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***FIRST  
CONSIDERATIONS IN  
RESPONDING TO AI  
IN HIGHER  
EDUCATION***

[Sources](#)

The purpose of this module is to guide educators and teachers through the topics and questions that are prerequisite to making decisions about AI in higher education.

By the end of this module, teachers and educators should be in a better position to begin making decisions about competencies, assessment, curricula, and policies.

## Questions to Consider Throughout this Module

1. *What sorts of activity and meaning does my discipline include besides computation or manipulation of data?*
2. *What kinds of attitudes and abilities (linguistic, communicational, creative, affective, critical, etc.) are essential to my discipline?*
3. *How does my discipline contribute to broader human flourishing and what role do human beings play in this added value?*  
*(E.g., Why might we generally care about understanding math ourselves rather than letting machines do math for us?)*
4. *If students used AI to do their work, how would this affect their general development and the cognitive/affective/creative work that might normally be involved in my discipline?*
5. *If AI became regularly used in my discipline, how might that change the social, political, and economic environment in which work in my discipline is carried out?*  
*(Would interpersonal interaction become less common in my field? Would the kinds of knowledge that students need to succeed change? Would the social, economic, or political significance of the discipline change?)*

*It can be difficult to respond to generative AI without at least a basic understanding of how it works and what it is capable of.*

I. HOW DOES  
GENERATIVE AI  
WORK? HOW HAS  
IT DEVELOPED  
SINCE 2022?

## Generative AI is *not*:

- a magic oracle, a genie, or otherwise mysterious source of knowledge;
- an entity with subjecthood, desires, aspirations, feelings, or any kind of personal identity;
- literally able to ‘speak’, ‘think’, ‘believe’, ‘affirm’, etc.
- actually ‘*intelligent*’ in the common sense of the word.



## **Generative AI is:**

*A very complex algorithm (or series of algorithms)...*

*used to transform existing digital data into new data...*

*that is interpreted by human users as information...*

*which they are statistically likely to appreciate or find coherent.*

# How do LLMs (Large Language Models) work?

## 1. Tokens

To begin with, LLMs process data (which we interpret as language) by way of “tokens.”

Just as language can be represented in binary code, in hieroglyphics, emojis, etc., LLMs reduce natural language to a series of numerical identifiers or “tokens,” where each token generally represents some letters or characters.

(ChatGPT 4 uses 100,277 such symbols or tokens. See Andrej Karpathy, “[Deep Dive Into LLMs.](#)”)



[Rosetta Stone, British Museum.](#)

## 2. Pre-Training

An LLM is ‘trained’ on massive amounts of data. It analyzes text (represented as tokens) and establishes the regularity or probability with which certain tokens are associated with others.

(Hence the term *GPT*, *generative pre-trained transformer*.)

## 3. Parameters

Parameters refer to the “weight” or “bias” with which different tokens or pieces of data are associated with one another, or their statistical likelihood of appearing together. *These parameters are expressed through complex mathematical equations.*

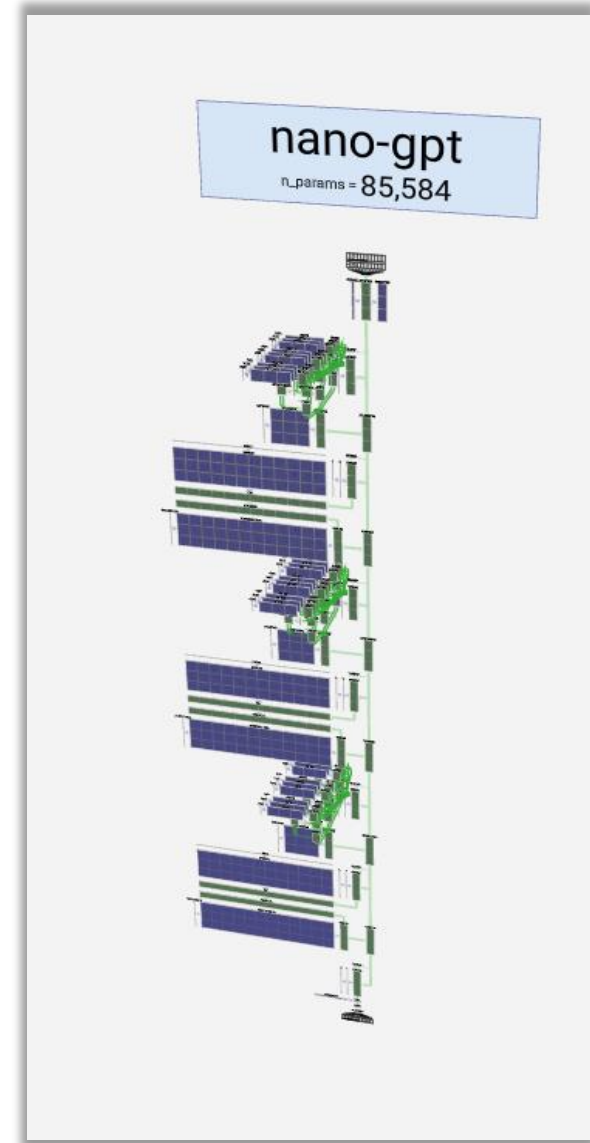
These parameters define how the GPT will process input and return new output.

*Current GPTs use around 100,000 tokens and some hundreds of billions or a trillion parameters.*

## 4. Neural Networks

Neural networks refer to *the series of parameters and mathematical functions through which a GPT processes input.*

*The term comes from the way that “artificial intelligence” mimics the meaningful associations that allows the human brain to function and process data through thought.*



[LLM Visualization.](#)

## 5. Post-Training

Human beings, often with various kinds of expert knowledge, are hired to develop “model conversations” (according to strict guidelines established by the development companies), which are then encoded as new sequences of tokens.

These become special references within the algorithm that structure the GPT’s neural network and ensure that responses come out in the way that users might want or expect.

*Post-training conversations might include questions and answers about mathematical equations, travel tips for Paris, translations between one language and another, etc.*

*While this work was originally done by human beings, LLMs themselves are increasingly being used to do this post-training under human supervision.*

## Why should teachers know (more or less) how LLMs work?

It is important that we:

- **Acknowledge that LLMs can be extremely useful** and interesting in science, art, economics, politics, and in many other fields of work, but...
- Acknowledge that computers and **LLMs only process data** in mathematically sophisticated ways.
- Think about the **implications of attributing great importance to data processing.**

## How Has Generative AI Developed since 2022?

- LLMs now scan internet databases or documents uploaded by users.
- LLMs have fewer “hallucinations” and are in some sense more “reliable.”
- LLMs have a significantly improved ability to treat numerical problems.
- It has become difficult in many cases to **tell the difference between real and generated photo, video, audio content.**

## How do newer LLMs have fewer hallucinations?

Earlier models were post-trained with model conversations that always showed the GPT responding confidently with a definitive answer. Therefore, the GPTs did not have algorithms in place to regularly produce responses such as, “I am not familiar with this topic,” or “Perhaps you meant to ask XYZ...”

Newer models can re-submit a user prompt several times “in the background” and compare multiple answers. If the answers appear significantly different from one another, the model can then arrive at a statistically more acceptable response such as: “I do not have this information.”

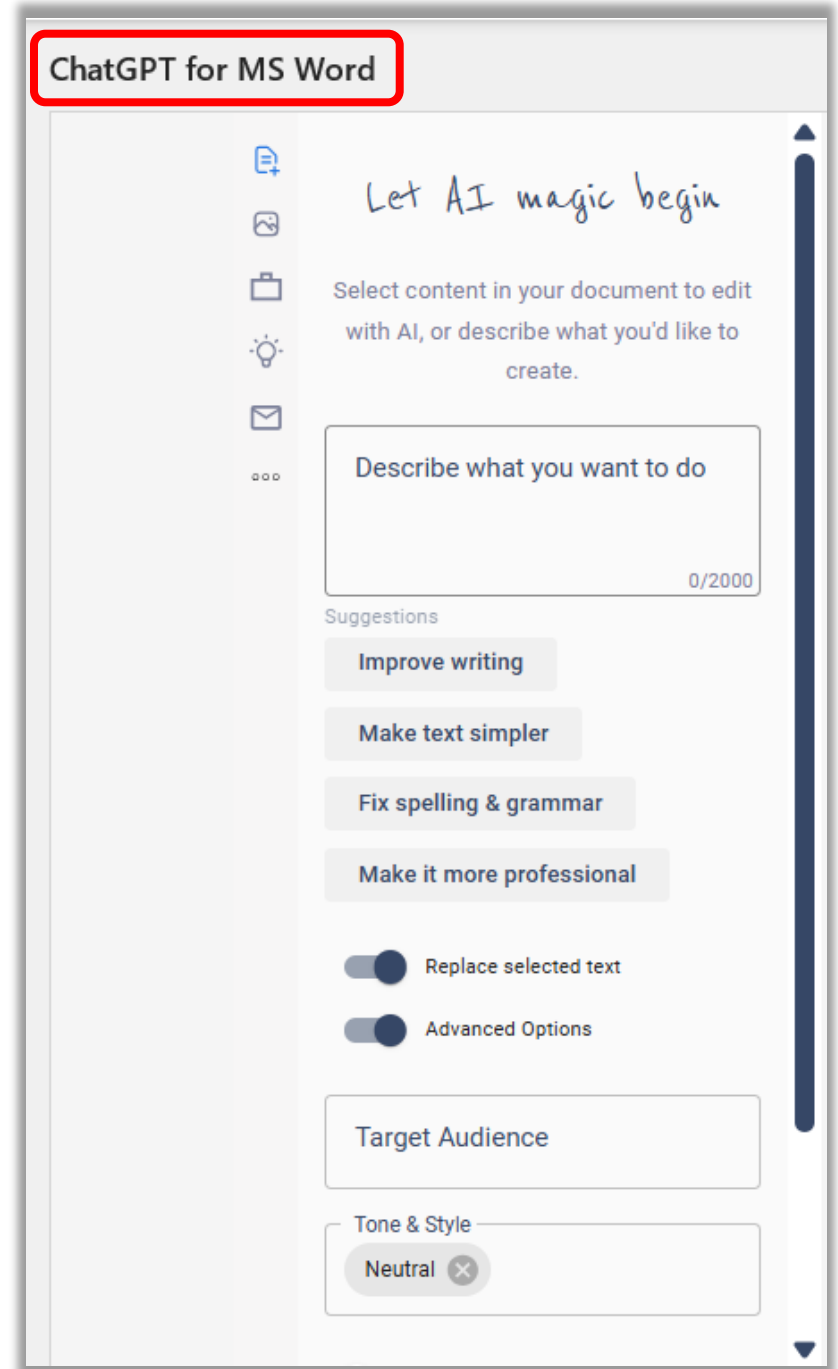
LLMs can also use tokens to prompt themselves to do internet searches to seek information. In such a case, the LLM is not relying purely on pre-training data and parameters, but also on a “context window” of explicit text or data retrieved from, e.g., a Google search. In the case of Copilot and ChatGPT, for example, the LLM will cite internet sources when it does this.

In case you were wondering!

## Integration of Generative AI into more software

It is important to note that generative AI is now integrated into standard web search engines like Google, into PowerPoint and Word, into Adobe software, and in other commonly-used platforms.

*This is important to know before communicating to students what tools they are allowed to use—and in what capacities—for various assignments.*



*Besides the technical functioning of LLMs and generative AI, what should educators be aware of?*

## 2. OTHER PERTINENT POLITICAL, ECOLOGICAL, AND SOCIAL CONSIDERATIONS

# Elon Musk: 1M Nvidia GPUs? Nah, My Supercomputers Need the Power of 50M

Elon Musk mentions the ambitious five-year goal after Sam Altman announced plans to run 'well over 1 million GPUs by the end of this year' and scale up the compute power by 100x.

## 1. Environmental Concerns

Companies like Google, Open AI, and Anthropic have largely kept data related to power usage a secret, perhaps to avoid bad PR or to conceal trade secrets. Generative AI is increasingly used to process massive amounts of information to generate high resolution videos, and in general the energy requirements seem to be quickly increasing.

“But three months later the company [Open AI] launched a larger, higher-quality model that produces five-second videos at 16 frames per second [...]. The new model uses more than 30 times more energy on each 5-second video: about 3.4 million joules, more than 700 times the energy required to generate a high-quality image. This is equivalent to riding 38 miles on an e-bike, or running a microwave for over an hour.”

The Current

## Microsoft, Google and Amazon turn to nuclear energy to fuel the AI boom

Companies investing in small modular reactors that proponents call a safer approach to nuclear energy



[Mehek Mazhar](#) · CBC Radio · Posted: Oct 29, 2024 12:56 PM EDT | Last Updated: October 30, 2024

[“Big tech companies are scrambling to secure nuclear energy deals worth billions of dollars in order to meet the growing demands of generative artificial intelligence \[...\].”](#)

*“Depending on climate change management and its consequences, [AI] may contribute to the demise of a significant portion of humanity. It may also protect and advance the interests of those who benefit from chaos.”*

— Comment collected from an educator in, [“A comprehensive AI policy education framework for university teaching and learning,”](#) Cecilia Ka Yuk Chan.



## ***Google Plans to Roll Out Its A.I. Chatbot to Children Under 13***

The tech giant said it would make its Gemini chatbot available to children next week, and warned families in an email about the changes.

“Educating Kids in the Age of A.I.,” *The Ezra Klein Show*.  
May 13, 2025, with guest education author Rebecca Winthrop.

## **2. The Race to Attract Young Users or Adherents**

[“They are racing to get allegiance of young kids. This is terrible because those products are not designed for children and for learning.”](#)

Microsoft and other massive, global tech companies are trying to attract users and to make them dependent on their tools and services. It is important to remember that these companies are profit-driven.



Sen. Bernie Sanders   
@SenSanders



Robotics and AI are revolutionizing the economy.

Who benefits? Who gets hurt? How do we make the new technologies benefit ALL, not just the few.

That is the major economic issue of our time.

Sections

WSJ



DJIA -0.04% ▼

S&P 500 0.40% ▲

NASDAQ 0.83% ▲

EXCLUSIVE

# Amazon Is on the Cusp of Using More Robots Than Humans in Its Warehouses

The e-commerce giant now counts more than



Bernie Sanders   
@BernieSanders



The CEO of Anthropic (a powerful AI company) predicts that AI could wipe out HALF of entry-level white collar jobs in the next 5 years.

We must demand that increased worker productivity from AI benefits working people, not just wealthy stockholders on Wall St. AI IS A BIG DEAL.

9:12 AM · Jun 5, 2025 · 391.8K Views

 306

 619

 4.5K

 355



### 3. Economic Considerations

As already wealthy tech companies are investing billions in infrastructure while trying to attract young people who will likely become dependent on AI, one might wonder for whose benefit these investments are being made. Even as educators, we should be aware of the political-economic world in which we are complicit through institutional decisions.

Could teaching be one of the jobs that is outsourced to AI?

Governments are often willing to cut spending on education wherever they can. However...

To answer the question whether AI should replace teachers, we could pose a couple of other questions:

- What would you choose for your child?
- Thanks to technology, do your students now seem more independent, mature, and capable than they were in the past?

Many past technologies (radio, television, MOOCs, etc.) were promised to revolutionize teaching and the classrooms in ways that never came to pass.



## 4. The “Digital Divide”

While developed countries and already phenomenally wealthy technology developers race to develop the tools on which all industry and communication will come to depend, many have raised concerns about a “digital divide.”

There is some risk that **only certain countries or members of society will have access to and benefit from AI and developing technologies while others will be left with significant economic and political disadvantages.**

(See Liu, Danny and Bates, Simon, “Generative AI in Higher Education: Current Practices and Ways Forward,” p. 19-20).

## Local Digital Divides

On a smaller, local level, one can already imagine that:

**Students with ample resources** of various kinds (parental support, wealth and free time, technical competencies, etc.) will use AI to:

- (a) augment their capacities and competencies in various ways;
- (b) to complete homework that will get them higher grades (whether merited or not).

While **students with fewer resources** may be using AI:

- (a) as a crutch for lack of preparation and lack of time, undermining the development of their capacities;
- (b) to aid with their schoolwork in ways that leaves them likely to be accused of plagiarism while their classmates' work goes unflagged.

## Further Learning

To the extent possible, **educators must stay informed about technical, practical, and ethical aspects of AI-use for education and in their domain of teaching.**

Customized GPTs are continuously being used for new tasks. Machines are programmed to “train themselves” according to various criteria. The applications and potentially ethical implications are likely to continue to evolve rapidly.

*What has been the practical impact on education?*

### 3. CHEATING, DEVELOPMENT OF COMPETENCIES, AND IMPACTS ON HIGHER EDUCATION

## How many students are cheating and how aware are teachers?

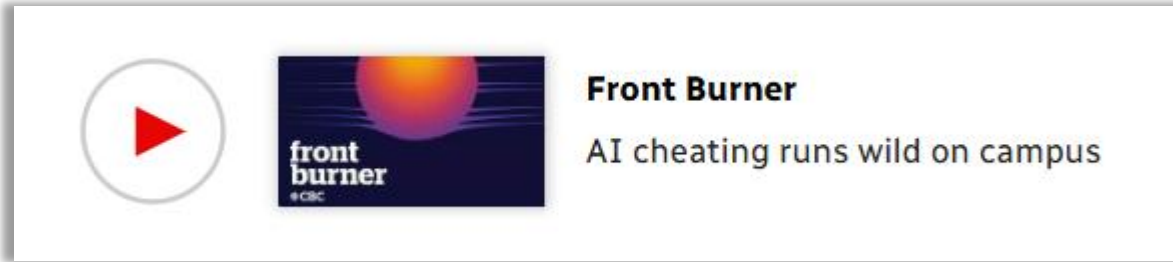
It is difficult to reliably track statistics on cheating. However, some formal and informal research has been done, suggesting that **60% – 90% of higher education students are using generative AI to complete their schoolwork, with 4-5% using it to cheat.**

**'I received a first but it felt tainted and undeserved': inside the university AI cheating crisis**

*The Guardian, December 2024.*

“More than half of students now use generative AI to help with their assessments, according to a survey by the Higher Education Policy Institute, and about 5% of students admit using it to cheat.”

“Many academics seem to believe that ‘you can always tell’ if an assignment was written by an AI, that they can pick up on the stylistic traits associated with these tools. Evidence is mounting to suggest they may be overestimating their ability. Researchers at the University of Reading recently conducted a blind test in which ChatGPT-written answers were submitted through the university’s own examination system: 94% of the AI submissions went undetected and received higher scores than those submitted by the humans.”



May 30, 2025

*While few higher education students globally ( $\approx 4-5\%$ ) admit to using it dishonestly, **many students might have different conceptions than their teachers about what constitutes “legitimate” use of AI.***

“...I spoke to a student at a top university in New York City [...]. [S]he started off our conversation saying, ‘I am totally against cheating’ [...]. But what she did instead of copy and pasting [...] an essay from ChatGPT into a document was she asked ChatGPT to generate an outline and topic sentences for each paragraph of an essay. So, essentially, this chat bot was coming up with the idea, the topic sentences. And she [...] had to do a kind of paint by numbers for her essay [...]. She was very proud of how quickly she can do this [... S]he said she started the assignment the morning it was due, woke up early and spent two hours on it and filed the assignment when normally, it would have taken her, you know, four or five days of writing[...].”

## Data from Champlain

According to a spring 2024 survey of Champlain students (with  $\approx$  327 respondents):

- 69% of students said that they had used AI. (*This number is likely higher now in 2025.*)
- 2.4% of students admitted to using generative AI to cheat.
- 46.9% of students believe that their classmates are mostly using AI dishonestly or to cheat.
- Several students commented that **they were worried that they will not be able to succeed if they do their work honestly** while their classmates cheat without consequences.

## Impacts on Development of Competencies: An MIT Preliminary Study

Some preliminary studies have investigated the neurological, intellectual, and psychological effects of using AI for intellectual work such as writing. **One study by MIT researchers, “[Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Tasks](#)” studied the neural activity and learning of students who used either ChatGPT, Google Search, or only traditional typing software.**

- Students first wrote 3 essays.
- Group 1 was allowed to use ChatGPT;
- Group 2 used Google Search;
- Group 3 used only traditional word processing software.
- In a final round, students who had used ChatGPT to write their previous 3 essays were asked to write an essay using no special tools.
- Students who had written the previous 3 essays without special tools were asked to write one using generative AI.

Essays were graded, and students were interviewed. They were asked about their work, to cite parts from memory, etc.

- *Hinderance of Knowledge Gain, Promotion of “Metacognitive Laziness”*

“When students rely on AI to produce lengthy or complex essays, they may bypass the process of synthesizing information from memory, which can hinder their understanding and retention of the material. For instance, **while ChatGPT significantly improved short-term task performance, such as essay scores, it did not lead to significant differences in knowledge gain or transfer.** This suggests that while AI tools can enhance productivity, they may also promote a form of ‘metacognitive laziness,’ where students offload cognitive and metacognitive responsibilities to the AI, potentially hindering their ability to self-regulate and engage deeply with the learning material” (p. 19).

- Change in the Sort of Cognitive Tasks Being Done Depending on the Available Tools

“Collectively, these findings support the view that external support tools restructure not only task performance but also the underlying cognitive architecture” (p. 136).

I.e., for those using the LLM, ***the task often became to prompt a machine to write an essay, rather than to do some research or to write an essay based on one’s own knowledge and reasoning.***

*(Moreover, different LLM users —“higher-competence” and “lower-competence” learners—used the LLMs very differently, either to aid their work or to have the LLM do the work for them [p. 15-16].)*

- Inability to Quote One's Own Essay

“Correct quoting ability, which goes beyond simple recall to reflect semantic precision, showed the same hierarchical pattern: Brain-only group > Search Engine group > LLM group. The complete absence of correct quoting in the LLM group during Session 1, and persistent impairments in later sessions, suggested that not only was memory encoding shallow, but the semantic content itself may not have been fully internalized” (p. 137).

I.e., students were writing essays without mentally processing the content themselves.

- Increased Risk of Bias and Echo Chambers

“Participants engaged in more biased information querying with LLM-powered conversational search [...]. This occurs because LLMs are in essence ‘next token predictors’ that optimize for most probable outputs, and thus can potentially be more inclined to provide consonant information than traditional information system algorithms. The conversational nature of LLM interactions compounds this effect, as users can engage in multi-turn conversations that progressively narrow their information exposure” (p. 21).

- Decreased Sense of Ownership Over the Work

“While Brain-only group claimed full ownership of their texts almost unanimously (16/18 in Session 1, rising to 17/18 by Session 3), **LLM Group presented a fragmented and conflicted sense of authorship**: some participants claimed full ownership, others explicitly denied it, and many assigned partial credit to themselves (e.g. between 50-90%) [...].

**In the LLM group**, the delegation of content generation to external systems appeared to have disrupted these metacognitive loops, **resulting in a psychological dissociation from the written output**.

The Search Engine group, which relied on the web browser, showed more stable ownership patterns but still less certainty than the Brain-only group. Participants often reported partial authorship (e.g. 70-90%), likely due to the interleaving of internal synthesis with external retrieval [...].

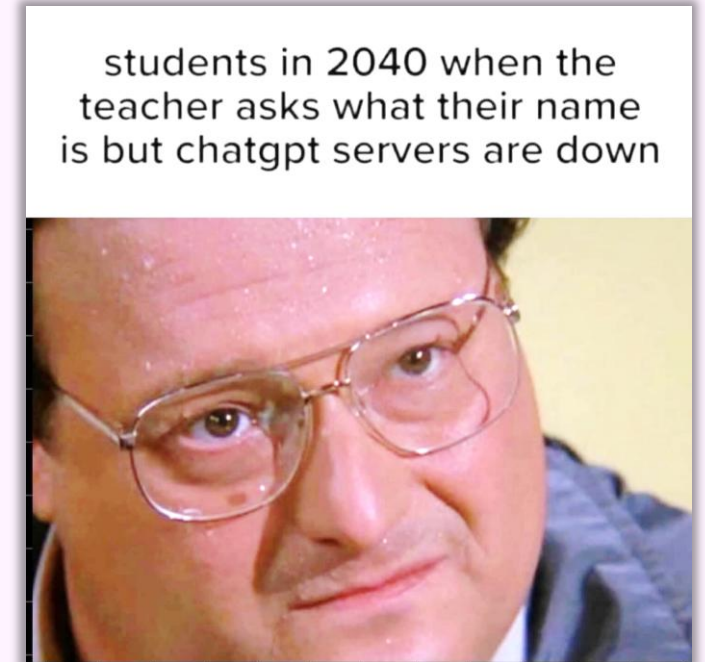
If users rely heavily on AI tools, **they may achieve superficial fluency but fail to internalize the knowledge or feel a sense of ownership over it.**” (p. 138)

- Decreased Development of Cognition and Competencies

“In Session 4, removing AI support significantly impaired the participants from original LLM group: 78 % failed to quote anything [...] and only 11 % were able to produce a correct quote [...]” (p. 140).

**“Only a few participants in the interviews mentioned that they did not follow the ‘thinking’ aspect of the LLMs and [instead] pursued their [own] line of ideation and thinking.**

Regarding ethical considerations, **participants who were in the Brain-only group reported higher satisfaction** and demonstrated higher brain connectivity, compared to other groups. **Essays written with the help of LLM carried a lesser significance or value to the participants [...], as they spent less time on writing, and mostly failed to provide a quote from [their] essays”** (p. 143).



Internet meme, 2025.

## What to Make of New Data on Cheating and the Impacts of AI-Use By Students?

*There is some short-term risk that students will not see post-secondary education as valuable if:*

- *They have the impression that students can only compete by cheating;*
- *They feel no ownership of the AI-aided work that they do;*
- *They feel like they do not leave college with real cognitive and economically valuable skills.*

*There is some risk that students' learning will be negatively impacted if their use of AI is not carefully guided.*

*Educators must:*

- *Think about the competencies they want to teach and how these can be complemented or contradicted by the use of AI;*
- *Structure assignments to encourage and discourage uses of AI as appropriate to the assigned tasks;*
- *Develop a sustained and uniform message to students about academic integrity;*
- *Hold students accountable in cases of academic dishonesty.*

## A few considerations from the foregoing information:

- The availability of generative AI has a deep impact on how people can now choose to complete tasks.
- The same college assignment could lead to students doing very different kinds of cognitive work depending on what tools they use and how.
- Many students want to work honestly but have very different ideas than do their teachers about what constitutes an academically legitimate use of AI.
- Many students worry that they will not be able to compete by doing their work honestly while others cheat without consequences.
- Students (and teachers and institutions) may often have varying ideas about what students' goals should be in college. Such goals might include:
  - To efficiently (i.e., quickly) submit work that will receive good grades;
  - To get their diploma or credentials for later economic benefit;
  - To improve their competencies, critical thinking, and other skills;
  - To develop their knowledge;
  - To make social connections;
  - To mature emotionally, spiritually, or intellectually, to develop healthy attitudes, etc.

*What is the social significance of the changes brought about by AI?*

*“Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral [...]”*

*— Martin Heidegger, “The Question Concerning Technology.”*

*“For any medium has the power of imposing its own assumption on the unwary.”*

*— Marshall McLuhan, “The Medium is the Message.”*

## 4. IMPORTANT SOCIAL AND PHILOSOPHICAL CONSIDERATIONS

This section covers a number of philosophical dimensions of technology and education that are necessary to consider when responding to generative AI in an educational context.

*In the author's opinion, this is the most important content of the present module.*

## The Age of the Infosphere

Many theorists believe that the emergence of information and communications technologies is as significant in human history as the emergence of the printing press or the *written word*.

The appearance of writing dramatically changed people's relationship to information, memory, thought, perception, time, and themselves.

The printing press had impacts of a similar order on the homogeneity of language, the availability of information, and the development of literacy.

**Some theorists believe that we have not properly taken stock of the significance of the changes to human life that have been underway since the mid-twentieth century.**

*With the emergence of AI, educators must be prepared to confront a new paradigm of information generation and processing, new cultural norms of literacy, and new political-economic contexts of learning.*

## The Techno-Social World

Philosopher Luciano Floridi writes: “When the migration [to the digital world] is complete, my guess is that **Generation Z will increasingly feel deprived, excluded, handicapped**, or poor to the point of paralysis and psychological trauma whenever it is disconnected from the infosphere, like fish out of water. One day [... it] will be so natural that **any disruption in our normal flow of information will make us sick**” (*The Fourth Revolution*, p. 98).

It is not that these denizens of the “digital world” will necessarily have incredible competencies related to computing, but they will be dependent on information technologies.

# Speed

For decades, human beings have been asked to keep up with the information generated and transferred via computing and instant global communications. We are bombarded with global news and advertisements; we receive emails and messages at all hours; social media constantly allows us to take in new information about acquaintances and strangers.

Generative AI now produces and analyzes information at speeds far exceeding human capacity.

This raises a number of questions:

- ***What is the psychological and social effect of human beings processing so much data?***
- ***Are our personal resources being spread too thin when we try to keep up with the speed of modern information and communications technologies?***

**“Mental breakdown of varying degrees is the very common result of [social] uprooting and inundation with new information and endless new patterns of information.”**

— Marshall McLuhan (“The Medium is the Message,” p. 16 [1964]).

Byung-Chul Han (b. 1959):

**“Anything time-consuming is on the way out. Truth is time-consuming.** Where bits of information come in quick succession, we have *no time for truth* [...].

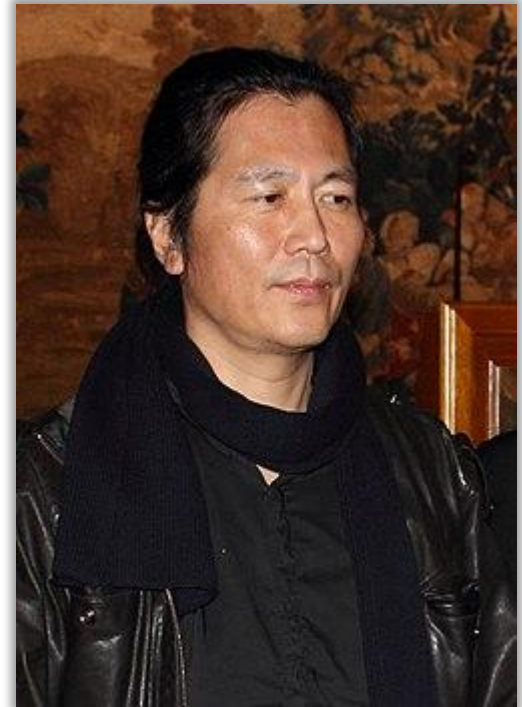
Everything that stabilizes human life is time-consuming. **Faithfulness, bonding and commitment are time-consuming practices** [...].

**Today, we pursue information without gaining knowledge** [...].

**We communicate incessantly without participating in a community.**

**We collect vast quantities of data** without following up on our *recollections* [...].”

(Han, *Non-Things*, p. 6-7).



## A Machine's World?

Since the time of Georg Wilhelm Friedrich Hegel (1770-1831), philosophers and social theorists have been aware **that the character of our activity comes to have an impact not only on the world and on objects, but on ourselves.**

One sees this insight in Martin Heidegger's (1889 – 1976) analyses of technology:

For Heidegger, **while we think that we are using technology to instrumentally harness nature's energy for our own benefit, the same pursuits have allowed a technologically-oriented society to harness "human energy" and leave it ready for utilitarian disposal** ("The Question Concerning Technology," p. 18).

One sees already the way in which using AI to write essays—thus delegating human activity to machines—decreases students' sense of ownership over the work being done.

**By using AI tools, we risk outsourcing activities that hitherto were essential to developing some of the attitudes, knowledge, and skills that we most valued.**

It is easy to imagine how, over time, this could impact our collective sense of identity, sense of purpose, social values, and so on.

One can also see that unreflective and extensive use of AI over time could **lead people to be used as instruments** for some unforeseen purpose.

# Digital “Reality”: Meaning vs Information

“ICTs [*Information and Communications Technologies*] make us think about the world informationally and make the world we experience informational. The result [...] is that ICTs are leading our culture to conceptualize the whole reality and our lives within it in ICT-friendly terms, that is, informationally [...]. **ICTs are modifying the very nature of, and hence what we mean by, *reality*, by transforming it into an infosphere**” (Floridi, p. 40).

***What is the difference between data, information, and meaning?***

As suggested, computers and AI essentially process **data** in a regular way according to algorithms. Data in this case is simply quantitative (and ultimately binary) input.

When data is sufficiently organized, it can become **information**. It can take on a kind of sense and carry some semantic content.

Beyond simply processing information, human beings also perceive and think with the use of **meaning**, where information is not just neutrally indicative of some objective reality, but where things are charged with various kinds of significance. *This meaning derives from lived and historical personal and communal experiences.*

## Example: Data vs Information vs Meaning

Data:

```
01010011 01101110 01101111 01110111 00100000 01101001  
01110011 00100000 01110111 01101000 01101001 01110100  
01100101 00101110
```

Information:

During the winter season, small frozen particles of precipitation fall and accumulate on the ground.

Meaning:

I love the nostalgic feeling I get from seeing glistening white snow. It reminds me of cozy holidays with my parents. But I hate shoveling the driveway. It would be bizarre if snow was green or orange.

**Computers and AI process data.** They can manipulate data which we interpret as information that we can understand and benefit from; but **they do not touch upon meaning** except insofar as we attribute meaning to things.

However, with the increased proliferation of computing, **many people conflate notions of data, information, meaning, truth, and wisdom.** Deeper (more ‘*meaningful*’) conceptions of meaning derive from personal and shared concrete experiences, subjective connections, first-hand experiences, etc., that are not reducible to descriptive data about those experiences.

By conflating these things, **we risk unconsciously allowing information and communication systems to determine our values, our identities, and our nature as human beings.** Information systems can, without us being aware, have a significant impact on our ideas about what is important for us to know; what is important for us to be able to do; how we should spend our time; and how we should connect to others.

***Without vocabulary related to meaning, information, and data, it can be difficult to think about the role remaining for human beings in an age when machines “compute” information far better than human beings do, and when meaning is often measured in terms of utility.***

## Truth, Stability, and Slow Thinking

Some suggest that the rapid pace of information flow—which will only increase with AI—compromises other human virtues and activities.

“The digital order puts an end to the *age of truth* and introduces the *post-factual information society*. [...]. **Anything time-consuming is on the way out. Truth is time-consuming.** Where bits of information come in quick succession, we have *no time for truth* [...]. Everything that stabilizes human life is time-consuming. **Faithfulness, bonding and commitment are time-consuming practices** [...]. Today, we pursue information without gaining *knowledge*. **We take notice of everything without gaining any insight** [...]. **We communicate incessantly without participating in a community. We collect vast quantities of data** without following up on our *recollections*. We accumulate ‘friends’ and ‘followers’ without meeting an *Other*. **In this way, information develops a form of life that has no stability or duration**” (Byung-Chul Han, *Non-Things*, p. 6-7).

## Education and “Arriving” Technologies

Following from the preceding points, [some authors distinguish between “adoption” technologies and “arrival” technologies.](#)

In the past, educational institutions adopted technologies after extensive thought, planning, and investment. With practically all students having autonomous access to the internet through their phones and other devices, educators are now having to contend with technologies that simply *arrive*. This was the case with ChatGPT and other generative AI software, and *is likely to continue to be the case* with new emerging software.

One of the implications is that education will even more directly be subject to the influence and chosen goals of private, for-profit industry. Educational institutions will need to consider more proactive ways of confronting such technological developments.

## A World Without Resistance or Mystery

AI and computing reduce meaning to information—which is always ready, puts up no resistance to us, leaves no mystery, and no room for us to do interpretive work (*Non-Things*, p. 59). That is, **AI presents information and ‘meaning’ in a neat package, eliminating the need for us to investigate. It saves us the burden of research, time-consuming contemplation, and the emotional work of living with mystery.**

This gives way to several risks. **We risk diminishing our engagement with the world, with created and natural objects. We risk abandoning our meaning-making activities—expression, creativity, community, research, etc.—believing that AI has and will do this ‘work’ for us.**

These seemingly theoretical considerations are essential for properly framing the context, possible rewards, and possible risks of different approaches to dealing with generative AI in higher education.

## The first step is to begin posing some questions to yourself and your colleagues:

1. *What sorts of activity and meaning does my discipline include besides computation or manipulation of data?*
2. *What kinds of attitudes and abilities (linguistic, communicational, creative, affective, critical, etc.) are essential to my discipline?*
3. *How does my discipline contribute to broader human flourishing and what role do human beings play in this added value?*  
*(E.g., Why might we generally care about understanding math ourselves rather than letting machines do math for us?)*
4. *If students used AI to do their work, how would this affect their general development and the cognitive/affective/creative work that might normally be involved in my discipline?*
5. *If AI became regularly used in my discipline, how might that change the social, political, and economic environment in which work in my discipline is carried out?*  
*(Would jobs be lost? Would interpersonal interaction become less common in my field? Would the kinds of knowledge that students need to succeed change? Would the social, economic, or political significance of the discipline change?)*

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