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for Academic
Integrity

Implications of Artificial Intelligence for Academic Integrity

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Academic Integrity and Artificial Intelligence



- Ethics **of** artificial intelligence
 - What technology should (not) do
- Artificial intelligence **to ensure** academic integrity
 - Intrinsic plagiarism detection, proctoring etc.
- Artificial intelligence's **implications for** academic integrity
 - Automated content generators
 - Impact on education

Why Computers Were Invented?

- To help with tedious repetitive tasks
 - Humans are slow and prone to errors
- Wartime: Trying keys to decrypt Enigma
- Peacetime: Commercial applications
 - Performing arithmetic operations
 - Sorting and searching data

Development of Artificial Intelligence

- Since 1950s Expert systems, rules
- The rules don't work well for natural language processing
 - “Every time I fire a linguist, the performance of the system goes up.”
(Fred Jelinek, IBM Research, 1985)
- Recommender systems
 - Customers who bought this, also bought...
 - Those who searched for this term / liked this post /bought this product, were also interested in...
- 21st century – machine learning
 - Basically mathematics (statistics)

SCIgen



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- Scientific paper generator
- Developed in 2005 at MIT
- The output looked like scientific papers
 - Structure, form, citations, diagrams...
- The text was complete nonsense
- 2005: A SCIgen-generated paper was accepted to a IEEE-sponsored World Multiconference on Systemics, Cybernetics and Informatics
- Since then, widely used by Chinese academics
- 2013: 122 SCIgen-generated papers retracted by Springer and IEEE

SCIgen

- The authors of the tool never intended to deceive readers
- The aim was to “maximize amusement”
- The generated text was nonsense
- They showed lack of peer review at WMSCI conference
- SCIgen is a useful tool to identify predatory conferences and journals
 - IEEE and Springer got caught into this trap 😞
- Who violated academic integrity in this case?
- The conference organizers / publishers / reviewers
- Not the SCIgen authors!

Since then, the technology moved forward

- GPT-3 (Generative Pre-trained Transformer model, third generation)
- Developed by OpenAI in 2020
- Language model based on word context
- Learned from WWW, Wikipedia, books
- Trained to predict following words
- Based on a short seed, it can generate arbitrarily long text
 - It is possible to specify genre, tone (persuasive, friendly, professional,...)
 - Randomness – no text match with existing documents
 - Undistinguishable from human-written text

AI-Generated Text

My input:

Implications of the artificial intelligence text generators for university education

AI output (<https://beta.openai.com/playground>):

The implications of the artificial intelligence text generators for university education are far-reaching. The technology has the potential to revolutionize the way in which students learn and how information is disseminated.

One of the most significant implications is that the technology can be used to create personalized learning experiences for students. The text generators can be used to create customized content that is tailored to the individual needs of each student. This would allow for a more efficient and effective learning experience, as students would be able to focus on the material that is most relevant to them.

Another implication is that the technology can be used to create more engaging and interactive learning experiences. The text generators can be used to create texts that are more interactive and allow for more user input. This would create a more immersive and engaging learning experience for students.

Finally, the text generators can be used to create texts that are more easily understandable. The technology can be used to create texts that are easier to read and comprehend. This would allow for a more effective and efficient learning experience, as students would be able to understand the material more easily.

AI-Generated Art

Conference presentation



Academic integrity



AI-Generated Art

Artificial intelligence



Future university education



Questions

- Who is the author of the content?
 - How to cite it?
- How to assess it?
 - Even if the teacher know how it was produced
- What counts? Original ideas!
 - AI for proofreading and stylistic improvements (Grammarly)
 - Where is the borderline of the edits/suggestions that don't influence ideas?

Helper Tools for Academic Writing

- Google Translate, DeepL Translate
- Grammarly
- Writefull (trained on academic publications)

- Is it OK for academics to use these tools?
- Is it OK for students to use these tools?

Alla Katsnelson (2022): Poor English skills? New AIs help researchers to write better. Nature.
<https://www.nature.com/articles/d41586-022-02767-9>

Ethical considerations of large text models

- Timnit Gebru, former head of Google AI ethics
- The paper was never published, Gebru was fired from Google
- Training – energy consumption / carbon footprint
- Training from the internet bias
 - Content - racist, sexist, abusive (AI sees as normal)
 - Further marginalization of already marginalized communities
 - Too large data are impossible to audit – inherent risk

Source: <https://www.technologyreview.com/2020/12/04/1013294/google-ai-ethics-research-paper-forced-out-timnit-gebru/>

What Comes Next?

Nobody Knows...

- *"I think there is a world market for maybe five computers.,,"*
Thomas Watson, Chairman of IBM, 1943
- *"There is no reason for any individual to have a computer in his home."* (Ken Olsen, President of Digital Equipment Corp., 1977)
- *"640K [of RAM] ought to be enough for anybody"*
(Bill Gates, Microsoft, 1981)
- We don't know how the technology develops in 20 or 50 years
- But we have to prepare students for that



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What are the implications of AI content generators for academic integrity?

Academic Integrity Implications



- What if students want to avoid tedious repetitive tasks?
 - E.g. writing boring pointless assignments...
- Lot of educators are afraid
- How do we stop students from using AI
 - to get unallowed assistance with their assignments?
- Are we focusing on the right issue?

Academic Integrity Paradigms

- Prevention of student misconduct
 - William Bowers 1964, Don McCabe 1992
 - More than half of the students cheat (at least once) during their studies
 - Misconduct is a moral issue → Honor codes, moral development of students
- Misconduct as a teaching/learning issue
 - “How do we stop students from cheating?” → “How do we ensure students are learning?” (Bertram Gallant, 2008)
 - Focus on teachers: Role models, should explain, should motivate
- Systemic approach
 - Academia is part of human society
 - Focus on positive values

Academic Integrity

- Is much more than absence of cheating...
- Compliance with ethical and professional principles, standards, practices and consistent system of values, that serves as guidance for making decisions and taking actions in education, research and scholarship.
([European Network for Academic Integrity](#))
- Fundamental values of academic integrity:
Honesty, trust, fairness, respect, responsibility, courage
- The values are relevant for all stakeholders, not just students

Systemic Approach to Academic Integrity

- Pabian, P. (2015). Why ‘cheating’ research is wrong: new departures for the study of student copying in higher education. *Higher Education* (2015) 69:809-821
 - Ethnographic study in Czech higher education
- Academics are rewarded mostly for publications, not teaching
- Teaching is an obstacle for publication activity
 - → Should take as little time as possible
- „In the teaching/learning situations that we observed, teachers **‘transmit’** knowledge to students, who are expected to **‘replicate’** it in exams, which students manage by either memorization or copying“
- „either way, students are **excluded from knowledge construction**“
- Cheating? → **Natural response to educational setting**



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Does AI mean revolution in education?

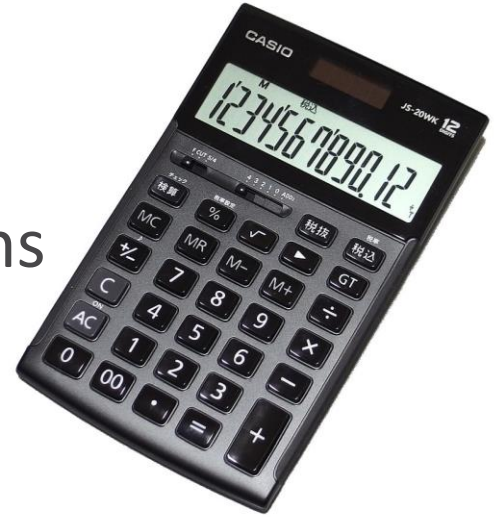
Letterpress Printing

- Before: Universities had monopoly to educational materials
 - Lecture = reading
- After: Students can read materials themselves
 - No point in reading at the lecture
- Different activities at classes
 - Explanation, discussion,...



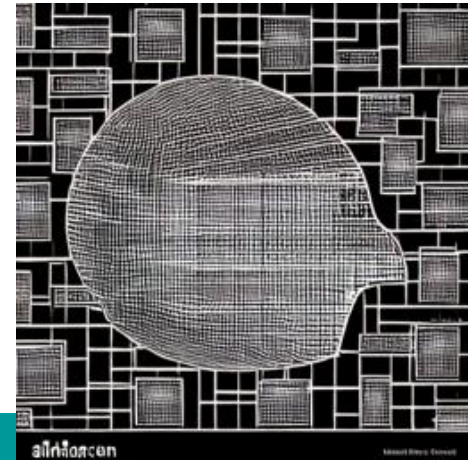
Calculator

- Perform tedious arithmetic operations
- Forbidden when learning how to perform arithmetic operations
- Useful tool in higher-level math



Automated Content Generators

- Just another tool that moves education forward
- As soon as students acquire necessary skills
 - Students can benefit from AI tools
 - AI can enrich classes

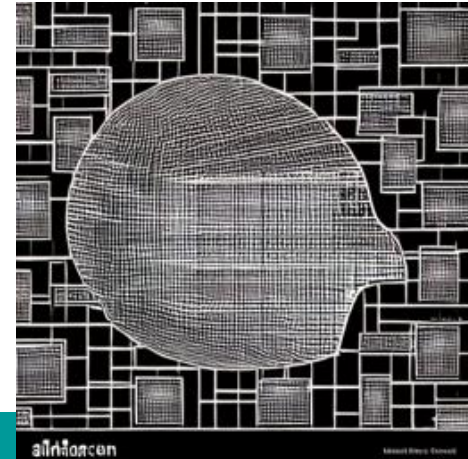


Focus on Learning Goals



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- In certain stages of learning, some tools are forbidden
 - When learning handwriting, printer is forbidden
 - When learning basic math, calculator is forbidden
- Then, students make use of these tools
 - They learn how to use them
 - To save time and effort
 - To produce better results



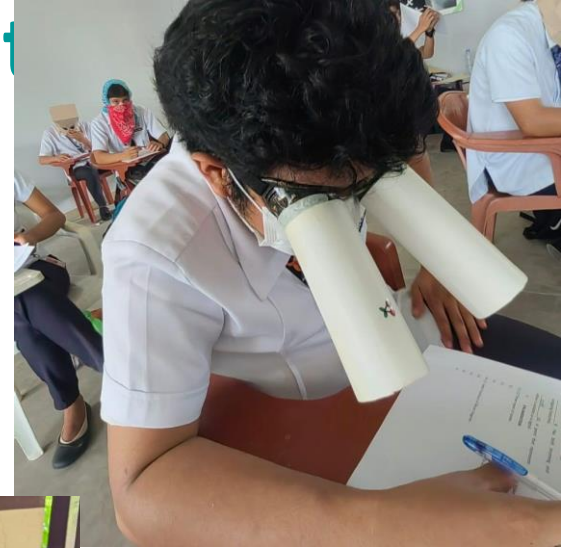
Forbidden Tools

- How do we ensure students don't use them?
- How do we ensure pupils don't use calculators when learning basic math?
- How do we ensure students don't use content generators when learning academic writing?

How Do We Enforce the Rules?

- Emphasize intrinsic motivation
 - If students **want to learn**, AND **understand how not using AI helps them** to learn, they won't use it
 - If students **see the purpose of the task**, they will fulfil it with integrity
- Invigilate
 - Assignments written at home? Don't be naïve!
 - **5-8 %** of students hire professional writers
 - **Up to 20 %** of students receive unallowed assistance from their peers or relatives
 - **?? %** of students use AI tools

Philippines: Student 'anti-cheat' exam hats go viral



Cheating at Written Exams

- How do we prevent students from copying from their peers?
 - Exam room setting
 - Distance between seats
 - Random sitting order
 - Invigilation
 - Test design
 - Large bank of question alternatives
 - Random order of questions and options
- What kind of cheating makes the headwear easier?
 - Hidden cameras
 - Ear-plugs
- Prevention of copying may be an incentive to contract cheating

AI Content Generators & Contract Cheating

- Contract cheating
 - Term coined by Clarke and Lancaster in 2006
 - Billion-dollar globalized market; Increasing
- AI content generators cause much more hype
- Use of AI tools
 - No fundamental difference from contract cheating
 - Lower barrier than contract cheating
- Contract cheating providers have access to AI



Does artificial intelligence threaten academic integrity?

No.

**It threatens just
meaningless assignments.**

What Can We Do?

- Acknowledge that we can't stop students using AI
 - Maybe rethink our assessment strategies
- Make it clear when AI is allowed
 - like in case of a calculator in math
- Don't consider AI as a threat, use it as an opportunity
 - Explore the options, try to embed it in classes

Possible Solutions

- Talk with students in class about AI technology
- Allow AI for inspiration, but require acknowledgement
- Ensure that university processes and local procedures make it clear what level of AI use is acceptable
- Get students to evaluate the quality of AI solutions in their field
- Have arts students use AI solutions to build a creative and consistent portfolio
- Set a real-world or authentic assignment where students use AI technologies
- Develop assignments that rely on local knowledge or processes
- Use staged, supervised or interactive assessment types

It's Too Early for Conclusions...

- We need more research
 - How many students are using AI tools?
 - What do they do with the results?
 - To what extent is machine-generated content machine-detectable?
- We need inspiration
 - How to effectively embed AI into classes
 - How to motivate students not to use it
 - In cases AI is not allowed
 - How to ensure using AI in allowed way

Thank You!



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