Office for Students **OfS**

Artificial intelligence and the regulation of higher education

Purpose

Board's primary role in relation to this paper:

☐ A. Set strategy

☐ B. Set risk appetite

☐ C. Oversee performance

☒ D. Understand context

1. This paper follows comments at the 25 May 2023 board meeting on systemic risks to the English higher education sector, during which the board requested a further discussion on artificial intelligence (AI). This paper continues the trial of ways to engage the board on strategic issues, following the board's effectiveness review.

Recommendations

2. The board is invited to reflect on the following prompts ahead of the board meeting:

    a. Scanning – are there developments in artificial intelligence or its application to education that the OfS should be aware of?

    b. Categorisation – does the paper usefully categorise the different risks and opportunities posed? What other ways might artificial intelligence interact with our work?

    c. Updating our beliefs – what probability would you assign to each risk/opportunity? With what degree of certainty? What information would prompt you to update your beliefs?

3. The board's discussion will be an opportunity to explore the wider context of the OfS's work; the reflections shared will inform the development of future strategy.

Issue

4. There are multiple definitions of artificial intelligence. In this paper we'll use it to mean intelligences created artificially where intelligence is a measure of the capability of an agent 'to achieve goals in a wide range of environments'.[1] The government's white paper on the

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[1] See https://arxiv.org/abs/0712.3329.

regulation of artificial intelligence also emphasises the properties of adaptivity and autonomy in its definition.[2]

5. Recent developments, especially in Large Language Models (LLMs) pre-trained on large textual databases, have generated significant public interest.[3] Notable developments include:

    a. Evidence of artificial intelligences outperforming humans on many higher education level standardised tests.[4]

    b. Evidence of significant productivity improvements in mid-level professional writing tasks.[5]

    c. Significant developments in image generation using artificial intelligence.[6]

6. The government's white paper set out a pro-innovation approach to artificial intelligence. The Prime Minister has since signalled an ambition for the UK to be "not just the intellectual home, but the geographical home of global AI safety regulation".[7]

Discussion of risks and opportunities

7. Most fundamentally, there is an ongoing debate about the existential threat that artificial intelligence may pose to humanity. There are opposing views on how credible this threat is, but even if we assign a small likelihood, the scale of impact would render discussion of other risks moot.[8]

8. If existential risks are mitigated, we can conceptualise the further risks and opportunities posed by artificial intelligence to the regulation of higher education into four categories, listed below.

9. Artificial intelligence and regulatory theory:

    a. Artificial intelligence (and specifically its ability to learn and improve at ever faster rates) poses a conceptual challenge – at some point the rate of change in the technology will be faster than the rate at which regulation can be introduced and applied to that new technology.

    b. It might be that this point is very soon, or perhaps has already happened. How should regulators respond? One approach might argue that principles-based regulation addresses this challenge – principles remain the same while technology changes. This might be the

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[2] See https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach/white-paper.

[3] See https://trends.google.com/trends/explore?date=all&geo=GB&q=AI&hl=en-GB.

[4] See https://openai.com/research/gpt-4.

[5] See https://economics.mit.edu/sites/default/files/inline-files/Noy_Zhang_1.pdf.

[6] See https://arxiv.org/abs/2205.11487.

[7] See https://www.reuters.com/technology/uk-must-seize-opportunities-ai-remain-tech-capital-pm-sunak-2023-06-11/.

[8] See https://www.safe.ai/statement-on-ai-risk?s=03 and https://pmarca.substack.com/p/why-ai-will-save-the-world for examples.

case. But technology may progress faster than regulators or firms/users can apply the principles to a given technological paradigm, at which point the problem resurfaces.[9]

10. Artificial intelligence and regulatory practice:

   a. Introducing new principles, duties or considerations into the work of a regulator will – all else being equal – increase the time it takes for regulatory activity to happen. Combining this observation with the point made in paragraph 9a suggests that attempts to regulate artificial intelligence could bring forward the point at which regulation becomes ineffective, or weaken already struggling systems.

   b. Artificial intelligence may render existing regulatory tools ineffective. We can reasonably speculate that LLMs will soon (or perhaps are already able to) produce documentation required for regulatory assurance. To the extent that regulators use paper-based compliance as a proxy for substantive compliance, the use of artificial intelligence will reduce that proxy's value to nil over time.

11. Artificial intelligence changing the world around education:

   a. Current and future developments in artificial intelligence and related technologies could make significant contributions to economic growth. Predictions vary, but many expect substantive rises in GDP globally and for the UK.[10] There is some debate over the extent to which artificial intelligence will have redistributive effects.[11]

   b. Relatedly, artificial intelligence has the potential to significantly alter labour markets. Firms are announcing headcount reductions over the coming years in part as a result of improvements in the technology.[12] A 2021 report for the Department for Business, Energy and Industrial Strategy argues a broadly neutral effect on employment is the most plausible assumption, noting significant uncertainty on the net effect.[13]

   c. The disruptive effects of artificial intelligence will also be felt in changes to the nature of work. Recent developments have prompted renewed speculation about structural ratios of work to leisure in the working population in the future. More immediately, organisations and individuals are still exploring new use cases for recent advances in the technology. Some

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[9] A related challenge emerges in the case of regulation related to existential risks posed by artificial intelligence, if we a) think there is an existential risk, even if low probability, and b) accept the assumption made by some working on artificial intelligence safety space that artificial intelligence could move from innocuous to existentially dangerous very quickly. Most if not all risk based regulation is predicated on a dynamic system – a repeating game where regulatees learn from and anticipate future actions from other agents. Assumptions (a) and (b) collapse this into a finite stage or one shot game. The optimal regulatory approach in this environment may differ from that in the dynamic systems we typically operate within.

[10] See https://www.goldmansachs.com/intelligence/pages/generative-ai-could-raise-global-gdp-by-7-percent.html and https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html for examples.

[11] See https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/637967/EPRS_BRI(2019)637967_EN.pdf.

[12] See https://www.bbc.co.uk/news/business-65631168, for example.

[13] See https://www.gov.uk/government/publications/the-potential-impact-of-ai-on-uk-employment-and-the-demand-for-skills.

studies suggest disruption may be felt in more strongly in highly skilled or highly paid occupations.[14]

12. Artificial intelligence within higher education:

    a. The recent developments in and public consumption of generative artificial intelligence has prompted concerns about academic misconduct. There are reports of students using these tools to cheat.[15] And a recent study suggests detection tools are ineffective and are biased against non-native English writers.[16]

    b. Educators have been experimenting with artificial intelligence as an educational tool. There are many examples: using it to augment and create new pedagogies, as a teaching assistant or personal tutor, and to reduce burden in other parts of their jobs.[17] Artificial intelligence can improve capacity and capability in educating students.

    c. Higher education will need to prepare students for a word in which artificial intelligence will continue to challenge economic, ethical and social paradigms. Higher education will need to prepare students for an economic environment affected by the factors set out in paragraph 11. They will need to navigate the practicalities of ethical dilemmas that were previously only thought experiments.[18] And they may find themselves in a world where their social landscape is shaped by artificial intelligence, too.

Next steps

13. The rate of change in artificial intelligence is rapid and difficult to predict. Subject to the board's discussion, we believe our current regulatory approach will remain appropriate for at least the next 18 months as technologies continue to improve. Given the pace of change and the possibility of exponential improvements in artificial intelligence, we will keep this under review and will revisit the subject with the board in February 2024.

Paper publication

14. This paper will be published at a future date with other papers from the board meeting.

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[14] See https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4375268.

[15] See https://thetab.com/uk/2023/05/15/first-known-student-caught-using-chatgpt-at-uk-university-heres-how-they-were-exposed-308295 and https://www.theguardian.com/technology/2023/may/18/ai-cheating-teaching-chatgpt-students-college-university for examples.

[16] See https://arxiv.org/abs/2304.02819.

[17] See https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4391243, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4300783, and https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4475995 for examples from one pair of authors.

[18] See https://plato.stanford.edu/entries/ethics-ai/.