British Academy & Skills England Roundtable: Building a roadmap for AI skills policies in the UK

Summary of discussion

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Introduction

On Friday 15th November 2024, the British Academy and Skills England co-hosted a roundtable on the topic of AI skills.

The roundtable focused on the skills policies the UK might pursue in response to the adoption and diffusion of AI technologies across the economy, and on how the UK government might develop a roadmap leading towards the implementation of such policies. Discussion at the event covered three broad topics: (1) Lessons and evidence from historical parallels that also involved changes in technology and the emergence of related skills; (2) Future societal and policy challenges, both existing or emerging; and (3) How to map the implementation of AI, including AI skills and impacts of AI across the UK, and ensure a route towards beneficial AI skills policies.

The event convened officials from Skills England and the Department for Education alongside other government departments, British Academy Fellows and other expert perspectives from the SHAPE (Social Sciences, Humanities and Arts for People and the Economy) disciplines, and other key stakeholders working on skills and AI to contribute to the above discussions.

Skills England, which is currently set up in shadow form within the Department for Education with plans to be fully established in 2025, is a new arms-length body, aimed at addressing national and regional skills needs. It will assess skills gaps, align training with employer demands, collaborate with regional organisations, and ensure skills are prioritised in government decision-making. With this new development in mind, the roundtable was also a valuable opportunity to think about the opportunities for skills strategies to function in symbiosis with other initiatives emerging across the new government (for example, the forthcoming industrial strategy).

This note summarises some of the key themes that emerged from the three parts of the discussion.

Historical Parallels

The first part of the discussion focused on the insights and lessons that might be drawn from looking to historical instances of technological change and related impacts on skills across society. Participants noted the value of considering both successful and unsuccessful past instances of technology adoption and diffusion, to understand what has and has not worked.

Particularly, they highlighted the importance of recognising the social and cultural components of technological change, the role of legislation historically in encouraging collective action towards skills development, and the mechanisms of funding, investment, and infrastructure needed to spur technology adoption.

Main points included:

Technological changes are also social and cultural changes:

AI adoption that focuses on technical development without considering concomitant social and cultural changes may fail to recognise unintended consequences of technological changes; policy must acknowledge the need to govern the societal impacts of such shifts for them to be equitable and beneficial.

- Potential historical parallels suggest a need for caution and acknowledgement of previous issues encountered at times of technological change and rapid growth: namely, environmental degradation and the exacerbation of gender, racial and class inequalities.
- Past assumptions about the nature of technological change have often subsequently been proven incorrect. For example, traditional accounts of the development of cotton textile technology in Britain during the industrial revolution tend to lapse into individualist paradigms, downplaying wider structural factors and the role of culture.
- National skills development entails thinking beyond national borders. For example, Britain's 'first' industrial revolution in the eighteenth century was closely entangled with British consumers' desires to gain access to cotton textiles produced by skilled artisans in India.

Institutional arrangements that support collective action are opportunities to actively encourage skills development:

While central legislation can play an important role in the creation of training and skills development across sectors and localities, collective action has also been shown to be a vital way of spurring the formation of institutional arrangements that contribute to skills development.

- In general and in common with other countries, the UK has historically lacked central legislation to regulate skills formation, although a notable and early exception to this was the 1562 Statute of Artificers, which included regulations on apprenticeships.
- During the industrial revolution, employers played the most prominent role in skills training, with local collective action used to resolve local skills shortages. Employers, using the political leverage and finances they possessed due to their control of business rates, formed civic organisations, including Mechanics Institutes, that provided adult education.
- Taking note of this historical example, collective action from employers and civic organisations can be an effective means to address localised or specific skills needs; institutional arrangements that harness this action may prove more effective than strategies that rely on centralised provision of skills.

Mechanisms of funding, investment, and infrastructure are needed to spur technology adoption.

Adopting new technologies in the education system and integrating them into schools can be a challenge and take considerable time, especially without supporting infrastructure and investment.

- To give an example with older technology, the use of tape recorders by Modern Foreign Language teachers took many years to be widely adopted in schools.
- This is not necessarily due to a lack of enthusiasm from practitioners; often, challenges arise due to lack of funding. In some cases, 'EdTech' can offer potential benefits and generate considerable value; however, investment in physical infrastructure, such as reliable internet connection and appropriate hardware, is a pre-requisite for such interventions to be effective in schools. Likewise, investment in equipping practitioners to use the technology effectively is crucial; without this, technology can add little value and may be significantly underused.
- Even with broadband infrastructure in place, the high costs of introducing AI into schools means underinvestment in tech in schools remains a problem.
- AI technologies can be facilitatory tools to improve education and skills development, but they are not ends themselves. Skills development policies benefit from a practical focus on ensuring that individuals can use technology effectively to meet objectives, whether in education or in the workplace.
- Looking to the historical analogies of the telegraph and the internet, which became essential infrastructure and shaped society, education, and work, could help us to better understand potential trajectories of AI technologies and the skills needed to harness them.
- However, in these previous waves of change, the need to build new infrastructure meant that the speed of implementation was much slower than today. Now, the essential infrastructure for the adoption of most forms of AI (the internet) is relatively widespread.
- In some instances, employees, rather than employers, are leading the adoption of AI. This may be because AI is increasingly integrated into the technologies that individuals already use, such as mobile phones and the internet, at a faster rate than in workplaces, where policies and infrastructure make adoption more complex.
- Nonetheless, inconsistencies in reliable internet coverage and digital skills will likely impede individuals in many areas adopting AI. This has the potential to further increase digital inequalities.

Future challenges

The second part of the discussion turned to the challenges for AI skills policy that exist given societal trends such as demographic changes, the pace of innovation, the need to meet sustainability goals, the need to ensure diversity and equity of access to work, and the coordination of skills strategy across sectors.

Accordingly, participants identified the need for an adaptable and resilient skills system, one that places citizens and civic society at its forefront and recognises the umbrella of skillsets that AI skills encompass.

Main points included:

Building in adaptability and resilience to counter risks of obsolescence and unanticipated changes:

Emphasising the importance of general and transferable skills and enabling continuous, lifelong learning can ensure that the skills system is adaptable even when future technological trajectories are not known.

- Accurate skills forecasting is challenging and does not always appropriately inform long-term skills strategy. For example, it was assumed that coal mining skills in Yorkshire in the early 1970s would be needed in the long-term, but demand suddenly decreased significantly due to labour market changes. Skills forecasting should therefore be approached with rigour and humility, recognising a range of possible known and unknown trajectories that might exist.
- There can be a 'lag' in education: meaning that in periods of rapid technological change, what young people learn in school can become outdated by the time they enter the workforce, and certainly by later in life.
- For example, over the last two decades, initiatives aimed to encourage young people to learn to code; today coding is seen as an area where AI can be successfully applied and may augment some roles. While coding skills may still be valuable, innovative approaches to updating curricula content may help to address these issues.
- Challenges related to obsolescence can be especially pertinent for science, technology, engineering, and mathematics (STEM) graduates, whose embodied technical skills are sometimes specific to technologies that rapidly become outdated.
- Continuous learning, including through the implementation of the Lifelong Learning Entitlement (which must provide qualifications that have credibility in the labour market) can help enable individuals to react to changes in skills needs.
- Alongside lifelong learning, the training of individuals in the assessment and application of new AI technologies in their contexts will help to embed resilience and adaptability to further technological change without formal learning.

Placing citizens and civic society at the forefront of the policy design ecosystem:

Effective models of AI adoption and diffusion will include engaging key civic groups in policy design and development, creating an AI-literate citizenship, and ensuring the benefits of AI are spread across society and help to reduce inequalities.

- If the UK is to be a global leader in AI adoption, it must confront the challenge of ensuring that AI design and development enables society, broadly defined, to equitably enjoy the benefits of AI tools and technologies. Responses must be broad, citizen-centred and societal-facing, acknowledging how these interventions will impact on people across and within sectors.
- For example, the impact of AI on copyright and intellectual property legislation and regulation is an area where AI development is already having disruptive effects that differ across stakeholders; civic society must be involved at the forefront of these discussions around culture and the UK's creative industries, amongst other sectors.
- Disparities in AI literacy will also create obstacles to equitably realising the benefits of AI. As with current data literacy initiatives, policymakers will likewise need to consider what an AI-literate citizenship looks like and how it might be developed.
- There cannot be a 'Whitehall knows best' approach in this area, but rather an engagement model that taps into a wide range of knowledge and experience, including drawing on local and regional knowledge in shaping AI skills strategies.

Treating AI skills as an umbrella of skillsets:

'AI' is a broad term, and, as a result, AI skills encompass a broad set of skills that will change over time, requiring a holistic approach to skills development.

- AI is an umbrella technology: a composition of different types of composite technologies which will be used by different people for different purposes. AI skills are therefore not just one set of skills.
- Generative AI is just one aspect of AI, although perhaps the one that has generated the most public interest. Most organisations do not have access to the computational power to use the most advanced generative AI, and the power of these advanced models is often not needed.
- Instead, AI will most commonly be used in the immediate future for relatively basic tasks, such as detecting potholes in the road (with lower environmental impacts than more advanced models).
- The skillsets required to use AI for these kinds of applications will be in demand and will likely include data and analytical skills.
- Mathematics education may not be currently providing the core computational skills that will be needed for AI literacy, and the mathematics curriculum at A-level, for example, could benefit from being more aligned with applications in professional contexts. Assessments, which themselves drive learning, are often themselves very close-ended in comparison to the open-ended nature of most real-world problems. There is a need to build core computational literacy across subjects in the provision of broad AI skills..
- Data handling and statistical skills could also be further built into curricula to further align skills development with future real-world applications and ensure that data can inform research and analysis with societal benefit (the British Academy has explored this issue previously– for example, see the summary of a workshop series held last year).
- In light of these considerations, the introduction of an 'AI GCSE' is unlikely to be useful. Instead, a more holistic approach to AI skills development, which explores how the skills to interact effectively with AI can be introduced across the curriculum in a variety of subjects, could facilitate a more resilient and flexible skills system.

Building a Roadmap

The final part of the discussion covered the ways in which we can better map the implementation of AI, including AI skills and the impacts of AI across the UK, and how policymakers can use this to develop societally beneficial AI skills policies.

Participants pointed to the value of adopting a diversity of methods to map AI skills, equipping education providers and using incentive structures to generate skills transferability, including in sector-specific contexts, and using AI skills strategies as an opportunity to address inequality and break down divides.

Main points included:

Adopting a diversity of methods and approaches:

Mapping AI will be a complex task that will require an understanding of the difference between AI adoption/augmentation and AI exposure, as well as developing a clear picture of AI at a variety of levels, especially at the task-level.

- There are different ways to map AI and its implications for skills policy. For example, a regression approach focuses on the causal impact of AI adoption, whereas an exposure index approach uses data analysis and detailed task measures to study impact at occupation level. A combination of both will be necessary to map AI adoption and its impacts.
- Finding out AI exposure levels – the likelihood of jobs to be impacted by advances in AI – is not useful alone; analysis of exposure levels also requires a distinction between which tasks will be augmented by AI and which will be automated.
- It would be beneficial to have real-time updates to AI mapping based on tasks; however, there is a scarcity of access to data on what is happening on the ground in the labour market (analysis of job advert data may be one way to shed light in this area). A two-dimensional map of occupations by exposure and automation would be a useful way to track changes and developments on an ongoing basis.
- Training that considers the various functions that AI plays in collaboration with human expertise (whether logic-mathematical, social, verbal-linguistic; processing-speed, or visual-spatial, for instance), may aid understanding of how different types of AI augment human capabilities and could enhance decision-making and task efficiency across industries.

Equipping education providers and using incentive structures to ensure responsiveness and transferability:

Building linkages between education providers and employers and developing the capabilities of both to generate benefits from these connections will be key to a successful AI skills strategy.

- AI skills strategies could create transferability by enabling education providers to be responsive to the evolving needs of employers, so that, in turn, employers are incentivised to appropriately train workers and have the right capabilities to do so.
- Developing managerial capability is also important – if workers' skills are not effectively utilised by managers, then upskilling will have little effect in an organisation.
- Training within firms should be considered alongside external skills provision, particularly amidst a long-term decline in training within firms. Both the supply of skills and enabling firms to change ways of working to increase productivity are vital.
- Incorporating general, transferable skills into curricula will facilitate further skills acquisition and re-skilling later in life. For example, communication skills will be key and will complement AI technologies in various applications.
- In the future, it is likely that individuals will need a combination of technical and cognitive skills alongside communication and 'people' skills.

Using skills policies to break down divides:

An AI skills roadmap should account for wider stakeholders, include underrepresented groups, in its design and implementation and identify ways to address the digital divide in society, as well as existing issues in the education and technology sectors that could prevent the equitable development of AI skills.

- Different methods of delivering AI skills training, such as in shorter bursts, can be more accessible to some groups and help tackle skills gaps.
- The AI technology sector faces diversity issues; women currently make up only 18% of the AI workforce. Disabled people are often excluded from AI development. There is a need to create more opportunities for underrepresented groups, change workplace culture, and reframe the nature of work in the sector to allow for more flexibility.
- Breaking down divides between STEM and SHAPE in education and skills development could also aid the development of general, transferable skills and create a more responsive and resilient workforce (for example, by equipping humanities students with maths skills, or enabling STEM graduates to develop the critical thinking and communication skills associated with SHAPE disciplines).

Understanding sector-specific application, adoption, and diffusion:

AI tools are used and applied in specific contexts. An AI skills roadmap will need to account for the different contexts in which AI is used and applied, identify the specific skills required for its use in these different contexts, while enabling opportunities for skills transferability across sectors where necessary.

- In education, the use of AI can sometimes be discouraged due to concerns about its impact on and use in assessments. While these concerns are important, they do not negate the need to ensure that the next generation can use AI tools effectively.
- Skills England are currently working on a skills taxonomy (the Standard Skills Classification) that aims to help close some of the data gaps on task-based skills. Core skills such as communication, creativity, and others are often regarded as a challenge to measure effectively, partly as they are difficult to credentialise.
- There are important lessons to be drawn from sector-specific applications in terms of skills adaptability: while specific technical skills may erode, there are other underlying skills that remain very useful, including the cognitive gains from high-level learning.
- Successfully adopting and augmenting AI requires the development of good human decision making, including understanding how AI technologies' structure users' choice environments, and ensuring human agency remains paramount.

Looking Forward

Skills England will continue to engage going forward with stakeholders in this area as they look to shape the next phase of AI skills policy development. The British Academy will continue to provide convening support and to highlight the contributions that the SHAPE disciplines can make to discussions around AI skills.

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If you would like further information about this work or would like to engage with us, please contact: digitalsociety@thebritishacademy.ac.uk.

Annex: Readings shared by participants at and after the roundtable

- Ahmadova, Laman; Newman-Griffis, Denis (2024). Understanding Responsible AI Stewardship in the Public Sector. The University of Sheffield. Report.
- Ameen, N., Pagani, M., Pantano, E., Cheah, J.H., Tarba, S. and Xia, S., 2024. The Rise of Human–Machine Collaboration: Managers' Perceptions of Leveraging Artificial Intelligence for Enhanced B2B Service Recovery. British Journal of Management, 36(1), pp. 91-109.
- Computer-Based Math, Required Outcomes from Core Computational Thinking.
- Newman-Griffis, D. R. (2024, September 6). AI Thinking: A framework for rethinking artificial intelligence in practice.
- Selwyn, N., Campbell, L. and Andrejevic, M., 2023. Autoroll: Scripting the emergence of classroom facial recognition technology. Learning, Media and Technology, 48(1), pp.166-179.
- STEM Learning AI Roundtable, What opportunities and challenges does AI present for teachers and how can our education system ensure we have the right skills and knowledge for the future of AI?

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