UNSW Submission – Inquiry into the Digital Transformation of Workplaces

UNSW welcomes the opportunity to provide a submission in response to the Inquiry into the Digital Transformation of Workplaces, adopted by the House Standing Committee on Employment, Education and Training – which focuses on the rapid development and uptake of automated decision-making and machine learning techniques in the workplace.

Executive Summary

The House Standing Committee on Employment, Education and Training should consider the following as part of its Inquiry into the Digital Transformation of Workplaces (Inquiry):

Digital transformation can help boost Australia's productivity

1. Technologies, including artificial intelligence (AI) and machine learning (ML), can help boost productivity growth. The Government should continue to work in concert with industry, research organisations, and the higher education sector to consolidate and concentrate AI and ML research and capabilities to solve complex policy challenges. With a long-term commitment from Government to support and promote research efforts particularly of universities, Australia can become a world leader on the practical applications of AI and ML in the workplace.

Digital transformation in the workplace requires skills development and lifelong learning

2. Universities can help bridge skills gaps, and prepare students to apply digital technologies in the workplace. To support this, UNSW is developing Work Integrated Learning (WIL) opportunities, which help ensure that graduates are job-ready when they join the workforce. The Government can support this work by:
    a. Continuing to play an important role in catalysing relationships between industry and the higher education sector; and
    b. Providing assistance and incentives for industry to participate in work-integrated programs, including supporting efforts to overcome challenges that may cause industry reluctance to participate in these programs.
3. Reskilling and upskilling are becoming increasingly important to accelerate career progression and earnings. UNSW is well-placed to address this, with offerings ranging from Masters degrees through to microcredentials. In this context, the implementation of the National Skills Passport by the Government can help deliver outcomes for individuals by expanding access to recognised prior learning and providing clear pathways to formal

qualifications – enabling individuals to move into jobs faster while increasing offerings and options by education providers.

4. Lifelong learning opportunities need to be widely and equitably accessible, and broadly appreciated as an important step in career development – addressing both supply and demand challenges. The Government, along with industry stakeholders, should play a supporting role in highlighting the importance of lifelong learning and ongoing education to the benefit both of the individual and, also, national productivity over the long term.

Identifying and managing risks

5. The Government should continue to work closely with and consult experts on the risks of digital technologies given the breadth of research being undertaken, including at universities. The Government could leverage expertise to apply multidisciplinary approaches to understanding complex, societal problems; co-design policy solutions; shape standards and regulations; and increase awareness of the biases and limitations of AI and ML in the workplace.
6. We encourage the Government to prioritise research concerning responsible development and use of AI and ML systems and related changes to regulatory frameworks.

About UNSW

UNSW is ranked in the world's top 20 universities. UNSW is a world-leading research and teaching-intensive university, known for innovative, pioneering research and high-quality education with a longstanding global impact. Since our foundation in 1949 and through celebrating our 75th anniversary year, our aim has been to improve and transform all lives through excellence in research, outstanding learning and teaching experiences, and a commitment to advancing Australia's economic growth and prosperity. UNSW works closely with government, defence, industry, and small and medium-sized enterprises to apply digital technology to help solve real-world challenges.

UNSW's Research Institute in artificial intelligence, data science and machine learning, proudly supports the endeavours of more than 300 esteemed UNSW academics across multiple faculties and over 50 distinguished research groups, labs, and centres. Our AI Institute serves as a frontrunner in advancing the field. The key question for us is how we use these advanced technologies to promote positive change for our society, and we see our ability to contribute to this broader objective as increasingly significant.

Digital transformation can help boost Australia's productivity

Significant economic benefits

According to the CSIRO, AI and ML models and tools will "transform economies and the basis of competition globally, by unlocking new societal and environmental value, and accelerating scientific discovery"[1]. The collective decisions we make today will shape how these transformative capabilities will affect productivity and economic growth over the coming decades.

[1] CSIRO Data61 (2019) Artificial intelligence: Solving problems, growing the economy and improving our quality of life: www.csiro.au/-/media/D61/Reports/AI-Roadmap/19-00346_DATA61_REPORT_AI-Roadmap-_7_.pdf

The International Monetary Fund (IMF) highlights that "boosting productivity growth may be the globe's most fundamental economic challenge"[2]. AI and ML techniques could be applied to a substantial share of tasks completed by most workers and substantially boost productivity in those tasks. In this future, AI lives up to its promise of being one of the most radical technological breakthroughs. Moreover, it enables workers to spend more time on non-routine, creative tasks, and a growing share of the labour force increasingly comes to resemble a society of scientists and innovators. The result, the IMF suggests, is an economy operating at a higher level of productivity, with a permanently higher growth rate[3]. Through automation advancements, we could see an increase to productivity growth globally by up to 0.8 to 1.4 per cent annually[4].

We welcome the Inquiry examining the intersection between advanced digital technologies and the labour market. Australian workplaces are changing their operating models, and requiring new skills and tools to effectively leverage AI and ML advancements. The CSIRO has estimated that by 2030, Australian industry will need approximately 161,000 new AI and emerging technology savvy workers[5].

According to Amazon Web Services, hiring AI-skilled talent is a priority for two in three employers in Australia, but 75 per cent are struggling to find the AI talent they need[6]. The higher education sector is helping to develop Australia's workforce with the necessary skills to effectively apply AI and ML technologies.

Science, research and technology development

Universities can help advance national objectives relating to science, research and technology: The CSIRO identified three "high potential areas of AI specialisation for Australia" – health, ageing and disability; natural resources and environment; and cities, towns and infrastructure. UNSW is uniquely placed to contribute its expertise to help shape the policy development of these areas. For example, through the AI Institute, UNSW researchers are using AI and related techniques to deliver positive societal impact – including for autonomous remote monitoring of Australia's coasts; safe mining operations; medical imaging-based diagnostics; epidemiology and hospital safety; and human performance and stress management.

Australia's research and investment competitiveness: Australia has established world-leading capabilities in advanced digital technologies – housed within companies, research organisations and universities. There are untapped opportunities for Australia to consolidate and concentrate our research and capabilities.[7] This is important if Australia is to be a leading digital economy.

Australia produces 1.6 per cent of published research on AI globally[8]. Remarkably, 22 per cent of Australian AI research is in the top 10 per cent of published research[9]. However, there is still a challenge associated with translating research into commercial products. For example, Australia only

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2 International Monetary Fund (2023) The Macroeconomics of Artificial Intelligence: www.imf.org/en/Publications/fandd/issues/2023/12/Macroeconomics-of-artificial-intelligence-Brynjolfsson-Unger

3 Ibid

4 McKinsey & Company (2017) A future that works: Automation, employment, and productivity: www.mckinsey.com/~/media/mckinsey/featured%20insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20future%20that%20works/MGI-A-future-that-works-Executive-summary.ashx

5 CSIRO (2024) 'Addressing Australia's skills shortage in technologies': www.csiro.au/en/work-with-us/funding-programs/funding/next-generation-graduates-programs

6 Amazon Web Services (2024) AI skills could boost salaries and accelerate career growth for workers in Australia: www.aboutamazon.com.au/news/aws/digital-ai-skills-report-australia-2024#:~:text=AI%20skills%20could%20boost%20pay,jump%20by%2029%25%20or%20more.

7 CSIRO Data61 (2019) Artificial intelligence: Solving problems, growing the economy and improving our quality of life: www.csiro.au/-/media/D61/Reports/AI-Roadmap/19-00346_DATA61_REPORT_AI-Roadmap-_7_.pdf

8 CSIRO (2023) Australia's artificial intelligence ecosystem – Catalysing an AI industry: www.csiro.au/-/media/D61/AI-Ecosystem-Catalysing-an-AI-Industry-Report/Aus-AI-Ecosystem-Report-2023.pdf

9 Ibid

contributes to 0.2 per cent of AI patent inventions globally[10]. Australia is competing with other countries that are taking strategic steps to enhance their AI and ML research capabilities, including through greater government investment as seen in Canada, China and Singapore[11].

Research & Development (R&D) commercialisation: Government plays an important role in supporting universities to boost prioritised R&D and drive commercialisation outcomes with industry partners. The Trailblazer Universities Program is one example of how government has supported commercialisation efforts across the higher education sector. We welcome the Government's recent announcement to commission a strategic examination of Australia's R&D system to maximise the contribution of R&D to the broader economy[12].

Universities are part of the innovation ecosystem: Research undertaken at universities has helped to drive the AI and ML advances that laid the groundwork for the commercial boom we are experiencing today[13]. Importantly, academia is producing leaders of pioneering AI companies[14]. Australia needs to ensure that academia remains a strong component of the innovation ecosystem.

Computational power: Large language models, such as ChatGPT, require companies to have vast computational power and extensive data sets[15]. Empowering universities to remain alongside companies at the forefront of AI and ML research will be key to realising the field's long-term potential[16]. For example, in the United States, the National Artificial Intelligence Research Resource pilot will create a shared research infrastructure for AI, which could help academic researchers access graphics processing unit (GPU) computational power more effectively[17].

Data sets: To support the development of Australia's research capabilities, the Government can help develop large, high-quality data sets where possible and appropriate to do so. Government and philanthropic organisations should work with universities and industry to pinpoint seminal challenges in science that would benefit from access to open data sets. For example, we welcome the Government's development of the Digital Atlas of Australia, which connects trusted national data sets in a central online platform[18].

Digital transformation in the workplace requires skills development and lifelong learning

Universities can help bridge skills gaps, and support individuals to apply digital technologies in their job or improve their career prospects. This is particularly important considering that most employers in Australia are expecting to use AI and ML solutions in their workplaces by 2028[19].

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[10] Ibid
[11] Ibid
[12] Australian Government (2024) 'Industry, science and technology powering a Future Made in Australia': www.minister.industry.gov.au/ministers/husic/media-releases/industry-science-and-technology-powering-future-made-australia#:~:text=The%20Government%20will%20commission%20a,and%20maintain%20our%20competitive%20edge.
[13] MIT Technology Review (2024) Three ways the US could help universities compete with tech companies on AI innovation: www.technologyreview.com/2024/04/19/1091488/three-ways-the-us-could-help-universities-compete-with-tech-companies-on-ai-innovation/
[14] Ibid
[15] Ibid
[16] Ibid
[17] United States National Science Foundation (2023) National Artificial Intelligence Research Resource Pilot: https://new.nsf.gov/focus-areas/artificial-intelligence/nairr
[18] Geoscience Australia (2024) Digital Atlas of Australia: www.ga.gov.au/scientific-topics/national-location-information/digital-atlas-of-australia
[19] Amazon Web Services (2024) AI skills could boost salaries and accelerate career growth for workers in Australia: www.aboutamazon.com.au/news/aws/digital-ai-skills-report-australia-2024#:~:text=AI%20skills%20could%20boost%20pay,jump%20by%2029%25%20or%20more.

Digital literacy and work-integrated experiences

Digital literacy equips individuals with the appropriate knowledge and skillset to use digital technology tools and resources responsibly and ethically. Universities are helping to prepare Australia's graduate students for using AI and ML tools in their jobs in a productive manner, detecting the use of AI for harmful intent, and being able to critically evaluate AI and ML-generated output. By 2028, 86 per cent of workers in Australia anticipate incorporating AI into their daily work, with 25 per cent planning to use AI "extensively"[20].

UNSW is continuing to build connections and promoting AI and ML in teaching across the university, including through WIL opportunities. WIL opportunities enable students to work directly with industry and community partners for credit towards their degree. There are many benefits to this approach – for example, students can observe how a variety of new technologies are being utilised in the workforce. With a learning mindset, students can then apply these new technologies in an innovative way, which can help trigger new insights for industry.

The Government can support this work by incentivising industry to participate in WIL, and support efforts to overcome challenges that may cause industry reluctance to participate in WIL initiatives and programs. Government plays a valued role in facilitating collaboration between industry and the higher education sector, including through initiatives that help students build job-ready skills such as the CSIRO's Next Generation Graduates Scholarship Program. This program has been established with universities and industry co-funding scholarships for honours and doctorate programs, enabling students to participate in industry-led placements. These industry experiences allow students to develop their digital transformation skills before joining the workforce.

To complement this, the Government should support greater participation of industry in research. Shared academia-industry roles are common overseas but are rarely seen in Australia. Supporting the establishment of such positions could yield closer linkages, as would nurturing programs that make it easier for academics to move back and forth between academia, industry and/or public service roles without adversely impacting their career.

Career transitions – reskilling and upskilling

According to the World Economic Forum, AI could displace up to 75 million jobs and create 133 million new jobs, leading to a net increase of around 58 million new jobs in the global economy[21]. This is creating a career retraining and upskilling imperative. It is estimated that Australian workers will, on average, need to increase time spent learning new skills by 33 per cent over their lifetime[22].

Advanced digital technologies are shifting the workforce skills-demand profile. Findings from Microsoft shows that 82 per cent of leaders believe their employees need to be prepared for the growth of AI[23]. However, 60 per cent admit to not having the right capabilities for employees to fulfil their role to the best of their ability.

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[20] Ibid

[21] World Economic Forum (2018) Machines will do more tasks than humans by 2025 but robot revolution will still create 58 million net new jobs in next five years: www.weforum.org/press/2018/09/machines-will-do-more-tasks-than-humans-by-2025-but-robot-revolution-will-still-create-58-million-net-new-jobs-in-next-five-years/

[22] CSIRO Data61 (2019) Artificial intelligence: Solving problems, growing the economy and improving our quality of life: www.csiro.au/-/media/D61/Reports/AI-Roadmap/19-00346_DATA61_REPORT_AI-Roadmap-_7_.pdf

[23] Microsoft (2023) Introducing Skills in Microsoft Viva, a new AI-powered service to grow and manage talent: www.microsoft.com/en-us/microsoft-365/blog/2023/10/10/introducing-skills-in-microsoft-viva-a-new-ai-powered-service-to-grow-and-manage-talent/#:~:text=In%20fact%2C%2082%20percent%20of,to%20get%20their%20work%20done.

Upskilling and reskilling are becoming increasingly important to accelerate career growth and earnings. Employers in Australia estimate that workers who acquire AI and ML expertise could see their salary jump by 29 per cent or more[24].

UNSW is well-placed to help address the need to upskill and reskill workers, with offerings ranging from Masters degrees through to microcredentials, that take a different approach to education altogether, including integrating vocational education or curriculum co-design with employers. Microcredentials for example can support early and strategic career transitions for workers whose jobs are likely to be positively or negatively impacted by digital transformation. Some of the new skills needed will be of a technical nature. However, as AI and ML uptake increases, there will be considerable emphasis on soft skills such as communication, judgement, and reasoning.

In this context, the implementation of the National Skills Passport by the Government can help deliver outcomes for individuals by expanding access to recognised prior learning and providing clear pathways to formal qualifications – enabling individuals to move into jobs faster while increasing offerings and options by education providers.

Lifelong learning opportunities need to be widely and equitably accessible, and broadly appreciated as an important step in career development – addressing both supply and demand challenges. UNSW has recently appointed its inaugural Dean of Lifelong Learning in response to the increasing demand in Australia for ongoing skills and capability development in the workforce[25]. The Government, along with other stakeholders, should play a supporting role in highlighting the significance of equitable, ongoing education after the completion of a vocational or tertiary qualification, to the benefit both of the individual and, also, national productivity over the long term.

Identifying and managing risks

The introduction of automated decision-making and machine learning in the workplace presents both opportunities and risks. AI is a powerful tool that can enable humans to accomplish more with less. However, even humans with entirely good intentions can still prompt AI and ML methodologies and tools to produce undesirable outcomes[26]. Universities can help identify and educate on key risks while also co-designing solutions to accelerate the benefits for society[27].

Contributing to public dialogue on digital transformation

Experts can, where appropriate, play a role in coordinating activities to shape standards and regulations. This can support greater understanding of the technological principles upon which AI and ML works, and how its impact might be steered for the common good.

[24] Amazon Web Services (2024) AI skills could boost salaries and accelerate career growth for workers in Australia: www.aboutamazon.com.au/news/aws/digital-ai-skills-report-australia-2024#:~:text=AI%20skills%20could%20boost%20pay,jump%20by%2029%25%20or%20more.

[25] UNSW (2024) UNSW Sydney appoints Nick Wailes as inaugural Dean of Lifelong Learning: www.unsw.edu.au/newsroom/news/2024/06/UNSW-appoints-Nick-Wailes-inaugural-Dean-of-Lifelong-Learning

[26] Government Technology (2023) 'Opinion: AI Will Change How Universities Do Scientific Research': www.govtech.com/education/higher-ed/opinion-ai-will-change-how-universities-do-scientific-research

[27] Times Higher Education (2023) Universities, AI and the common good: www.timeshighereducation.com/campus/universities-ai-and-common-good

Providing a unique interdisciplinary approach

Many of the challenges facing our society require multidisciplinary solutions. Incorporating new approaches and perspectives can help dissect increasingly complex, large and interlinked data sets, and to ensure that these approaches are interpretable, scalable and ethical[28].

One of the unique value propositions that universities can offer is an interdisciplinary approach to identifying and addressing risks. This approach can also accelerate the application of technologies that may have not been thought possible. For example, through AI, UNSW Canberra is helping to improve the tracking of space debris and developing capabilities for managing satellite constellations.

Helping to co-design policy solutions

UNSW is proud to collaborate with Government on initiatives that help to enhance understanding of emerging and disruptive technologies. For example, the CSIRO and United States National Science Foundation research program jointly funds bilateral research collaborations that have the potential to deliver transformative findings in the areas of responsible and equitable AI. Through this funding, UNSW's AI Institute is developing AI-powered approaches that enable responsible, fair and equitable solutions for drought, infectious disease, and environmentally harmful emissions[29].

Identifying and addressing biases and limitations

As AI and ML-powered technologies are becoming more accessible, concerns around ethics and limitations are increasing. A study by Gartner found that "85 per cent of AI projects will deliver erroneous outcomes due to bias in data, algorithms, or the teams responsible for managing them"[30].

As an early adopter, UNSW supports the ethical and responsible use of AI in research, learning, teaching, administration, and thought leadership. UNSW's *Ethical and Responsible Use of Artificial Intelligence* guide assists the University in the development and deployment of AI[31]. The principles are aspirational, outcomes-focused, and seek to effectively balance regulation with innovation:

- The use of AI systems at UNSW benefits UNSW, individuals, society, and the environment.
- The use of AI systems is equitable, and respectful of human rights, diversity, inclusivity, and accessibility.
- AI systems and their lifecycle are trustworthy and are used responsibly, safely, and reliably in accordance with their intended purpose.
- The use of AI systems is transparent, and people understand when the AI system is engaging with or impacting them, the environment, and/or society.
- AI systems and their lifecycle used are identifiable, explainable, interpretable, accountable, and contestable.
- AI systems and their lifecycle used are secure and resilient.

UNSW has also recently launched its *Educational Technology Roadmap 2024-2028*, which synthesises the University's aspirations for our ideal future digital learning ecosystem.

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[28] CSIRO (2023) Machine learning and artificial intelligence: https://research.csiro.au/mlai-fsp/
[29] UNSW (2023) UNSW academics awarded more than $1.6m for joint Australia-US artificial intelligence research: www.unsw.edu.au/newsroom/news/2023/02/unsw-academics-awarded-more-than--1-6m-for-joint-australian-us-a
[30] Gartner (2018) 'Gartner says nearly half of CIOs are planning to deploy artificial intelligence: www.gartner.com/en/newsroom/press-releases/2018-02-13-gartner-says-nearly-half-of-cios-are-planning-to-deploy-artificial-intelligence
[31] UNSW (2024) Ethical and responsible use of artificial intelligence at UNSW: www.student.unsw.edu.au/notices/2024/05/ethical-and-responsible-use-artificial-intelligence-unsw

Impact of global regulations

With the support of universities, research organisations and industry, we encourage the Government to closely monitor global regulatory developments, including the potential implications for Australian workplaces. In this context, the Government can prioritise research concerning responsible development and use of AI and ML systems and related changes to regulatory frameworks.

Conclusion

Thank you once again for the opportunity to contribute to this Inquiry. Advanced digital technologies have the potential to impact every sector of the economy. The ability of governments around the world to harness AI and ML capabilities will be a deciding factor for securing economic prosperity in the future and creating long-term value for our society.

Should you wish to discuss any issue raised in this submission, please do not hesitate to contact our Senior Government Relations Manager, Ms Cassandra Switaj, on 02 9348 2246 or c.switaj@unsw.edu.au.