

GENERATIVE AI IN EDUCATION

Professor Weng Marc Lim

Dean, Sunway Business School

Contact: @limwengmarc or marcl@sunway.edu.my







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Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

Volume 21 | Issue 2 | July 2023 | ISSN 1472-8117

The International Journal of Management Education



Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators

Weng Marc Lim^{a,b,c,*}, Asanka Gunasekara^b, Jessica Leigh Pallant^b,
Jason Ian Pallant^b, Ekaterina Pechenkina^d

^aSunway Business School, Sunway University, Sunway City, Selangor, Malaysia

^bSchool of Business, Law and Entrepreneurship, Swinburne University of Technology, Hawthorn, Victoria, Australia

^cFaculty of Business, Design and Arts, Swinburne University of Technology Sarawak Campus, Kuching, Sarawak, Malaysia

^dLearning Transformations Unit, Swinburne University of Technology, Hawthorn, Victoria, Australia

ARTICLE INFO

Keywords:

academic integrity
artificial intelligence
chatGPT
critical analysis
digital transformation
ethics
future of education
generative AI
generative artificial intelligence
journal
education
education
management education
management educator
openAI
paradox
paradox theory
Ragnarök
reformation
transformation
transformation
transformational education

ABSTRACT

Generative artificial intelligence (AI) has taken the world by storm, with notable tension transpiring in the field of education. Given that Generative AI is rapidly emerging as a transformative innovation, this article endeavors to offer a seminal rejoinder that aims to (i) reconcile the great debate on Generative AI in order to (ii) lay the foundation for Generative AI to co-exist as a transformative resource in the future of education. Using critical analysis as a method and paradox theory as a theoretical lens (i.e., the “how”), this article (i) defines Generative AI and transformative education (i.e., the “ideas”), (ii) establishes the paradoxes of Generative AI (i.e., the “what”), and (iii) provides implications for the future of education from the perspective of management educators (i.e., the “so what”). Noteworthy, the paradoxes of Generative AI are four-fold: (Paradox #1) Generative AI is a ‘friend’ yet a ‘foe’, (Paradox #2) Generative AI is ‘capable’ yet ‘dependent’, (Paradox #3) Generative AI is ‘accessible’ yet ‘restrictive’, and (Paradox #4) Generative AI gets even ‘popular’ when ‘banned’ (i.e., the “what”). Through a position that seeks to embrace rather than reject Generative AI, the lessons and implications that emerge from the discussion herein represent a seminal contribution from management educators on this trending topic and should be useful for approaching Generative AI as a game-changer for education reformation in management and the field of education at large, and by extension, mitigating a situation where Generative AI develops into a Ragnarök that dooms the future of education of which management education is a part of (i.e., the “so what”).

* Corresponding author. Sunway Business School, Sunway University, Sunway City, Selangor, Malaysia.

E-mail addresses: lim@wengmarc.com, marcl@sunway.edu.my, marclim@swin.edu.au, wlim@swinburne.edu.au (W.M. Lim), agunasekara@swin.edu.au (A. Gunasekara), jipallant@swin.edu.au (J.I. Pallant), jipallant@swin.edu.au (J.I. Pallant), epechenkina@swin.edu.au (E. Pechenkina).

<https://doi.org/10.1016/j.ijme.2023.100790>

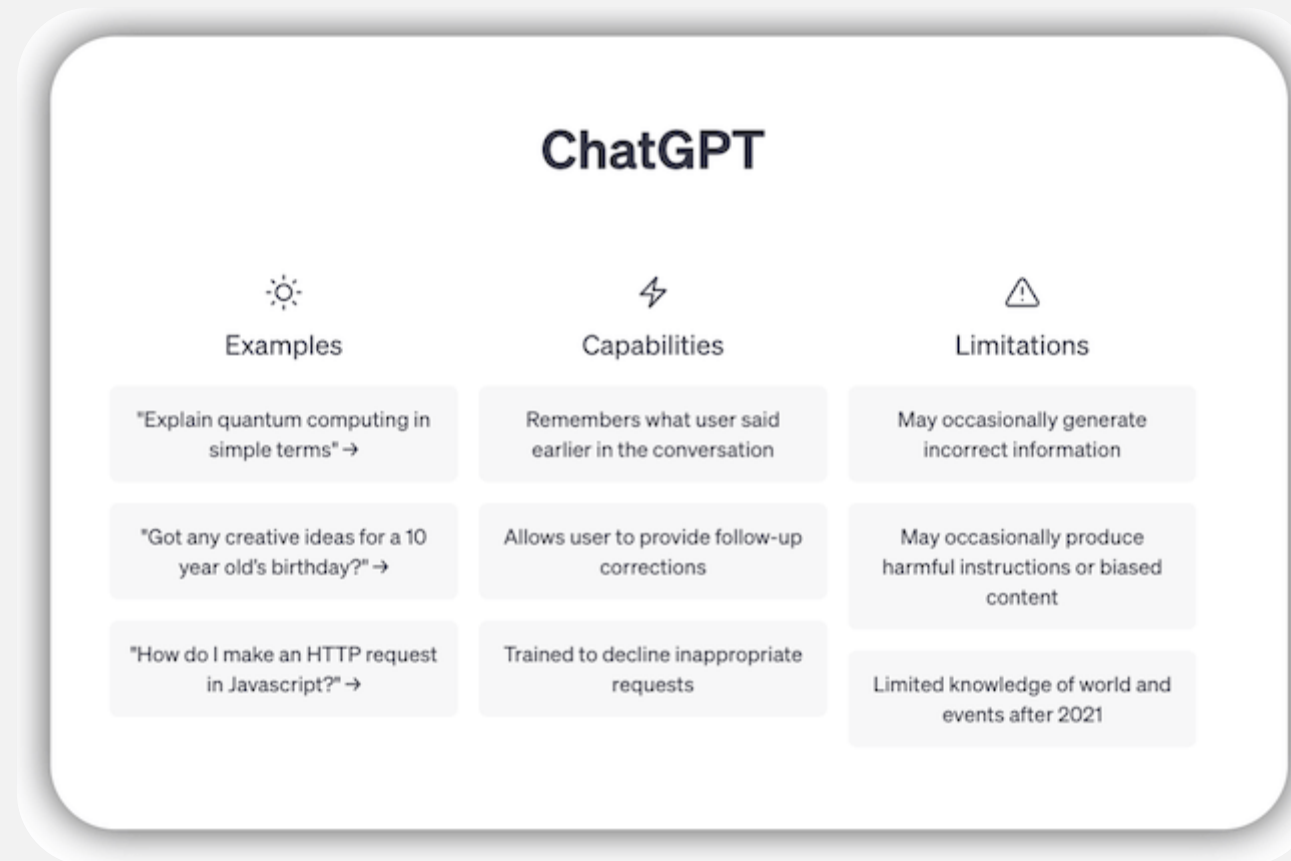
Received 9 February 2023; Received in revised form 16 February 2023; Accepted 17 February 2023

Available online 1 March 2023

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GENERATIVE AI

... a type of artificial intelligence that can generate human-like content in response to complex and varied prompts



PARADOX

... a situation or statement that appears to contradict itself, yet might be true



PARADOX #1: GENERATIVE AI IS A 'FRIEND' YET A 'FOE'

Positive

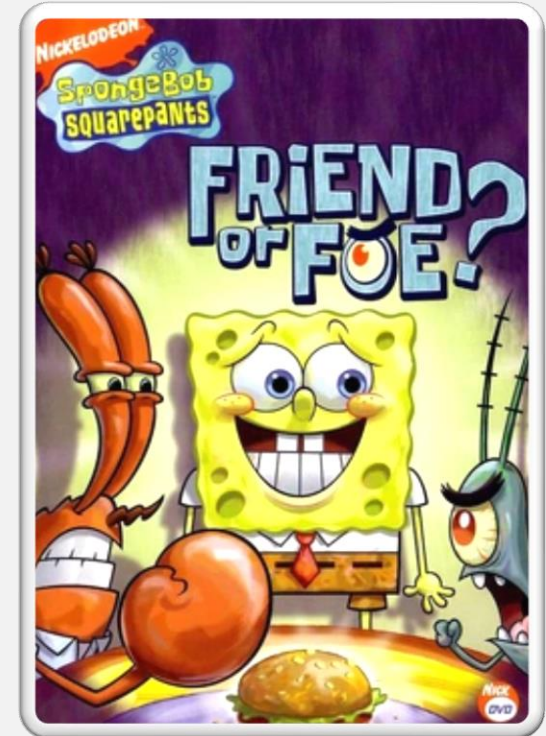
- Enhances knowledge acquisition and elevates assessment rigor.

Negative

- Blurs line between new and recycled knowledge, may make assessments redundant.

Implication

- Requires careful design in educational settings for maximum benefit.



PARADOX #2: GENERATIVE AI IS 'CAPABLE' YET 'DEPENDENT'

Positive

- Highly capable in delivering responses.

Negative

- Quality depends on prompts and training.

Implication

- Educate users to maximize benefits.



PARADOX #3: GENERATIVE AI IS 'ACCESSIBLE' YET 'RESTRICTIVE'

Positive

- Democratizes education.

Negative

- Usage may be restricted.

Implication

- Need for equitable conditions to realize impact.



PARADOX #4: GENERATIVE GETS 'POPULAR' WHEN 'BANNED'

Positive

- Gains popularity via the Streisand effect and psychological reactance.

Negative

- May be banned for perceived threats.

Implication

- Educational institutions should embrace and strategize, not shun, Generative AI.



CONCLUSION

Ways forward

- Embrace Generative AI as a tool, not a threat
- Educate users for responsible usage
- Prioritize equity in access and benefits
- Keep evaluating and iterating for continuous improvement



Who is the winner of the Australian Open in 2023?

I'm sorry, I don't have information about the winner of the 2023 Australian Open as my training data only goes up until 2021 and the event has not yet taken place.

Fig. 1. ChatGPT acknowledging its limitation.

Which country won the 2022 FIFA World Cup in Qatar?

The winner of the 2022 FIFA World Cup in Qatar was France.

Fig. 2. ChatGPT revealing an incorrect answer when it disregards its limitation.

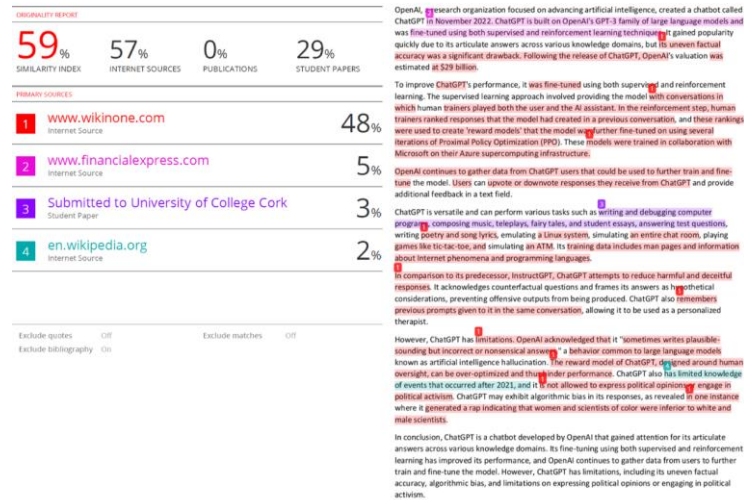


Fig. 3. Similarity index of a paraphrased essay about ChatGPT by ChatGPT based on a Turnitin plagiarism scan.

What is marketing insights? I want you to include relevant examples. Your answer should also be cited and the corresponding list of references should also be included.

Marketing insights refer to a deep understanding of the market, consumers, and competition, gained through research and analysis, which guides marketing strategy and decision making.

Examples of marketing insights include:

1. Consumer behavior: Understanding how consumers make purchasing decisions, what motivates them, and their preferences.
2. Market trends: Understanding changes in consumer demands, market dynamics, and the impact of external factors such as the economy and technology.
3. Competitor analysis: Understanding the strengths, weaknesses, and strategies of competitors, as well as their target audience and positioning.
4. Customer segments: Identifying specific groups of consumers with common needs and characteristics, and developing tailored marketing strategies for each segment.
5. Pain points and needs: Identifying the problems and needs of customers, and developing solutions and products that address them.
6. Brand perception: Understanding how consumers perceive a brand, and how to improve or maintain brand image.

These insights help organizations to identify opportunities, develop effective marketing plans, and make data-driven decisions.

References:

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Fig. 6. ChatGPT providing an elaborate response with references.

Table 1
A paradoxical perspective of Generative AI and transformative pathways for the future of education.

Takeaways	Generative AI	Definition	Transformative education	Definition		
		<ul style="list-style-type: none"> Generative AI can be defined as a technology that leverages deep learning models to generate human-like content in response to complex and varied prompts. 		<ul style="list-style-type: none"> Transformative education can be defined as education that is transformative in its process and product in response to grand challenges. 		
Lesson 1/→	Paradox	Positive	Negative	Key implications	Guidelines for practice	Directions for research
<ul style="list-style-type: none"> To scope expectations and secure the best results, Generative AI users can: <ul style="list-style-type: none"> Be complete and specific in prompts. Engage in laddering (e.g., clarifying with examples, structured questioning). Keep in mind the technology's limitation and be ready to engage in further work. 	<ul style="list-style-type: none"> Paradox #1: Generative AI is a 'friend' yet a 'foe' 	<ul style="list-style-type: none"> Generative AI is a 'friend' when it facilitates knowledge acquisition through timely and human-like responses. Generative AI is a 'friend' when it elevates the rigor in assessment. Generative AI is a 'friend' when it realizes its capability in offering true information. Generative AI is a 'friend' when the information it provides is used ethically or with good intention. 	<ul style="list-style-type: none"> Generative AI is a 'foe' when it makes it difficult to ascertain novel versus recycled knowledge. Generative AI is a 'foe' when it threatens to make assessment redundant. Generative AI is a 'foe' when it reveals its flaws in offering false information. Generative AI is a 'foe' when the information it provides is used unethically or with ill intention. 	<ul style="list-style-type: none"> Generative AI can accelerate learning and thus the discovery of new knowledge, though distinctions on novel and recycled knowledge need to be sorted effectively. Generative AI can serve as an impetus to reform the design of assessments and elevate them to a higher level in terms of critical analysis and rigor, whereas sticking to traditional ways of assessing may very well be a recipe for disaster. Generative AI can serve as a useful informant to users in education, though caution should be afforded due to its susceptibility to information disorders such as disinformation and misinformation. Generative AI will inherently have an impact on academic integrity, including its improvement. Generative AI is inherently neutral but could be trained to promote the good and mitigate the bad among users in education. 	<ul style="list-style-type: none"> Adopt Generative AI as a tool to transform and support educational activities. Engage in authentic and problem-based/industry-focused assessments where both the process and product of Generative AI-human collaboration are assessed. Engage in fact checking and verification for information produced by Generative AI while feeding it with more information/prompts in tandem with upgrading of deep learning algorithms to allow it to detect and correct its flaws. Establish and periodically revise policies and guidelines for ethical use of Generative AI in education as and when the technology advances and develops over time. Establish Generative AI protocols that can alert users and institutions on potential criminal and unethical engagement, as well as opportunities to improve proficiency. 	<ul style="list-style-type: none"> What educational-related problems and tasks can Generative AI tools address, and how well do they fare? Which assessment designs or types can most effectively integrate Generative AI, how can they be varied, and how can educators and students be encouraged to engage in such assessments and tools productively and productively? How can Generative AI be trained to evaluate and make trustworthy decisions, and how can educators and students also engage in counter-checking of the responses produced by such tools? What is the impact of Generative AI on academic integrity policies, how can institutions encourage educators and students to use Generative AI while maintaining academic integrity, and what, if any, methods should educators use to detect use of Generative AI in assessment submission? How can Generative AI tools be trained to detect potential criminal and unethical engagement as well as opportunities to improve proficiency, and performance (i.e., the 3 P's) in education, and how well do they fare? <p><i>(continued on next page)</i></p>

Table 1 (continued)

Takeaways	Generative AI	Definition	Transformative education	Definition		
		<ul style="list-style-type: none"> Generative AI can be defined as a technology that leverages deep learning models to generate human-like content in response to complex and varied prompts. 		<ul style="list-style-type: none"> Transformative education can be defined as education that is transformative in its process and product in response to grand challenges. 		
Lesson 1/→	Paradox	Positive	Negative	Key implications	Guidelines for practice	Directions for research
	<ul style="list-style-type: none"> Paradox #2: Generative AI is 'capable' yet 'dependent' Paradox #3: Generative AI is 'accessible' yet 'restrictive' Paradox #4: Generative AI gets even 'popular' when 'banned' 	<ul style="list-style-type: none"> Generative AI is 'capable' in delivering responses. Generative AI is 'accessible' for people to use. Generative AI is 'popular' for its value, even more so from the Streisand effect and psychological reactance. 	<ul style="list-style-type: none"> Generative AI is 'dependent' on the quantity and quality of prompts and the type of training it receives in delivering responses. Generative AI is 'restrictive' in what and how much people are allowed to use. Generative AI gets 'banned' for its supposed threats (e.g., academic integrity, ethics). 	<ul style="list-style-type: none"> Generative AI education is necessary to enable its users in education to make the best use of its tools and maximize the returns from its usage. Generative AI can democratize the power of education, though any conditions imposed will need to be managed equitably in order to realize its impact potential. Generative AI is inevitable and banning it will likely drive students to want access more through heightened attention and psychological reactance, and thus, educational institutions should embrace rather than shun its use. 	<ul style="list-style-type: none"> Develop Generative AI educational modules to upskill and reskill educators and students. Establish a sustainable model for Generative AI that would promote equitable access in education. Establish and promote the use of Generative AI for education and its best practice instead of banning or limiting it. 	<ul style="list-style-type: none"> productivity, and performance in education. What are the strengths and shortcomings of different categories of Generative AI tools, how can educators and students be trained to effectively use such tools, and how do different training methods and programs fare in improving the proficiency, productivity, and performance (i.e., the 3 P's) of its users in education? What are the roles of the developers and educational institutions in creating and maintaining access to Generative AI tools for students, how can such access be made equitable and sustainable, and how would this impact on the equity of student learning experience among different student groups along with their academic and non-academic performance in the short and long run? How do students perceive and respond to policies regarding Generative AI, how does banning its use impact on students accessing such tools outside educational settings, and how can Generative AI be built into education in a meaningful way?

A large banner for Sunway University is displayed on a stand. The banner features the text "SUNWAY UNIVERSITY" in a bold, sans-serif font, with "SUNWAY" on the top line and "UNIVERSITY" on the bottom line. To the right of the text is a stylized graphic of a hand holding a globe. The background of the banner is a light blue color. The banner is set against a backdrop of a modern university building with a glass facade and a walkway with people walking.

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