

BIG DATA

RT 1 - 675.8965 - 874.8374  
SH - 456/9583 - 472.8921  
G - 8943 - 6754

29034 - 85943  
30945 - 86741  
32905 - 87493

B - 784.905

RT - 7832 - 9043 - 7841  
[004] 895 - 785.5  
UT - 847 - 26

54 - 7854 - 9502 - AV

# Evaluation and Impact

Stephen Downes

December 14, 2021

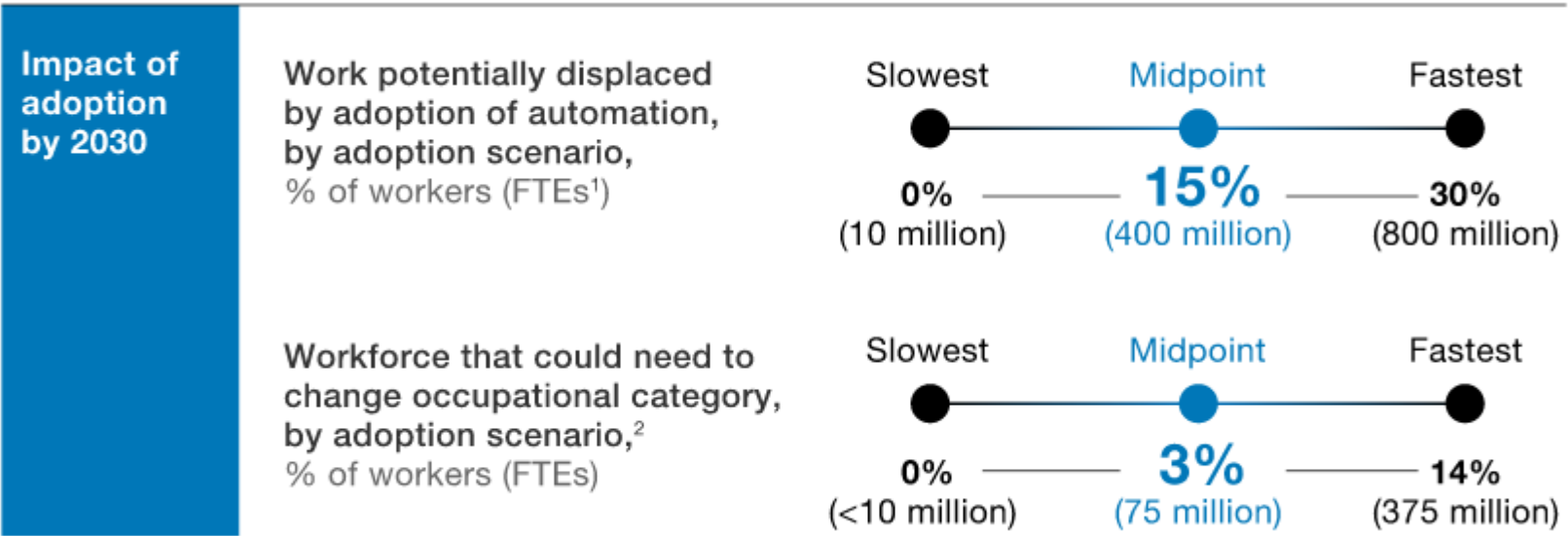
02.894  
3.904  
9.902  
14.673  
19.784  
36.903  
42.842  
48.993  
53.894  
60.784  
68.082  
73.073  
79.006  
83.074  
85.784  
97.116  
100

ANALYSIS  
112 - 8943 - 9037 - DE

2673 - 9483 - 0084 - 7923  
0094 - 8932 - 0085 - 7731

# Evaluation

- By evaluation here we don't mean testing to determine whether the AI or analytics application works
- Rather, we want to establish whether the use of AI in the field produced satisfactory results



<https://www.mckinsey.com/featured-insights/artificial-intelligence/the-promise-and-challenge-of-the-age-of-artificial-intelligence>

# A Wider Context

- Evaluation in this sense takes into account a much wider context
- Factors that have nothing to do with the design and development of AI come into play

For example, “the European Union’s executive proposed legislation aimed at encouraging widespread sharing and reuse of industrial data and protected public sector data-sets — such as health data, environment, energy, agriculture, mobility, finance, manufacturing, public administration and skills.”



<https://techcrunch.com/2021/12/01/data-governance-act-provisional-agreement/>



# Analyzing Activities

For example: analytical framework for student activities

- Goals: can learners set their own learning goals?
- Action: does the learner design their own activities?
- Strategy: can the learner set learning strategies?
- Reflection: what are the mechanisms for reflection?
- Content: do learners select their own content?
- Monitoring: can learners monitor their progress?

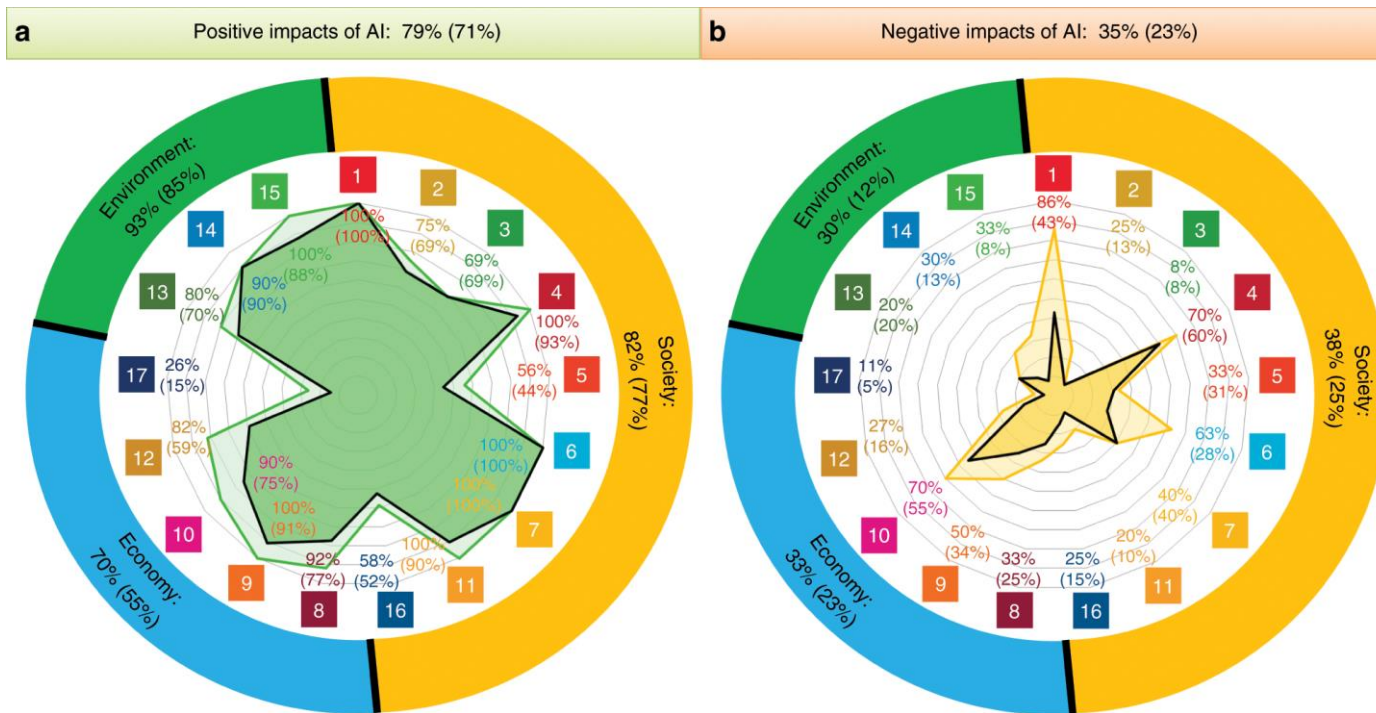
Types of mobile activities		Learners' agency dimensions					
		goals	content	actions	strategies	reflection	monitor
Direct Instruction	<i>Location guidance</i>	X	X	X	✓	X	X
	<i>Procedural guidance</i>	X	✓	X	X	✓	✓
	<i>Metacognitive guidance</i>	X	✓	✓	✓	✓	X
Access to content	<i>Fixed content</i>	X	X	✓	✓	X	X
	<i>Dynamic content</i>	✓	✓	✓	✓	✓	X
Data collection	<i>Cooperative data collection</i>	✓	✓	✓	✓	✓	X
	<i>Collaborative data collection</i>	✓	✓	✓	✓	✓	✓
Peer-to-peer communication	<i>Social asynchronous</i>	✓	✓	✓	✓	✓	✓
	<i>Social synchronous</i>	✓	✓	✓	✓	✓	✓
Contextual support	<i>Augmented experience</i>	✓	X	✓	✓	✓	X
	<i>Immersive experience</i>	✓	✓	✓	✓	✓	✓
	<i>Adaptive feedback</i>	✓	✓	X	✓	✓	✓

ÁngelSuárez;Marcus Specht;Fleur Prinsen;Marco Kalza;Stefaan Terniera, 2018, A review of the types of mobile activities in mobile inquiry-based learning, Computers & Education, volume 118, March 2018 pp. 38-55

<https://www.sciencedirect.com/science/article/pii/S0360131517302397>

# Wider Frameworks

For example, are AI and learning analytics supporting the U.N. Sustainable Development Goals?



# Impact



What is the ‘good’ of an analytics engine?

- We might say it’s better grades or improved competencies, or even greater quality of life for students.
- Perhaps it’s organizational efficiency on the part of the university. Or perhaps it’s just profit.
- As danah boyd says, “How does a company have values beyond profit for shareholders?” (quoted from Kinstler, 2020).

# Undesired Impact

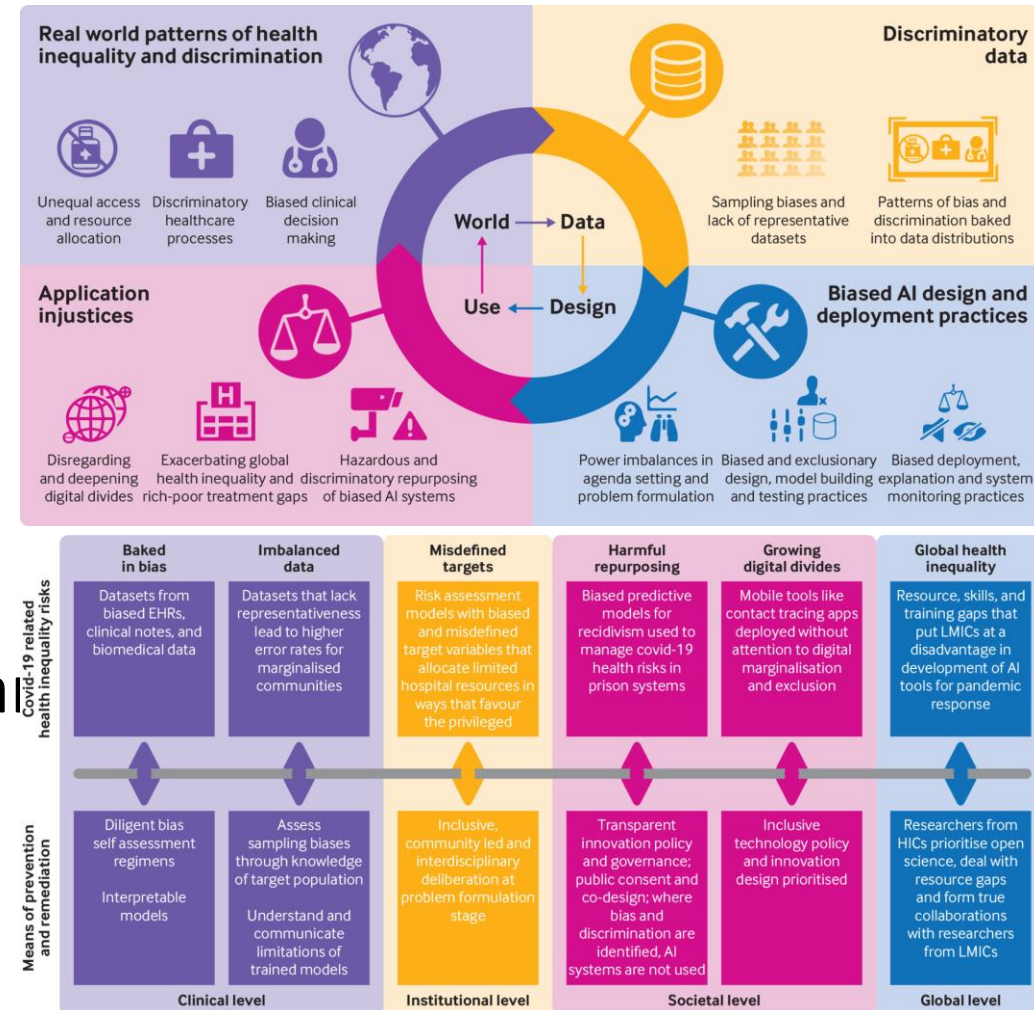




# Assessing Impact as Risk

“Some documents use the terminology of potential harm and others call for the identification of risks. The emphasis, particularly among the latter category of documents, is on prevention, and impact assessments are an accountability mechanism because a sufficiently dire assessment (where risks are ‘too high or impossible to mitigate’ 79) should prevent all AI technology from being deployed or even developed.” (Fjeld, et.al., 2020:30)

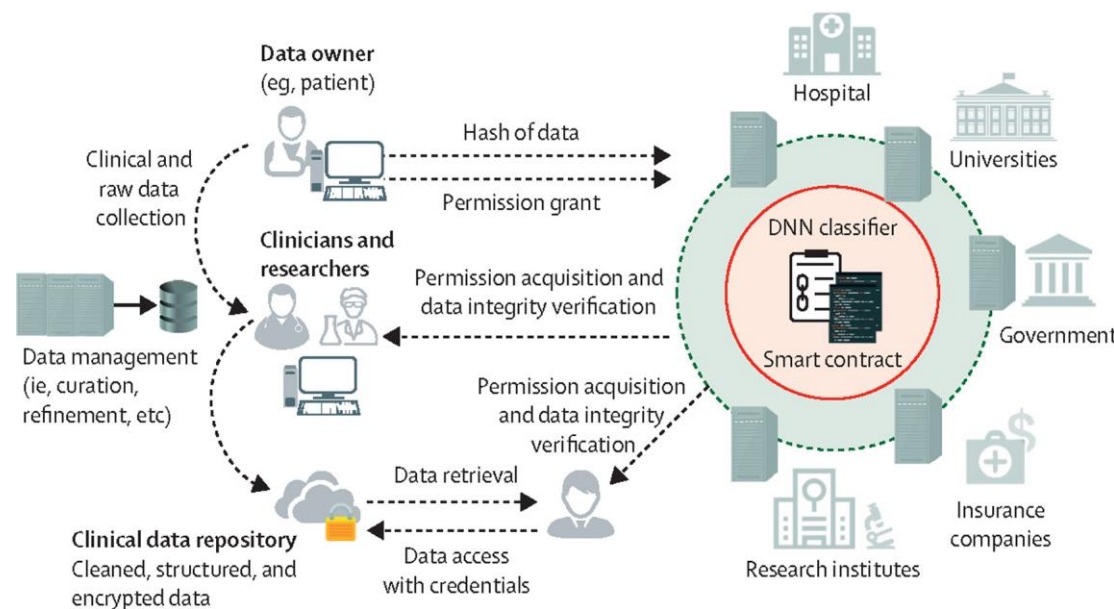
<https://www.bmj.com/content/372/bmj.n304>





# What Is The Data Trail?

“Effective learning analytics **MUST** lead to responsible assessment and effective use of the data trail. What do we do with the data.”



For example, absence. “Absence is a vague and undefined term in online courses. Absence in the online course does not necessarily equate to inactivity, non-performance or no progress by the student. In the online discussion forum, for example, an online learner is a reader as well as a contributor. Lurking or reading behavior is probably one of the most prominent activities in the discussion board, yet there is no reliable way to measure it meaningfully.” (Dringus, 2012)

[https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(21\)00210-7/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(21)00210-7/fulltext)

# Use

Example: What makes the surveillance culture ethically questionable is the use to which surveillance is put.



“The point is that it doesn’t matter which technology is used to identify people... The whole purpose of this process is for companies — and governments — to treat individuals differently. We are shown different ads on the internet and receive different offers for credit cards. Smart billboards display different advertisements based on who we are. In the future, we might be treated differently when we walk into a store, just as we currently are when we visit websites.” (Schneier, 2020)

<https://digitaldm.com/digital-home-reinventing-signs-billboards-jukeboxes/>

# Ethical Decisions Actually Made

- Evaluation considers the decisions actually made in the field:
  - Drones with machine guns
  - Cars that protect occupants first
- Subsequent analysis projects what the ethics *actually are* in the environment



<https://www.newscientist.com/article/2227168-turkey-is-getting-military-drones-armed-with-machine-guns/>

Charlie Sorrel. (2016). Self-Driving Mercedes Will Be Programmed To Sacrifice Pedestrians To Save The Driver. Fast Company, October 13, 2016. <https://www.fastcompany.com/3064539/self-driving-mercedes-will-be-programmed-to-sacrifice-pedestrians-to-save-the-driver>



# Impacts and Narratives

What is the impact of media manipulation and fake news? David Karpf contrasts two narratives:

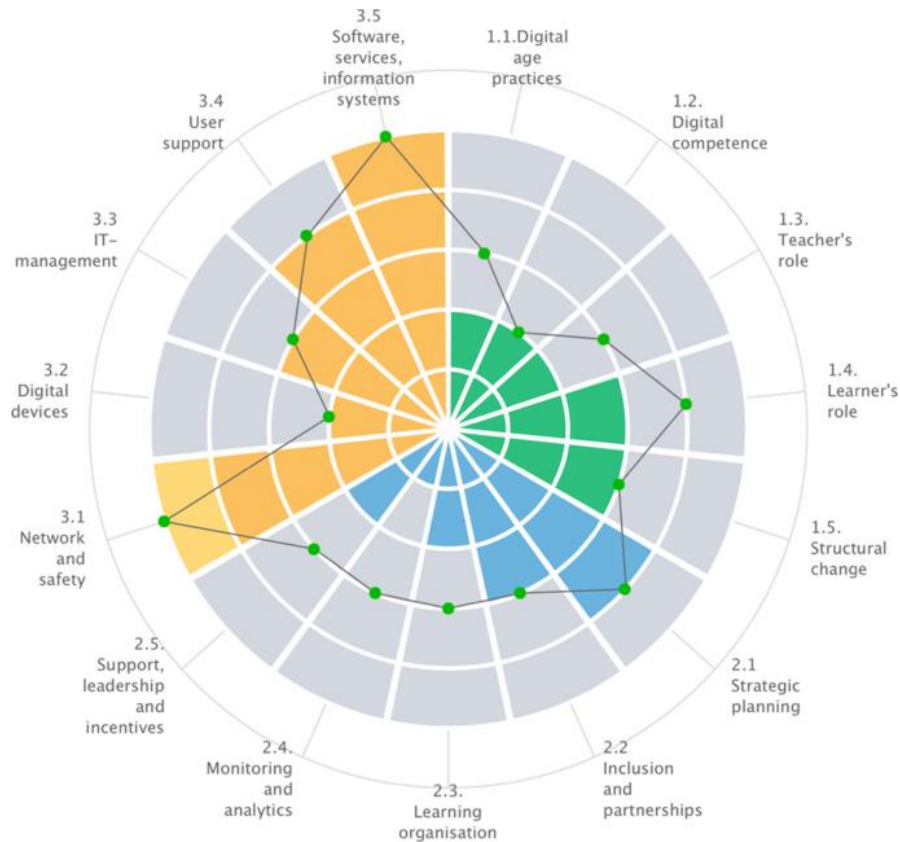
- on the one hand, " a story of digital wizards... capable of producing near-omniscient insights into public behavior,"
- and on the other hand, a "more mundane" but more accurate story of "messy workflows, incomplete datasets, and endless trial and error."

"If the public is so easily duped, then our political elites need not be concerned with satisfying their public obligations. If real power lies with the propagandists, then the traditional institutional checks on corruption can be ignored without consequence."

# Impacts and Incentives

Reasons learning analytics are becoming more widespread Simon (2017):

- Tools create less dependence on LMS analytics (Slade & Prinsloo, 2013)
- Economic pressure to automate education (Taylor, 2001)
- Emphasis on developing students' 21st century skills (Dede, 2010)
- A strong political interest in relation to how 'data' can inform and improve learning



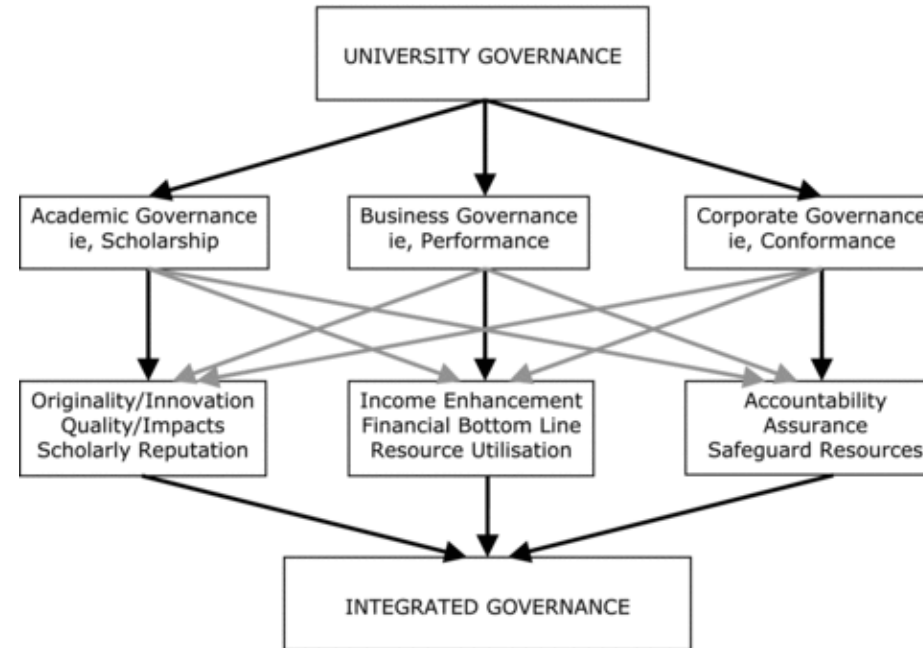
Kilińska and Thomas Ryberg, 2019 <https://journals.aau.dk/index.php/pbl/article/view/2545/2970>

See also: Taylor, J. C. (2001). Automating e-Learning: The Higher Education Revolution

Image: <https://link.springer.com/article/10.1007/s10758-021-09514-5>

# Impact and Governance

“digital policy instruments...  
enabling techniques of  
governing education to be  
operationalized in new ways”



Williamson, B. (2016). Digital education governance: data visualization, predictive analytics, and ‘real-time’ policy instruments. *Journal of Education Policy*, 31 (2), 123–141. <https://doi.org/10.1080/02680939.2015.1035758>

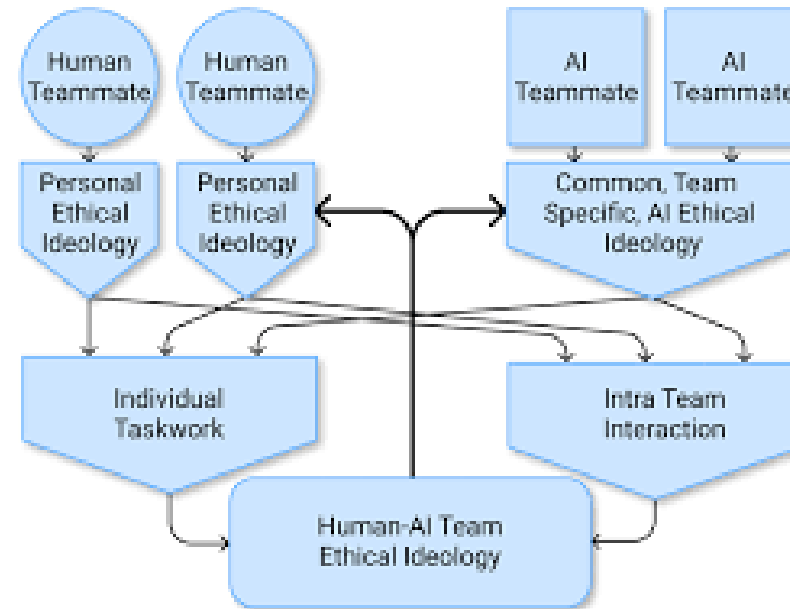
Williamson, B. (2017). *Big data in education: the digital future of learning, policy and practice* (1st ed.). Thousand Oaks, CA: SAGE Publications.

Image: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-8500.2010.00699.x>



# Impact and Ideology

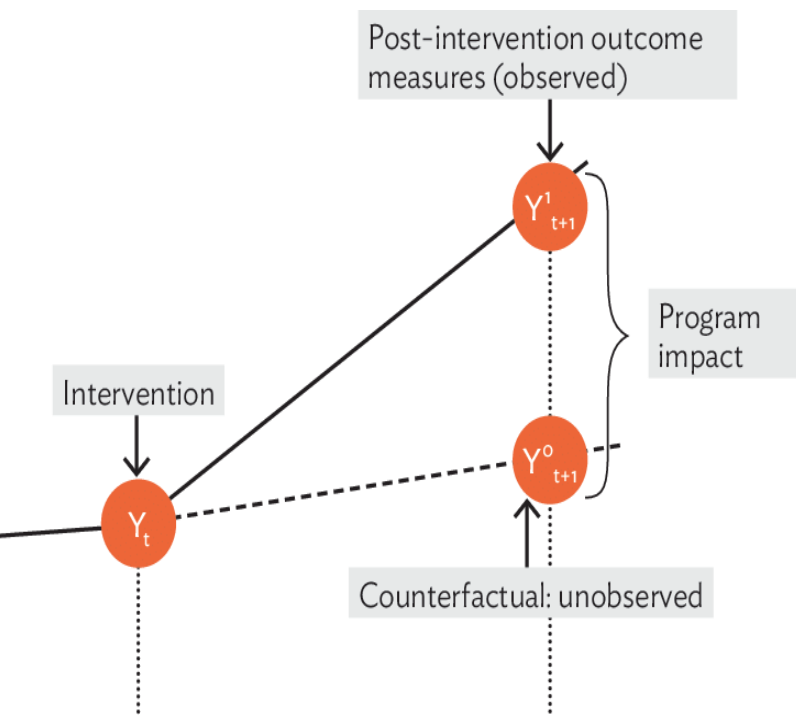
Starting from the perspective that "implicit ideology is an unavoidable feature of pedagogy" we can "sensitise and empower lecturer and learner alike to use the tools of discourse analysis to evaluate the possible ideological content of online courses."



[https://www.aies-conference.com/2021/wp-content/posters/83\\_Modeling%20and%20Guiding%20the%20Creation%20of%20Ethical%20Human-AI%20Teams.pdf](https://www.aies-conference.com/2021/wp-content/posters/83_Modeling%20and%20Guiding%20the%20Creation%20of%20Ethical%20Human-AI%20Teams.pdf)

Iuliia Platonova, Ignatius G.P. Gous , 2019, The online educated or online indoctrinated human? Discourse analysis as a method to study ideologies disseminated by online courses, HTS Theological Studies, 2019/12/27 <https://hts.org.za/index.php/hts/article/view/5342/13193>

# How to Evaluate Impact



“Evaluation can be ineffective and even harmful if naively done ‘by rule’ rather than ‘by thought’”.  
Discussion Points — Learning Analytics by thought:

- Could support creative ways to reflect on the dynamics of the online experience.
- Could lead to definable codes and specific descriptions from indicators
- Could provide a meaningful wellness index (i.e., the general “health” of the forum).
- Could lead to good self-reflection
- Could lead to traceable Communities of Practice

(Dringus, 2012)

# Preparing for the Impact

In the game  
between human  
or bot, where  
every word is parsed  
for curated truth,  
what leaves  
the poet's hand  
might re-assemble  
elsewhere, on demand,  
by algorithm, or design,  
seen by the sleuth  
as bot, or not

-- inspired by the first  
Grapple Session

“How do we teach students about the impact of Artificial Intelligence on our lives with the urgency of NOW, the present, as opposed to some futuristic notion of the Rise of Machines of science fiction?”

Grapple Session: An Inquiry into AI and Ethics by Kevin's Meandering Mind | Author | dogtrax

<https://dogtrax.edublogs.org/2020/01/24/grapple-session-an-inquiry-into-ai-and-ethics/>