Proc. 3rd International Conference on Advancements in Engineering Education (iCAEED2024)
20-23 Nov 2024, Sydney, Australia
ISBN: 978-1-7636843-3-1

Lifelong Learning and Microcredential Courses for the Australian Construction Industry

Swapan Saha
Western Sydney University, Australia

Mike Kagioglou
De Montfort University, UK

Abstract

The rapid development of technology, particularly due to the impact of COVID-19, has greatly enhanced the capability of digital skills to rapidly upskill and reskill the workforce through micro-credentials in the construction industry. The construction industry is a cornerstone of the Australian economy, employing over one million individuals and generating over $162 billion annually, accounting for 10% of GDP. In New South Wales (NSW), this sector is particularly vital, employing nearly one in ten workers and contributing approximately $100 billion in 2018. The NSW Government's $123 billion investment in public infrastructure from 2024 to 2025 highlights the sector's importance, focusing on transport, energy, health, and education. Western Sydney, the fastest-growing and most diverse region in NSW, exemplifies this potential with over 2.65 million residents and key projects like the $1.1 billion Rouse Hill Hospital, $3.5 billion in school investments, and the $7.9 billion Sydney Metro – Western Sydney Airport. Recognising the need for skilled workers, the NSW government invested $200 million in 2021 to establish the Institute of Applied Technology (IAT). This paper examines the skills gap and development in construction, the integration of theory and practice through collaboration among academia, further education, and industry, the University Accord report's vision for higher education, addressing future student and industry needs, and the importance of lifelong learning, with a case study on the IAT Construction. IATC aims to provide market-leading training programs in key signature disciplines in construction that the construction industry needs to address the current and future skill shortages.

Keywords: Upskill, construction industry, public infrastructure

INTRODUCTION

The construction industry is not only a crucial contributor but also the backbone of the Australian economy, employing over one million people across various sectors. Annually, the Australian Building and Construction industry completes over $162 billion worth of work, accounting for about 10% of GDP, making it the fifth-largest sector in the economy (International Trade Administration, 2024). This economic impact is even more pronounced in New South Wales (NSW), where the construction sector drives economic activity. As of August 2021, nearly one in ten people in the NSW workforce were employed in construction, equating to 356,000 individuals statewide. In 2018, gross capital formation (GCF), which measures investment in dwelling and infrastructure construction, generated approximately $100 billion in economic activity (Back to Basics, 2022). This substantial contribution underscores the economic impact of the construction industry in NSW and the significance of ongoing investments from the NSW Government, the Australian Government, and private sector partners. These investments position NSW for unprecedented levels of infrastructure development, further bolstering the state's economic growth.

The NSW Government has earmarked a substantial $123 billion for construction-related public infrastructure projects over the four years to 2024-25. Major areas of expenditure include transport,

energy, health, and education, with transport alone projected to account for 58% of construction-related spending during this period. Energy, health, and education are expected to account for an additional 14%, 7%, and 8%, respectively. These strategic investments, particularly significant for Western Sydney, the fastest-growing and most diverse region in New South Wales, have the potential to impact the construction industry significantly. The deputy premier minister for education and early learning, minister for Western Sydney, and minister for skills, TAFE, and tertiary education outlined a comprehensive plan for Western Sydney in the NSW 2023-24 budget paper (NSW Government, 2024). Western Sydney is home to over 2.65 million residents across 13 Local Government Areas, representing 32.5% of the state's population. The region comprises more than 454,000 households with children and 987,000 (37.9%) people speak a language other than English at home, making it a vibrant and dynamic area with significant economic potential. To capitalise on this potential, several current and future infrastructure projects are underway in Western Sydney. These include a $1.1 billion Rouse Hill Hospital, $3.5 billion invested in Western Sydney schools, the Sydney Metro City and Southwest project, $374.1 million to complete Stage 1 of the Parramatta Light Rail, and $200 million to expedite planning for Parramatta Light Rail Stage 2. Additionally, there is a $7.9 billion collaboration with the Australian Government for the Sydney Metro – Western Sydney Airport, a $2.2 billion Housing Infrastructure Plan, and the development of the Powerhouse Museum at Parramatta (NSW government, 2024).

The swift advancement of technology in the construction field, especially influenced by COVID-19, has significantly improved the ability to quickly upskill and reskill the workforce through digital skills and microcredentials (DESE, 2021). Recognising the importance of lifelong learning and microcredential courses in construction, the NSW government invested $200 million and established the Institute of Applied Technology (IAT) in 2021 to address skill shortages. This initiative is crucial in ensuring that the workforce is equipped to meet the demands of these extensive infrastructure projects. This paper will provide an update on the following areas: skills gap and development in construction; integration of theory and practice through collaboration between academia, further education, and industry; the University Accord report on shaping the future of the Australian higher education sector; addressing student and industry needs and demands for the future; lifelong learning and partnership development; and a case study on the IATC project.

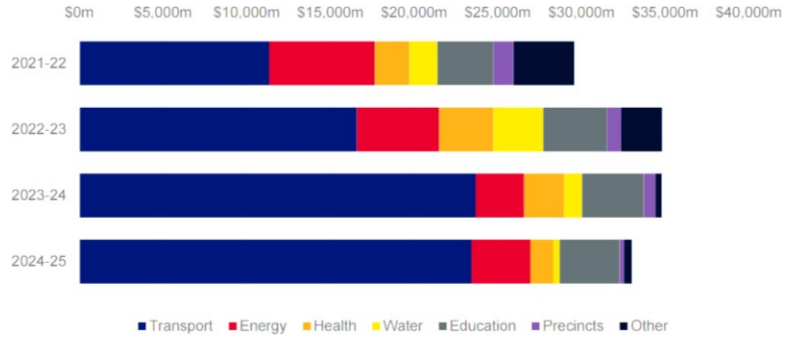

Figure 1. Projected construction-related public infrastructure spent in NSW in different financial years (Valorem, 2021)

CONCLUSION

In conclusion, the COVID-19 pandemic has accelerated technological changes in the construction industry in Australia. The industry faces challenges in adopting digital technologies and upskilling the workforce. Initiatives such as the Institute of Applied Technology (IATC) are addressing these challenges by offering tailored micro- credentials in contract management, work health and safety, project management, digital skills, and sustainability. These programs support workforce upskilling and lifelong learning, ensuring a skilled workforce for the future of the construction sector.

REFERENCES

Back to Basic. (2022). The Australian Construction Industry: Facts and Stats for 2022. Retrieved 5 th July 2024, from https://backtobasics.edu.au/news/the-australian-construction-industry-facts-and-stats-for-2022

De Rosa, M., Glumac, O., Bianco, V., & Pallonetto, F. (2024). A micro-credential approach for life-long learning in the urban renewable energy sector. *Renewable Energy*, *228*, 120660.

DESE. (2021). *National Microcredentials Framework*

Department of Education. (2024). *Australian Universities Accord Final Report Document*. Retrieved from https://www.education.gov.au/australian-universities-accord/resources/final-report

Ellis, L. E., Nunn, S. G., & Avella, J. T. (2016). Digital badges and micro-credentials: Historical overview, motivational aspects, issues, and challenges. *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies*, 3-21.

Fitzgerald, R., & Huijser, H. (2021). Exploring industry-university partnerships in the creation of short courses and micro-credentials. *Back to the Future-ASCILITE'21: Proceedings ASCILITE 2021*, 340-344.

Hickey, D. T. (2017). How open e-credentials will transform higher education. *The Chronicle of Higher Education*, *18*.

Hurley, P., Ta, B., & Knight, E. (2021). Industry experiences and their role in education to work transitions. In: Australian Government.

IATC. (2024). *Institute of Applied Technology (IAT) Construction*. Retrieved 5th of July 2024 from https://www.iat.nsw.edu.au/iat-construction

International Trade Organisation. (2024). Building & Construction. Retrieved 5the July 2024, from https://www.trade.gov/country-commercial-guides/australia-building-construction

Job and Skills Australia. (2023a). *2023 Skills Priority List*. 2023 Retrieved from https://www.jobsandskills.gov.au/sites/default/files/2023-10/2023%20SPL%20Key%20Findings%20Report.pdf

Job and Skills Australia. (2023b). *Employment Projections*. Canberra Retrieved from https://www.jobsandskills.gov.au/data/employment-projections#downloads

NSW Government. (2024). *NSW budget 2023-2024*. Australia: Westren sydney Retrieved from https://www.budget.nsw.gov.au/system/files/budget-2023-09/2023-24_Our%20Plan%20for%20Western%20Sydney__Accessible.pdf

Valorem. (2021). *Construction Strategic Skill Shortage Identification Final report*. Institute of Applied Technology

Wilson, H., & Hay, M. (2018). Using microcredentials to enable the use of the NZDE (Civil) to provide more flexible and focused response to industry requirements.