiring managers as ideal for the position.
- Colleague used it in his counselling psychology course.



# ABOUT ASSESSMENT

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YES, WE WILL TALK ABOUT ACADEMIC MISCONDUCT & PLAGIARISM

## LET'S ASK: WHAT ARE WE TRYING TO ACHIEVE IN ASSESSING A STUDENT?

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- Assessment at a basic level examines not just what the student has learned (knowledge, skills and capabilities) but also what the student is able to do as a result of that learning (demonstrable competencies).
- We speak of formative assessment (self-assessment) and summative assessment (assessments that count towards credit, a certificate, diploma or degree).
- Most assessments (exams, multiple choice) are a “trade-off” between appropriate assessment, scale, time and money.
- It is easier to create authentic assessments for a class of 15-30 than for a class of 300.



# SHIFT OUR MINDSET FROM HIGH STAKES TESTING TO LEARNER PROGRESS ANALYTICS

- Exams are efficient, cost-effective and at the same time weak ways of assessing student learning, understanding and skill.
- Exams (esp. multiple choice) are biased against certain kinds of learners.
- An alternative is to focus on the progress the student makes in their learning over time using learner progress analytics – assessing whether or not the student is in “the zone of success”
  - Uses frequent formative assessments to understand what the student knows and does not know.
  - Uses analytics to compare each students progress with the known pathways for success.

# MOVE AWAY FROM TESTING TO COMPETENCY ASSESSMENT

- Rather than test what the student knows through exams, use competency assessments – provide opportunities for students to demonstrate what they know, what they can do with what they know.
  - Assessment on demand (not at a fixed time)
  - Evidence can be varied – video, audio, infographics, testimonials, text
  - Evidence is organized by competency and, if assessed as meeting expectations, moves into the students MyCred™ e-portfolio.
  - Not an all or nothing exam – progressive assessment over time.
  - Assessors can be anywhere in the world – e.g. some academic assessment, some from business|industry, some from peers

# USE AI TO ENABLE AUTHENTIC ASSESSMENT

- Competency-Based Assessment on Demand
  - [Valid-8](#) uses competency statements as then “hooks” for students to submit appropriate evidence anytime | anywhere using video, audio, text, infographics or other formats.
  - Submissions are assessed by trained assessors, and their assessments are reviewed by validators
  - AI can also be used to assess some skills and competencies or to provide simultaneous translation
- Simulations and Immersive Experiences (AI AR/VR) as Indicators of Knowledge Use
  - In various programs – engineering, health, nursing, veterinary, aircraft maintenance, pilot training, and aircrew training – immersive simulators are used to provide an opportunity to demonstrate knowledge in action.

# PEER-TO-PEER ASSESSMENT

- [Kritik.io](#) is a dedicated peer review platform which uses AI-enabled technologies to:
  - Support engaged learning and peer review | assessment
  - Reinforces key constructs and skills presented in the course
  - Strengthens soft and inter-personal skills
  - Deepens critical thinking
  - Reduces instructor time devoted to marking and grading



# USE AI TO GENERATE ASSESSMENTS

- ChatGPT will generate any kind of assessment on any topic in any format.
- You can also use other AI software to do this:
  - Automated item generation –use a past exam to create 500,000 different versions and enable assessment on demand.
  - Automated grading of multiple choice, short and long-form essays, statistical analysis, etc.
  - Software like [OpExams](#) and the opensource [TAO](#) or the STEM focused options in [Brightspace](#).
  - Use [Gradescope](#) from Turnitin to create and grade assessments and track learning progress.



## USE VIDEO PRESENTATIONS

- Students present on video (5 –15 minutes) and AI analysis tools assess both content and their presentation (soft) skills.
- Peer assessments can also be used, provided good rubrics are in place.
- Smart students would use ChatGPT to help them create the script and suggest images appropriate for the video.

# ACADEMIC CONCERNS: PLAGIARISM

- Plagiarism is the “sin” of not acknowledging source material used in an assignment, publication or document.
- APA 7<sup>th</sup> Edition (May 2023) suggests appropriate ways of citing ChatGPT
- But the real issue isn't citation, it is **diligence and integrity**:
  - Did the student do the work?
  - Does the student understand and “own” their work?
  - Will the student integrate the knowledge, skill and capability into their learning?

# YOU CAN ALWAYS CHECK....

- [ZeroGPT](#) is a free-to-use checker.
- [Turnitin says it can now detect AI generated text](#) with 98% confidence.
- So you can check to see if students have used AI text generation and have not cited it.
- Consider what action to take with those students who **do not use** ChatGPT 4! (They need to understand its capabilities and limitations – they will live with it for the rest of their lives!)

# A BETTER STRATEGY

- Rethink assessment from a starting point of purpose: what is it that the student would most benefit from in terms of assessment?
- Significantly increase formative assessment
- Adopt adaptive assessment practices
- Design more authentic assessments
- Use peer to peer assessment more often



# AT THE INSTITUTIONAL LEVEL

AI AS PART OF A SUPPORT SYSTEM

# OFFERING 24X7 ADVICE AND SUPPORT VIA A CHATBOT

- Chatbots are getting easier to program and support (especially with a catalogue of FAQs). Also getting cheaper.
- **Georgia Southern University** trained and deployed their GeckoEngage chatbot in just one week and resolved 96% of inquiries in the first 30 days.
- **Bolton College (UK)** in partnership with JISC developed ADA (chatbot) now used by several colleges across the UK.

# PROVIDING COURSE CHOICE ADVICE LINKED TO CAREER | WORK AMBITIONS- PATHWAY ADVISING

- 58,000+ learning options in GTA 20,000+ in a city like Sudbury.
- Making sense of the myriad of opportunities getting more difficult.
- AI can help build learning and career pathways by aligning requirements against recognized learning options.
- Governments and organizations in [Australia](#), the [United States](#), the [United Kingdom](#) and the [European Union](#) have created datasets using SFIA skills to define desired job profiles. Drawing on these datasets, a course planning tool was developed. We could do that in Ontario.



# USING ANALYTICS TO IDENTIFY STUDENTS NEEDING SUPPORT

- Rio Salado College (Arizona), the Open Polytechnic NZ (OPNZ) and others use analytics to improve retention (persistence), completion (graduation) and return on investment (revenues).
- Civitas Learning is a vendor whose clients report:
  - 11% gains in persistence
  - 34% gains in graduation rates
  - An average annual gain in ROI of \$1.5 million
- OPNZ also uses analytics to identify underperforming courses which need revision or radical change to improve outcomes

# OFFERING 24X7 MENTAL HEALTH SUPPORT

- Using a clinically proven AI-enabled therapeutic service – e.g., [Velibra](#) – to support students experiencing stress, anxiety or depression.
- A RCT evaluation study by the UK's National Institute for Clinical Excellence (NICE) showed that Velibra used without therapist guidance alongside usual care was more effective than usual care alone in people with social anxiety disorders.



WHAT'S NEXT?

# MICROSOFT'S COPILOT AND BING!

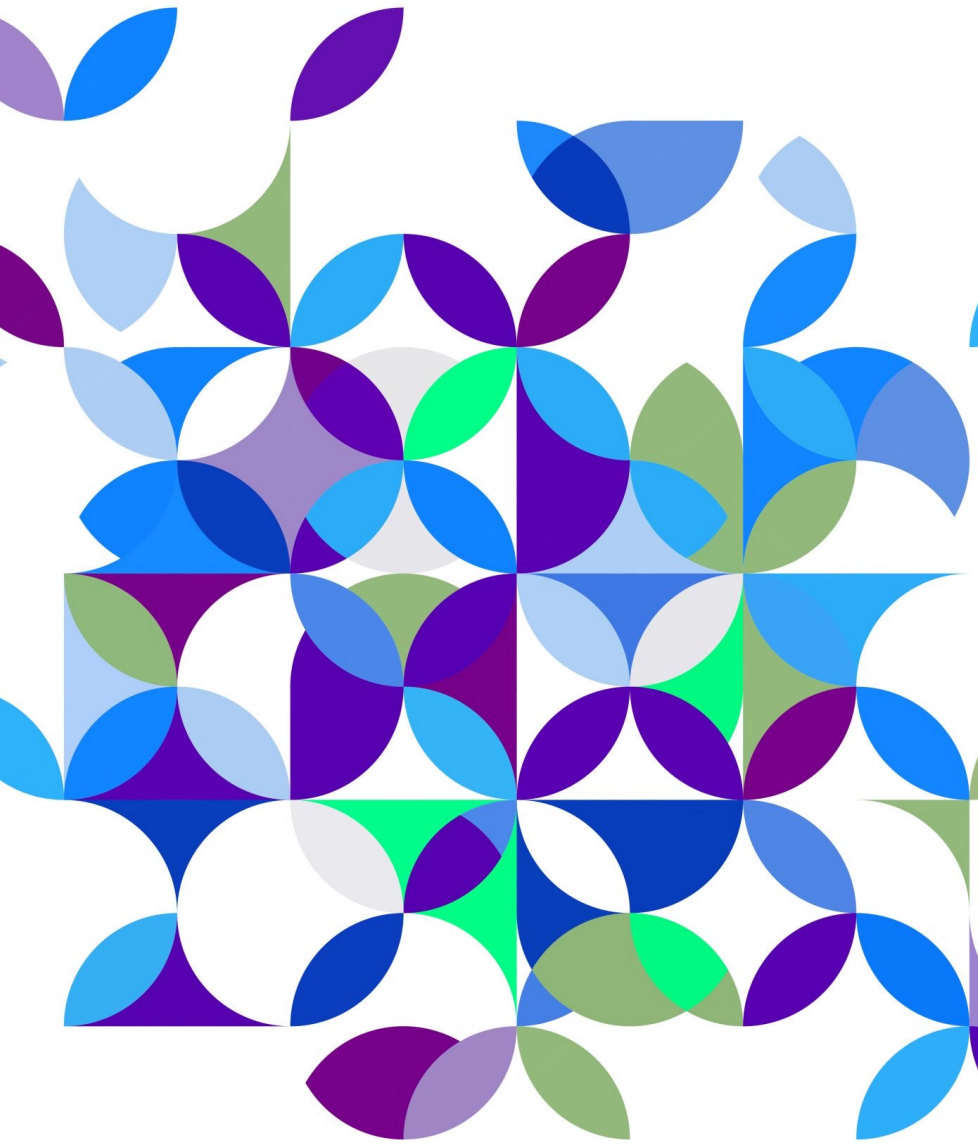
- **BING** uses ChatGPT 4.0 to support your explorations and work – free to use.
- Microsoft will incorporate **Copilot** into all MS Office 360 products so that you can:
  - Generate automated PowerPoint presentations and enhanced images (DALL-E)
  - Create documents generated by AI within Word and | or edit using grammar, sense assessment and plagiarism checkers.
  - Quickly analyze Excel spreadsheets without having to develop complex formulae
  - Automate the use of OneNote to gather needed resources (web sites, clips, etc.).

# SUPPORTING STUDENT SUCCESS

- Contact North | Contact Nord has an AI app:
  - [An app which supports students in their learning](#)
- We can expect that many more **Chatbots** will start to appear within the PSE system offering advice and assistance to learners struggling with technology, course choices, and career questions.
  - TMU's [Prof Sean Wise launched ProfBot](#) for his courses in entrepreneurship.
  - [PAL \(Personal Assistant Line\) at St. Lawrence College](#) helps students through the admissions and “start-up” process.
  - More to come...

# AUTOMATED COURSE CREATION

- Software is emerging that will create learning modules based on a small number of prompts or a set of notes.
- For example:
  - <https://minicoursegenerator.com/> is designed for micro-learning
  - <https://www.coursebox.ai/> - courses created in under an hour
  - <https://www.skillshare.com/>
  - <https://www.learndash.com/pricing-and-purchase/>



# MY ADVICE TO YOU

# THREE THINGS

- **Experiment** – spend time exploring opportunities.
- **Share** – across your peer network what you have found to work and what doesn't work.
- **Keep Up** – AI developments are moving VERY FAST – subscribe to [Ben's Bites](#) to stay ahead (free). Also [TheresanAlforThat](#) is good fun.



**BE WELL.  
HAVE FUN.  
BE SUCCESSFUL!**

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