SUBMISSION

Submission to the Treasury

Submission to the Employment White Paper consultation

5 December 2022

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Australian Academy of Technological Sciences & Engineering

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

ATSE welcomes the opportunity to respond to provide a submission to the Treasury on the Employment White Paper. The Employment White Paper provides an avenue to outline emerging challenges and opportunities concerning the future of work, and the role of governments in creating policy settings conducive to achieving full employment and productivity growth. This submission engages with the themes of the future of work for the decarbonisation of the economy and digitalisation, and a more inclusive workforce. ATSE makes the following recommendations for inclusion in the Employment White Paper:

Recommendation 1: That the Employment White Paper recommends the development of a national skills taxonomy.

Recommendation 2: That the Employment White Paper maps a strategy to attract young people and career-changers to priority STEM careers, including supporting the delivery and coordination of internship programs.

Recommendation 3: That the Employment White Paper includes a plan for incentivising lifelong learning for the workforce, including fee relief and tax incentives for businesses.

Recommendation 4: That the Employment White Paper includes a long-term strategy to recruit and retain in-field STEM teachers.

Recommendation 5: That the Employment White Paper includes targeted strategies for improving workforce participation of under-represented groups in STEM, including women and Aboriginal and Torres Strait Islander people.

Understanding STEM (science, technology, engineering and mathematics) skills shortages in key growth areas

Digital transformation of the economy (fast-tracked by the Covid-19 pandemic) has increased demand for digitally skilled and literate workers. Digital transformation will have implications not just for the digitally skilled workforce, but for the activities and consequent productivity gains for all businesses and consumers. The Federal Government has committed to grow the tech industry, with 1.2 million tech jobs by 2030. This will require acting on the Tech Council's recommendations to streamline skilled migration and pathways to permanent residency, developing apprenticeship programs, defining skills standards, undertaking workforce planning, and improving women's participation in tech jobs (Tech Council of Australia 2022). There is a need to also attract and retain highly skilled digital and data workers into public service roles to support the Federal Government's Digital Economy Strategy, which aims for all government services to be available online by 2030 (Department of Prime Minister and Cabinet 2021). As digitalisation increases demand for these workers – estimated by the Strategy as 250,000 new jobs by 2023 – governments will be increasingly competing with the private sector for talent.

The Federal Government's commitment to rapidly reducing greenhouse gas emissions will require a highly skilled workforce. This includes a demand for engineers for the transition to renewable energy and to develop new processes and technologies to target high-emitting sectors. There will also be an increased demand for engineers and other STEM professionals due to growing industries such as quantum, space, and onshore vaccine manufacturing. Australia's ability to meet the net zero target and capitalise on priority industries is contingent on the supply of highly trained STEM professionals.

Jobs and Skills Australia's planned capacity study on Australia's clean energy workforce, as recently announced in a joint statement by federal, state, and territory skills ministers, will provide analysis on skills gaps, workforce supply and demand, and forecasting workforce requirements (Ministers of the Employment and Workplace Relations Portfolio 2022). This will provide an important foundation for understanding the scope of workforce needs for the net zero transition. The capacity study must consider the breadth of professions (including within engineering) required for designing, building, operating, and maintaining new energy infrastructure.

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For employment policies to be successfully implemented, the Federal Government must also ensure supporting infrastructure is in place for their vision of the future workforce. For a digitally skilled and net-zero workforce this would include internet and renewable energy infrastructure, especially into regional Australia. Fast, reliable and accessible internet throughout Australia is also required for customers of digital services, including for work-from-home work which enhances workforce participation including in regional areas.

Developing a common language for skills

For Australia to have a clear vision of the future of work there needs to be a shared language around skills in order to effectively use the existing skilled workforce and ensure training is targeted to areas of demand, and long-term needs. As recommended by the 2022 ATSE report *Our STEM Skilled Future: An Education Roadmap for an Innovative Workforce*, the establishment of a national skills taxonomy would facilitate a shared language around skills, enabling understanding of supply and demand, pathways, and adjacent job families. The development of a national skills taxonomy could be built into the functions of Jobs and Skills Australia. This framework would enable individuals and employers to articulate the skills they have and need, and support individuals to seek career transitions, and will also be invaluable to support the growth and alignment of the micro-credentials market. The taxonomy should be across all skill areas, with digital skills being a priority area or proof-of-concept.

Recommendation 1: That the Employment White Paper recommends the development of a national skills taxonomy.

Retaining and attracting skilled STEM workers

To increase the STEM workforce, three key policy levers are available: local recruitment, retention, and migration. Addressing the skilled migration backlog is an important short-term mechanism to alleviate skills shortages. For long-term planning for STEM-skilled jobs, the Government must design interventions to recruit, train, and retain Australians into these careers.

Paid internships and traineeships are key to develop the future workforce in the medium term especially in areas of skills shortages such as teaching. As recommended by ATSE's *Our STEM Skilled Future* report, quality paid STEM and STEM teaching internship programs should be supported by federal, state, and territory governments to raise the profile of STEM careers. Paid internships can support mid-career workers looking to re-train or change fields to understand the options available to them and how their technical and human skills can translate to different settings. Mentorship also plays an important role for businesses to find and train talent.

Teacher shortages in STEM contribute to school students' engagement, enrolment, and achievement in STEM, with significant flow-on effects to STEM careers and workforce. In mathematics – foundational for many STEM tertiary courses and careers – 38% of mathematics teachers nationally are out-of-field (Weldon, 2016), and 45% of secondary school principals report that maths and science classes at their school are being taught by out-of-field teachers (Wienk, 2020). Teaching 'out-of-field' should be minimised, with long-term planning to boost the supply for qualified STEM teachers. The Employment White Paper must consider how to increase the supply of STEM teachers with in-discipline degrees, including to regional, rural, and remote schools. It is clear that radical change is needed. Strategies such as financial incentives for in-field STEM teachers in fields of urgent demand must be considered as part of this strategy.

A culture of lifelong learning must be cultivated and leveraged to recruit and retain STEM-skilled workers. Ensuring Australia is equipped with the skilled workforce it needs and targeting full employment will require ongoing efforts. Capacity and institutions are required that are nimble and strategic to continuously re-skill the workforce for the emerging and future gaps. It is critical to invest in education and training providers, as well as incentivise businesses to upskill their workers.

Recommendation 2: That the Employment White Paper maps a strategy to attract young people and career-changers to priority STEM careers, including supporting the delivery and coordination of internship programs.

Recommendation 3: That the Employment White Paper includes a plan for incentivising lifelong learning for the workforce, including fee relief and tax incentives for businesses.

Recommendation 4: That the Employment White Paper includes a long-term strategy to recruit and retain in-field STEM teachers.

Strengthening diversity in STEM

Strategies to increase diverse participation in the workforce are a key consideration for the Employment White Paper. Such strategies are critical for reaching full employment and achieving the scale of skilled workers needed for the transformation to the net zero economy. This work is also affected by policy changes in other portfolios (such as childcare) offering extra opportunities to assist in the recruitment and retention of those who are seeking to return to the workforce or undertake part-time work due to parenting or caring responsibilities.

The Jobs and Skills Summit highlighted the importance of equal opportunities, with representatives discussing systemic barriers to employment for Aboriginal and Torres Strait Islander people, people with disabilities, people with caring responsibilities, and women. These barriers are particularly pronounced in the STEM workforce, which has historically excluded these groups. Women comprise only 27% of the STEM workforce, yet there is already capacity to increase this as only 29% of STEM-qualified women go into STEM occupations (Department of Industry, Science and Resources, 2022). Only 0.5% of Aboriginal and Torres Strait Islander people have a university STEM qualification (as compared to 5% of the rest of the population) and they experience higher rates of unemployment than non-Aboriginal and Torres Strait Islander people with STEM qualifications (Office of the Chief Scientist, 2020).

Targeted initiatives for increasing the diversity of the STEM workforce are critical not only for increasing the size of the STEM workforce to mitigate skills shortages, but also to strengthen the outputs of the STEM workforce. Having diverse thought and experience is crucial to improving outcomes, particularly in emerging areas such as Artificial Intelligence in which the issue of embedded bias is well-documented (Zou & Schiebinger, 2018). Boosting the diversity of the STEM-skilled workforce will be critical to the success of the economy's digital transformation.

Specifically curated strategies are required for attraction, retention, and career progression of under-represented groups in STEM. This requires programs from the earliest levels of education to tertiary qualifications to support for workers and employers. This could include the expansion of initiatives such as ATSE's Diversity and Inclusion Toolkit, which supports internal policy development for STEM-focused small and medium sized enterprises, and ATSE's Elevate program, which provides financial support and fosters collaboration and leadership enrichment for women in STEM.

Recommendation 5: That the Employment White Paper includes targeted strategies for improving workforce participation of under-represented groups in STEM, including women and Aboriginal and Torres Strait Islander people.

References

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