committee for economic development of australia

# LEARNING **CURVE:** WHY **AUSTRALIA** NEEDS A **TRAINING** BOOST

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# ABOUT THIS PUBLICATION

Learning curve: Why Australia needs a training boost (2024)



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*Learning curve: Why Australia needs a training boost* continues CEDA's work exploring how to ensure Australia has a dynamic labour market that can meet the nation's skills needs and ensure everyone who wants a job can find one. This report identifies the benefits of work-related training to workers and employers and considers why this kind of training is declining in Australia, despite being associated with higher incomes and increased productivity. This is an area that has been under-studied relative to its economic importance.

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# Learning curve:

## Why Australia needs a training boost

**In a time of weak productivity growth, high skills mismatch and low job mobility, it is essential that businesses fully utilise work-related training to improve workers' productivity and career trajectories.**

The proportion of people undertaking work-related training has dropped since 2007, declining by **14%**

...and the average number of hours spent in training for those who participated has fallen by **17%**

### Improving work-related training would benefit...

**WORKERS**

Our analysis shows training participants had about a **20%** pay increase the next year.

**EMPLOYERS**

CEDA found training participants were less likely to move jobs and reported higher satisfaction levels.

**THE ECONOMY**

Increasing work-related training could also help lift Australia's weak productivity growth.

**Employers and employees combined invest more than $12 billion in training annually. To maximise the benefit from this investment, firms should;**

- **Build a learning culture;**
- **Measure success; and**
- **Better target compliance training.**

# CONTENTS

# EXECUTIVE SUMMARY

One-third of Australian occupations face worker shortages. These shortages are increasingly concentrated in jobs driven by global megatrends such as digital transformation, artificial intelligence (AI), an ageing workforce and the energy transition.

To help fill these gaps and confront these challenges and opportunities we need to ramp up work-related training.

This is structured learning such as short courses or online modules to help people become more effective in their jobs. It can be voluntary or mandatory and can range from help to get started in a job, to senior leadership training. It can be delivered directly by employers, by consultants, or in collaboration with educational institutions. It also includes compliance training that ensures employees comply with relevant laws, regulations and internal policies. It requires both employers and employees to commit to learning and create the time to complete it.

This is an area that has been under-studied relative to its economic importance. Employers and employees combined invest more than $12 billion in training annually. Increasing work-related training could also help lift Australia's weak productivity growth.

New analysis in this report, using HILDA data that tracks outcomes for the same individuals over more than two decades, shows that participation in work-related training is associated with considerably higher incomes for employees.

Compared with otherwise similar people who do not participate in training, incomes increase by an average of about

**20%**

in the year after starting training.

Compared with otherwise similar people who do not participate in training, incomes increase by an average of about 20 per cent in the year after starting training. Training cannot just be a one-off, however, as this effect fades over time.

There are benefits for firms who provide training, too, as participating workers will on average be more productive, more satisfied at work and less likely to move jobs.

Despite these favourable outcomes, we find that the rate of participation in work-related training has declined by 14 per cent since 2007, with Australian Bureau of Statistics (ABS) data showing a similar decline from 2013. For those participating, average hours spent in training have also declined. Participation has declined in 17 of 19 industries, with only arts and recreation and wholesale trade groups recording small increases.

The strong income growth for those who do training, payoffs for firms and the increasing need to upgrade skills make declining participation in training something of a puzzle, particularly as available data suggest it has increased in most other developed countries over the past decade.

Participation in formal education in Australia has increased over this time, which on balance should also increase work-related training, as more educated people are more likely to participate in training. Changes in the structure of the economy have favoured industries with high rates of training, such as health and education, which also should have boosted overall training participation.

One explanation is the increasing challenge of creating enough time. More than three-quarters of the 27 respondents to a questionnaire of CEDA members indicated that time and workload were a key barrier to delivery and take-up of training, a result that also came through strongly in consultations with CEDA members across a variety of industries.

An increasingly dynamic economy can create near-term pressures to work harder on immediate priorities, reflected in greater working hours among professionals in the past decade.

But as CEDA's previous work on dynamic management capabilities has shown, organisations need to make forward-looking decisions to adapt to new realities. Firms that actively nurture a culture that values and encourages learning (a learning culture) demonstrate greater innovation, profitability and resilience than those that do not. This will become more important as key trends such as AI reconfigure how work is organised and the skills in demand.

## Organisations need to ensure training is effective

Employers need to prioritise training that will develop valuable skills. Compliance training can be necessary to ensure safety, but when poorly delivered it can cut the time available to develop more practical skills.

Organisations should require a clear use case for compliance training and look to better recognise prior learning through short assessments in place of long and often repetitive compliance training.

Measuring the return on training can demonstrate its benefits for both the employer and employee, while helping to prioritise types of training with greater payoffs. We found only 15 per cent of organisations had a clear approach to measuring return on training investment. This can be challenging, but starting with simple measures such as quality of training and staff retention can build towards measures with closer links to employee productivity.

In sum, employers need to foster a culture that values and encourages learning through data and digital technology to better measure training outcomes and recognise employees that demonstrate skills they need. Best practice also sees training adopted on an ongoing basis and integrated into everyday work tasks.

> ***While organisations must take the lead, governments at federal and state level need to step up efforts to build the foundation skills necessary for all workers to effectively engage with further learning, including literacy, numeracy, digital and communication skills.***

## Governments also need to support training

While organisations must take the lead, governments at federal and state level need to step up efforts to build the foundation skills necessary for all workers to effectively engage with further learning, including literacy, numeracy, digital and communication skills.

A good school system is the key to foundation skills, so this adds to the critical importance of reversing the declines in literacy, numeracy and school completion rates, while ensuring disadvantaged students are not left behind. A holistic strategy should also be developed to reduce the number of adults with low foundation skills.

Better accreditation is needed so that people who move jobs can have their skills properly recognised, reducing the costs of training duplication. Work currently underway to develop a *National Skills Taxonomy* can help by creating a consistent classification of key labour market skills. Using this system to accredit work-related training would enable sharing of skills and qualifications through a trusted digital system such as the *National Skills Passport* currently under consideration.

To build trust from employers, accreditation should proceed gradually, beginning with formal micro-credentials and other courses developed in conjunction with higher or vocational education providers. Along with funding of innovative collaborations, staged accreditation can help drive collaboration between higher education providers, vocational education and industry to develop rigorous and practical training offerings.

There is not a strong case for new, broad-based public funding of training. The key barrier to training is time rather than money. In other countries, government funding of work-related training has mostly just paid for training that would have occurred anyway. An exception is training for people who face considerable barriers to getting into work, such as the long-term unemployed. CEDA has previously argued that training for such people should be scaled up, monitored and evaluated to expand programs that work well.

# RECOMMENDATIONS FOR EMPLOYERS


## BUILD A CULTURE THAT VALUES AND ENCOURAGES LEARNING

a. Establish clear links between training, the organisation's strategic goals, and how employees contribute to these goals.

b. Understand the barriers to training across the organisation, as well as how learning policies interact with day-to-day work requirements.

c. Integrate training so that learning occurs as part of, not on top of, existing work.

d. Empower workers to shape their own development pathways by supporting them to choose what and how they learn.


## MEASURE THE RETURN ON INVESTMENT FROM TRAINING

a. Organisations with limited resources can start by gathering qualitative feedback about training, linking this to development conversations and business outcomes.

b. Organisations with greater capabilities can adopt methods such as random assignment of training or pre-and post-training surveys to capture productivity improvements. Increasingly sophisticated technologies like learning management systems and talent marketplaces can be powerful tools to offer bespoke programs and capture their returns.


## BETTER TARGET COMPLIANCE TRAINING

a. Regularly evaluate compliance training to ensure it is not crowding out other learning. New compliance modules should be supported by clear use cases and an understanding of how they complement existing training.

b. Deploy in a risk-based manner, targeting the highest risk employees first and tailoring delivery to when, where and how it can make the most difference.

c. Minimise unnecessary re-training, such as by using short questionnaires to assess employees' understanding of key compliance themes.

# RECOMMENDATIONS FOR GOVERNMENT

## 1 DEVELOP ACCREDITATION OF WORK-RELATED TRAINING

Building on the *National Skills Taxonomy,* the Federal Government should develop transparent and consistent accreditation of work-related training that provides confidence on the quality of credentials.

a. Begin with formal micro-credentials and other courses developed with higher or vocational education providers, then gradually expand the types of training eligible for accreditation

b. Incorporate data on work-related training into a new National Skills Passport.

## 2 SUPPORT DEVELOPMENT OF FOUNDATION SKILLS

Federal, State and Territory Governments should support development of foundational literacy, numeracy, digital and communication skills needed to effectively engage in training.

a. Reverse the trend of declining literacy and numeracy skills among school students, in particular ensuring children from disadvantaged backgrounds can meet the minimum standards necessary to enable learning in later life.

b. Build on Jobs and Skills Australia's Foundation Skills Study to develop a holistic strategy to reduce the number of adults with low foundation skills, including through vocational education and training.

# WHY WORK-RELATED TRAINING IS IMPORTANT


Work-related training – structured learning to help people become more effective in their jobs – plays a critical role in developing skills needed in the workforce. It builds on school and post-school education, which cultivate the basic literacy, numeracy, communication, digital and other essential skills that enable further learning. These are known as foundation skills. Lifelong learning is increasingly essential for individuals and societies to navigate the rapidly changing world of work.[1]

The time and money devoted to training on the job by firms and workers underline its substantial economic importance.[2] We estimate employers and employees invested a combined $12.6 billion in work-related training in 2022/23. Of this, $7 billion[3] is the direct cost of staffing and materials to deliver training, while the remainder is the time taken by employees to undertake training (costed at their median wage). This figure excludes any training paid for directly by a worker. Firms and workers anticipate this investment will pay off through better customer service, higher productivity, increased safety, wages and/or job satisfaction.

In a time of weak productivity growth, high skills mismatch and low job mobility, it is essential that we make the most of opportunities to improve workers' productivity and career trajectories through training.

> ***"Artificial intelligence (AI) is reshaping roles, changing how work is organised and the types of skills in demand. It is also driving new forms of training, such as Microsoft's AI Academy and tailored offerings within Australian firms.***

**The need for work-related training in Australia is increasing due to a number of workforce trends.**

An evolving economy, due to shifts such as digital transformation and the energy transition, requires retraining and upskilling as new roles emerge and industries adjust.

Artificial intelligence (AI) is reshaping roles, changing how work is organised and the types of skills in demand.[4] It is also driving new forms of training, such as Microsoft's AI Academy and tailored offerings within Australian firms (Case study 1).

Tertiary education is not fully meeting the need for technical skill provision at the leading edge of industry practice[5], particularly in rapidly changing fields such as information technology[6] or clean energy.[7]

Industries that are set to continue to grow rapidly, such as health and education, have relatively high rates of training.[8]

One-third of all occupations are in national shortage, with occupations in key care, clean energy and health sectors particularly likely to have moved into shortage.[9]

An ageing workforce means there is a greater need to update skills to today's needs, and an increasing need for lifelong learning. Together with the trends identified above, this has been estimated to require more than a doubling of the time spent in learning after age 21 by 2040.[10]

The rapid increase in remote working since the COVID-19 pandemic is changing how skills are developed in many roles, with less time for learning by observing colleagues, increasing the need for deliberate training strategies.

### Case study 1: Adapting training to new technologies

MinterEllison, one of Australia's largest law firms, provides a range of training to staff, including compliance, technical, leadership and broader business skills. It has found foundation skills development such as "learning agility" and the ability to think critically are important, particularly in the context of rapid change in Generative AI.

The potential for artificial intelligence (AI) to transform mundane legal tasks led MinterEllison to introduce a Generative AI training initiative by crediting learning time towards their fee targets, and other incentives including digital credentials and issuing its own in-house cryptocurrency, MintCoin. Employees are encouraged to participate in a range of webinars, workshops and experiments and use practical workbooks, sharing ideas in active firmwide collaboration channels.

MinterEllison has developed new learning material to enable successful courses to be scaled up for delivery to more staff, leveraging external learning content libraries and learning developed in-house.

In addition to increasing efficiency and identifying opportunities to use AI, the training aimed to develop new skills such as good prompting of AI tools and spotting errors or "hallucinations" in the tools' output.  MinterEllison's Chief Talent Officer, Nikki Jones, says the firm is able to attract interest from high-quality applicants for roles, who are choosing to apply to MinterEllison because of its adoption of AI and new technologies in law more broadly.

Companies are finding it very important to make information about employees' skills easy to access, to enable managers to find the right skills for the right project. This can be enabled by digital tools such as Talent Marketplace (see Box 2 for more detail).

Measuring the return on investment from training is challenging, as it can be hard to directly attribute business outcomes to learning initiatives. MinterEllison's Head of Learning and Development, Kate Booth says working collaboratively across digital, governance, innovation and people functions is key to assessing the impact of learning on business outcomes. "It's easy to measure the quantity of formal learning, but we are starting to see promising signs of the impact of all forms of learning as we track the uptake of tools and the pipeline of use cases our people are generating," she said.

## There are many different types of work-related training

The term 'work-related training' can refer to a broad range of training types. It can include compliance training to ensure employees comply with relevant laws, regulations and internal policies, or training to develop skills needed in the current or a future job. It can range from initial help to get started in an entry-level job, to high-level leadership training for people in the most senior roles.

In this report we focus on work-related training among employees aged 25 to 64 years. This type of training is distinct from formal training that leads to a qualification, such as a degree or vocational certificate.

While there can be some overlap between work-related and formal training (Figure 1), with some work-related training delivered through collaboration with educational institutions, employers more often deliver informal learning internally, via online learning platforms or supported by consultants.[11] Work-related training is also distinct from personal interest learning, and from 'learning-by-doing' or on-the-job learning that does not require explicit instruction.

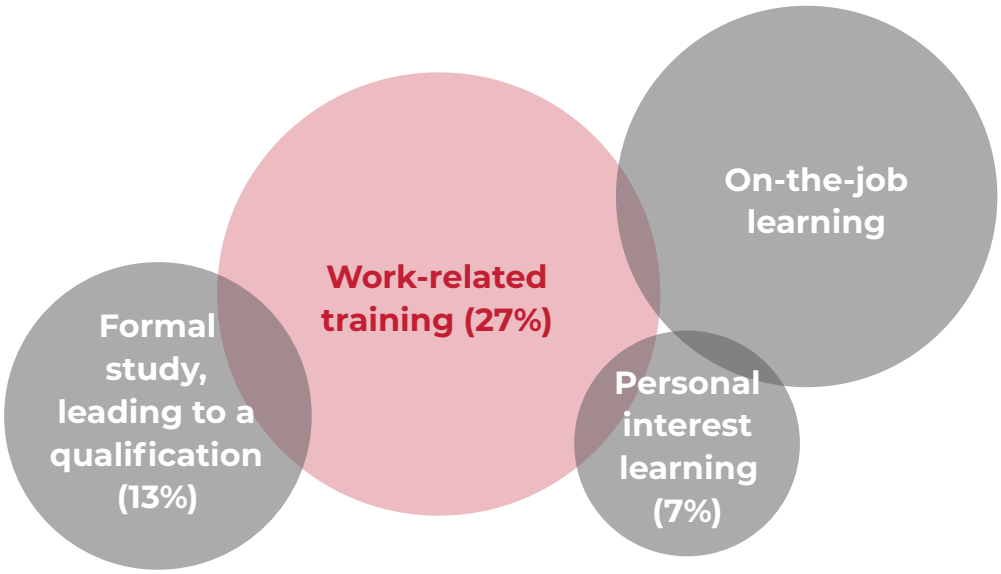
In some cases, formal study and personal interest learning can substitute for or complement work-related training. For example, a training course at work can later provide credit for a qualification, or skills developed through personal interest, such as a photography course, can be used later in a new career.

We focus on work-related training in this report because there is evidence of strong benefits from this type of training, with potential benefits shared between organisations and employees.[12]

Another important aspect of work-related training is the need for organisations and employees to cooperate to access the benefits. Individuals can access formal training themselves (albeit they may face time and financial constraints) but are more reliant on organisations to access non-formal work-related training. Formal study has been shown to offer small labour market returns to adults (aged 25 to 54) in Australia, but does offer benefits through higher job satisfaction and mental wellbeing.[13,14]

An important distinction is between training in skills that are specific to the current firm, and more general training that can be valuable to other employers. Training that is valuable outside the current employer raises the risk of 'poaching' of staff after training. But training within firms is unlikely to be perfectly general and payback clauses if staff leave within an agreed time after training can reduce the risk of poaching.[15]

**Figure 1. Work-related training is the most common structured learning for 25–64-year-olds**




Note: As a form of unstructured learning, data for participation in on-the-job learning is not available.
Source: Australian Bureau of Statistics, *Work-Related Training and Adult Learning*, https://www.abs.gov.au/statistics/people/education/work-related-training-and-adult-learning-australia/latest-release

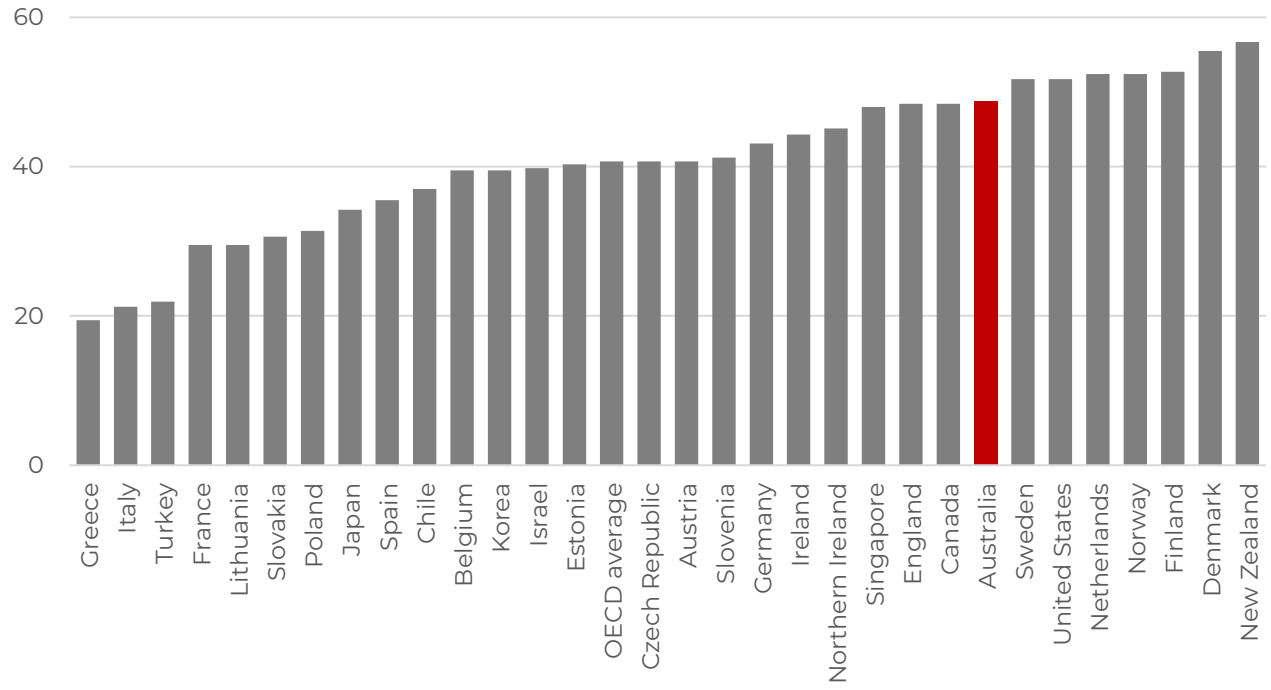
## Trends in take-up

Participation in work-related training is relatively high in Australia, but has lagged leading countries such as the United States, the Nordic countries and New Zealand (Figure 2).

Internationally comparable data on participation in training are more than a decade old, from the first cycle of the OECD Survey of Adult Skills (PIAAC). Data from the second cycle of this survey will be available in December 2024. While Australia has now rejoined PIAAC, it did not participate in the second cycle because of decisions to reduce costs under the previous government.[16] This is unfortunate at a time of growing importance for training, as internationally comparable data on training participation is seldom available.

While data are not available for all OECD countries, participation in training has increased over the past decade in 18 of 27 European Union member countries (Figure 3). The share of employees receiving job-related training in the United Kingdom has also increased, growing by 15 per cent in the decade to 2023.[17] Research has suggested that the positive trend in training participation in Europe may have been a response to rapid innovation,[18] as a rapidly evolving economy is a relevant factor globally.

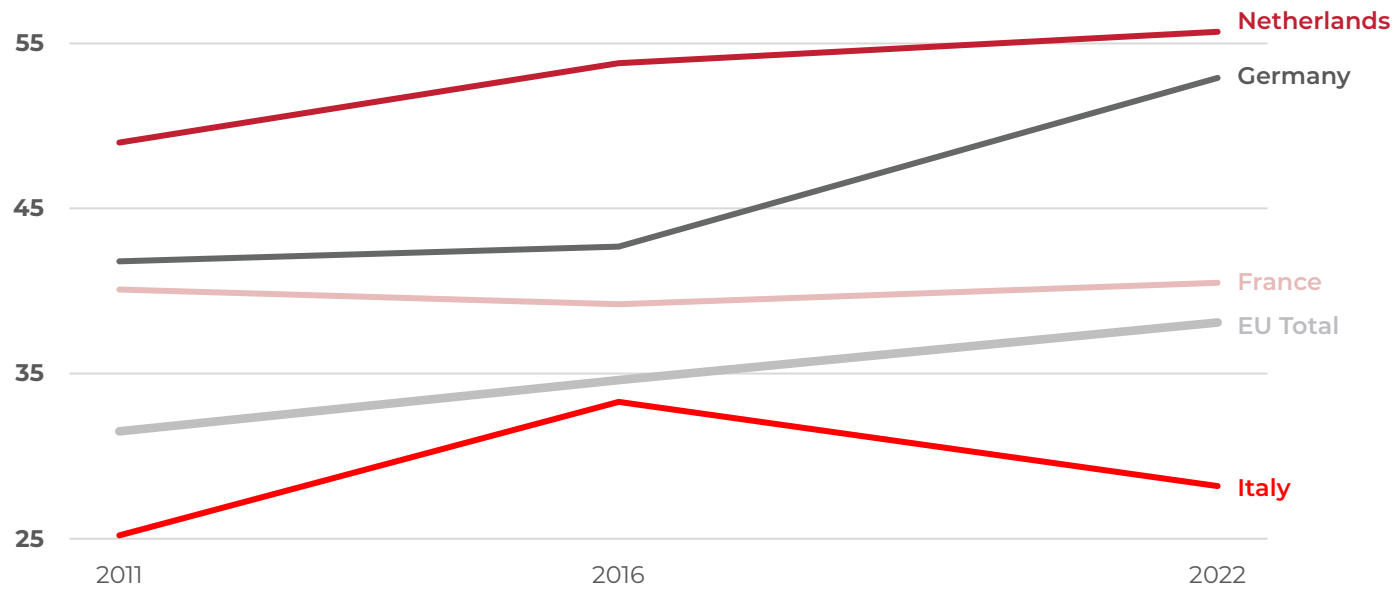
**Figure 2. Job-related non-formal training has historically been high in Australia**
Proportion of workers doing training, 2012 or 2015, %




Note: Data are from the OECD survey of adult skills (PIACC) for 2011-12, except for those countries included in round 2 of PIACC, for which data are for 2014-15 (Chile, Greece, Israel, Lithuania, New Zealand, Singapore and Slovenia).

Source: PIACC data reported in Fialho et al (2019)

**Figure 3. Training has mostly increased in Europe**
Participation in job-related non-formal education and training, last 12 months, age 25-64

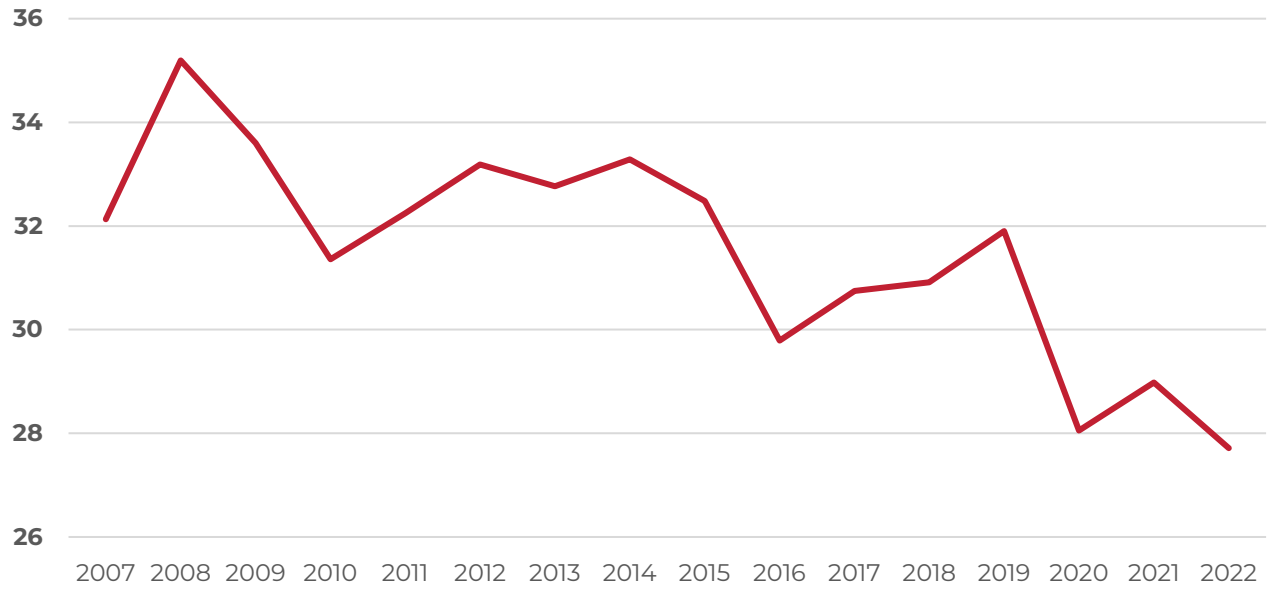



Source: Eurostat Adult Education Survey

In Australia, by contrast, participation in training has steadily declined over more than a decade (Figure 4). Separate data from the ABS show participation in work-related training declined from 27 per cent to 23 per cent of the working-age population between 2013 and 2020-21 (albeit the latest data in this series were affected by the pandemic).[19] This trend is also consistent with data from a survey of employers showing roughly a 15 per cent reduction in the rate of access to training and development for older workers between 2014 and 2023.[20]

Strong growth in training in several countries including the Czech Republic, Austria, Slovenia, Germany, Ireland and England has likely seen them overtake Australia in the share of workers participating in training.

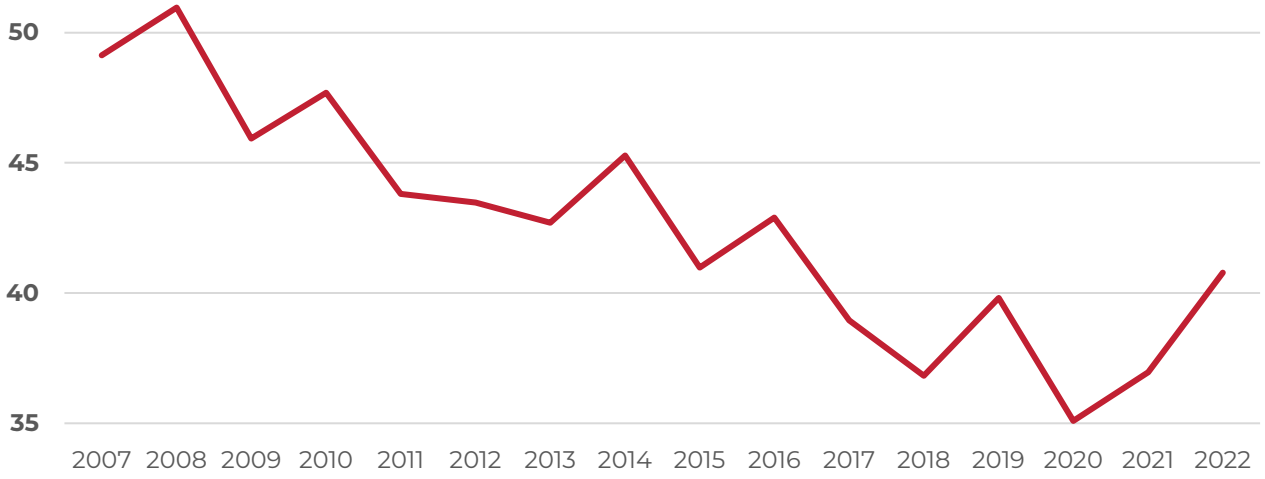
**Figure 4. Australian training rates have steadily declined**
Proportion of workers who took part in work-related training, 2007-2022, %




Source: HILDA Survey, Release 22

In addition to falling participation, the average number of hours spent in training for those who did participate has fallen by 17 per cent between 2007 and 2022, notwithstanding a modest pick-up recently. This translates to a decline in training hours of 6.8 per cent at a whole-of-economy level, despite the number of employed people increasing by 30 per cent in the same period.[21]

**Figure 5. The average number of hours spent training have also fallen**
Average hours spent on work-related training per year, per training participant, 2007-2022




Source: HILDA Survey, Release 22

## Box 1: HILDA Survey data

The Household, Income and Labour Dynamics in Australia (HILDA) survey is our primary data source for analysing trends in work-related training in this report.

The HILDA survey is nationally representative and interviews the same people each year with a wide range of questions about their personal and professional lives. The continuing nature of the survey means it can give statistically powerful insights into how different policy settings or individual characteristics affect economic outcomes over time.

From 2007 onwards the survey asked participants whether in the past 12 months they had participated in any education or training schemes as part of their employment. Those who did training were also asked about their motivation for participating. Our analysis in this report uses responses to these questions to explore how training can influence key labour market outcomes for workers.

One limitation of the survey is that it does not allow us to separate out the main reason workers participated in training. This is an important drawback because it is highly likely that the benefits of training will vary depending on its type and purpose.

For example, training focused on developing practical skills used in daily work life (such as team leadership skills or developing knowledge around new developments in industry) will likely deliver more immediate value than annual compliance modules.

Future research in this area could therefore be supported by data that breaks down the time spent on different types of training.

## Who participates in training?

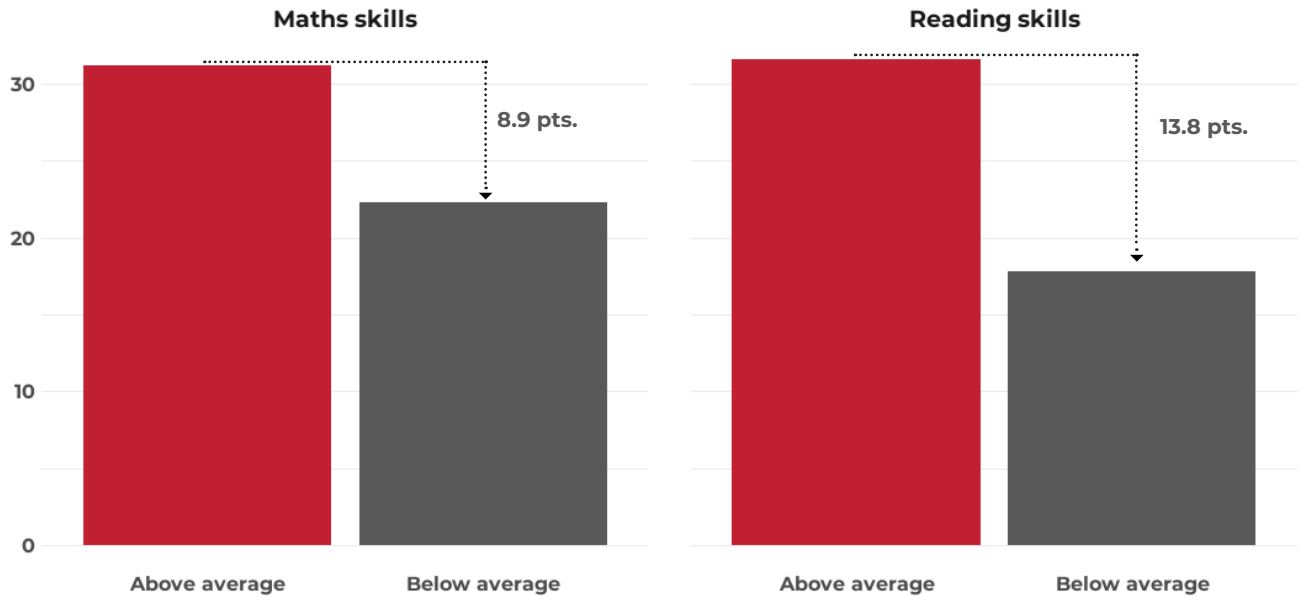
Participation in training is not distributed evenly across the economy. Those working in healthcare, education and public administration were more likely to participate in training, while clerical and administrative workers, as well as those working in the agriculture, forestry, fishing and wholesale trade industries, were less likely to have trained.

Men were less likely to have participated in training than women, even after accounting for the higher concentration of women in industries with greater adoption of training, such as healthcare (for full results, see Table 4.2 in Appendix 4). Those who were unmarried or employed on a part-time basis were also less likely to have trained.

Higher levels of education were also associated with training participation, emphasising the ongoing importance of foundation skills to workers' ability to retrain and adapt to evolving job requirements. Individuals who reported above-average reading skills were around twice as likely to participate in training as individuals who reported below-average skills (Figure 6).

**Figure 6. Those with above average maths and reading skills were more likely to participate in training**

Average workplace training participation by self-reported skills (2012, 2016, 2020), %




Note: Results are calculated by grouping the self-reported responses to HILDA questions which ask individuals to rate their math or reading skills compared to the average Australian on a ten-point scale (higher scores indicate greater self-reported proficiency). The 'Above average' group comprises scores of six or higher, while the 'Below average' group comprises scores four or lower.

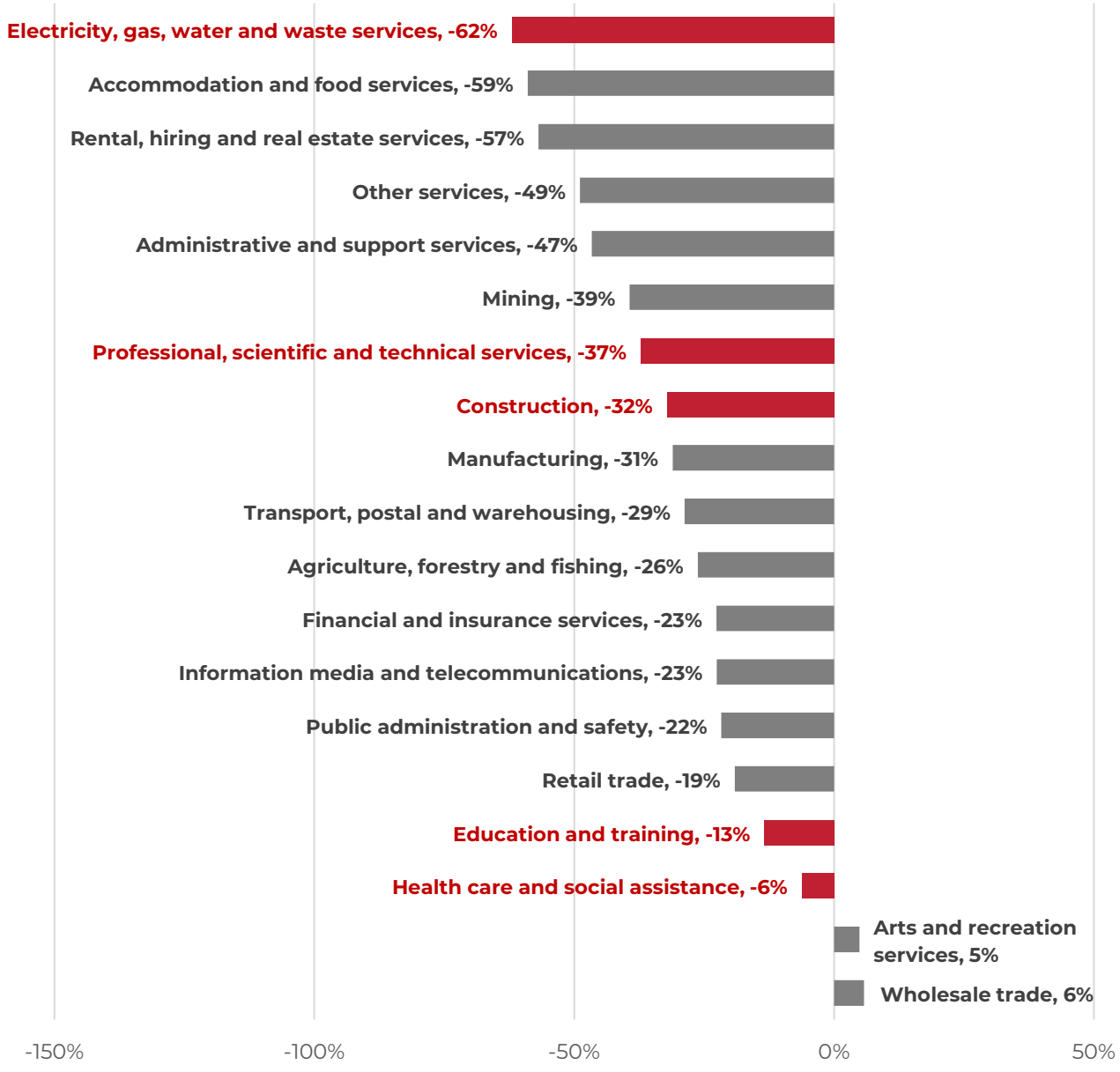
Source: HILDA Survey, Release 22

Declining participation in training has occurred despite industries and occupations with relatively high rates of training, such as health and education, growing their share of national employment and those whose share of employment has shrunk, such as retail trade and manufacturing, having lower training rates. We estimate that the decline in training would have been almost one-third larger if the economy had not shifted towards industries with relatively high rates of training (Appendix 4).

Between 2007 and 2022, only two of 19 industries saw increases in training participation, with the majority of other industries demonstrating double-digit declines (Figure 7).

Concerningly, there were large declines in fields where structural changes such as the green transition and digital transformation are likely to demand increased levels of upskilling and retraining. These included: utilities (-62%); professional, scientific and technical services (-37%); construction (-32%); education and training (-13%); and healthcare and social assistance (-6%).

**Figure 7. Training has declined in structurally important industries**
Change in the training participation rate between 2007 and 2022, %




Source: HILDA Survey, Release 22

These declines are problematic because there are persistent labour shortages in these sectors. Workers with higher levels of training are more efficient in their roles and can help mitigate some of the impacts of shortages while longer-term policy solutions such as increased support for higher education and tailored migration strategies come into effect.

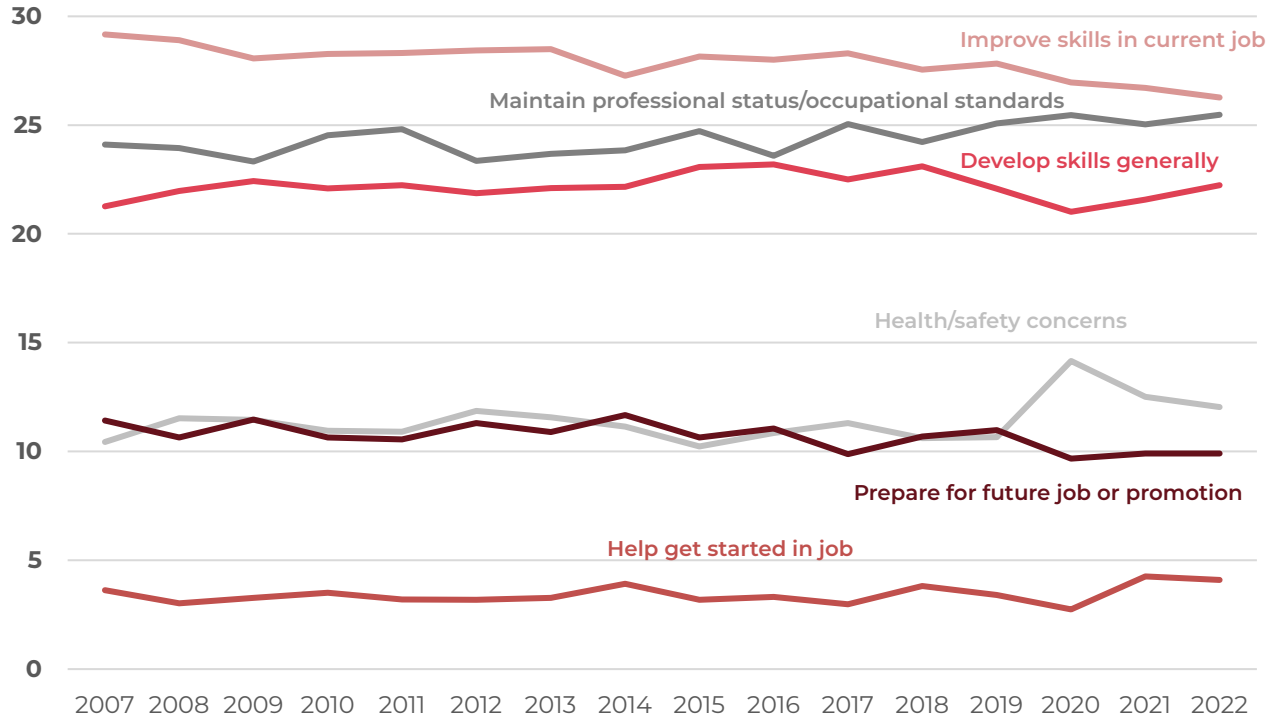
One possible explanation for declining participation in work-related training is greater reliance on on-the-job training. Data do not capture such forms of unstructured training, so it is hard to reject this explanation, but nor is there evidence of a trend towards more unstructured learning on the job. Conversely, the recent increase in working from home works against such a trend.

## Why do workers and employers train?

There are many motivations for organisations to offer training and for workers to participate in it, ranging from a need to meet mandatory safety requirements through to developing new skills that can help support professional advancement.

The aims of participation in training have broadly stayed consistent over time (Figure 8). Two of the top three reasons for training relate to enhancing workers' skills, accounting for just under half of all responses to the question about why survey-takers engaged in training.

**Figure 8. Aims of training have broadly stayed consistent over time**
Proportion of responses to question 'what were the aims of any of this training?', 2007-2022, %




Note: Survey respondents could select more than one answer. Results show the ratio of responses relative to the total number of answers provided in a given wave.

Source: HILDA Survey, Release 22

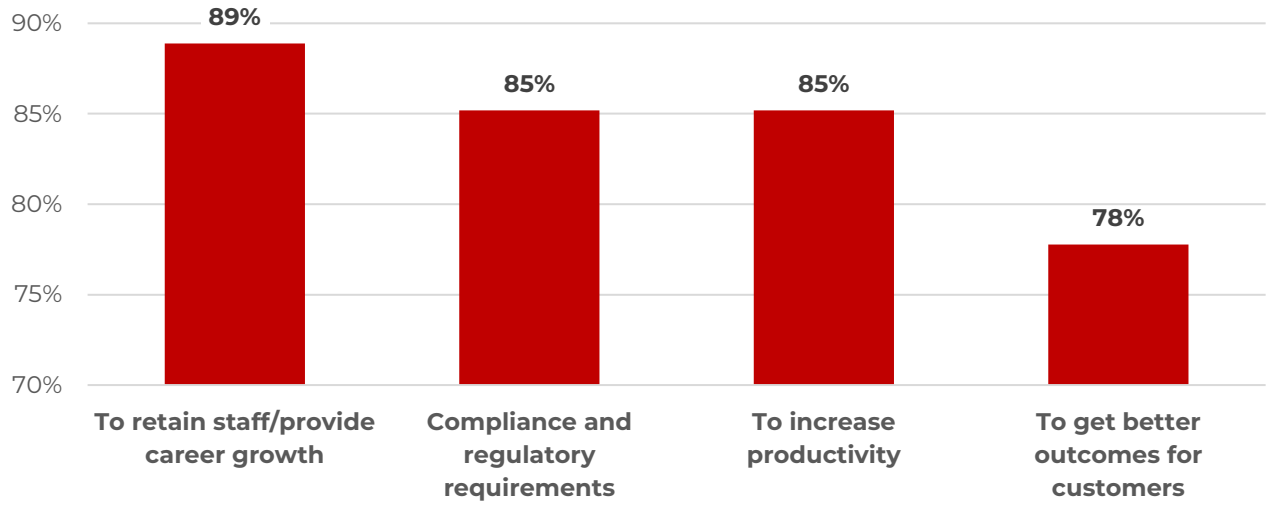
Recent years have seen an increase in responses related to occupational licensing and compliance training. These types of training can play an important role in ensuring workers can effectively manage their professional and safety responsibilities in the workplace, particularly in highly regulated industries where compliance is important to achieve organisational goals. There can also be overlap between maintaining professional status and improving skills, for example where continuing professional development is well-targeted and effectively delivered.

However, evidence from the US shows that compliance training can be relatively ineffective at improving desired outcomes when compared with other approaches, such as establishing direct responsibility for outcomes.[22] Training is ineffective without a strong culture of compliance, which must come from leadership. There is also a common perception among staff that compliance training is too time-consuming and a burden,[23] suggesting it could be made more relevant and better targeted.

Employers must take care that compliance training does not crowd out time for upskilling in more functional areas, which can lead to broader productivity gains for the organisation (Case study 2). Indeed, it is noteworthy that the increase in responses for the category 'Maintain professional status/ occupational standards' coincides with a decline in the 'improve skills in current job' category.

These trends are reflected in responses to a questionnaire of 27 CEDA members, which show compliance and regulatory concerns were a key driver for providing training (Figure 9).

**Figure 9. Retaining staff and compliance are key drivers for offering training**
Response to survey question 'Why does your organisation offer training?'



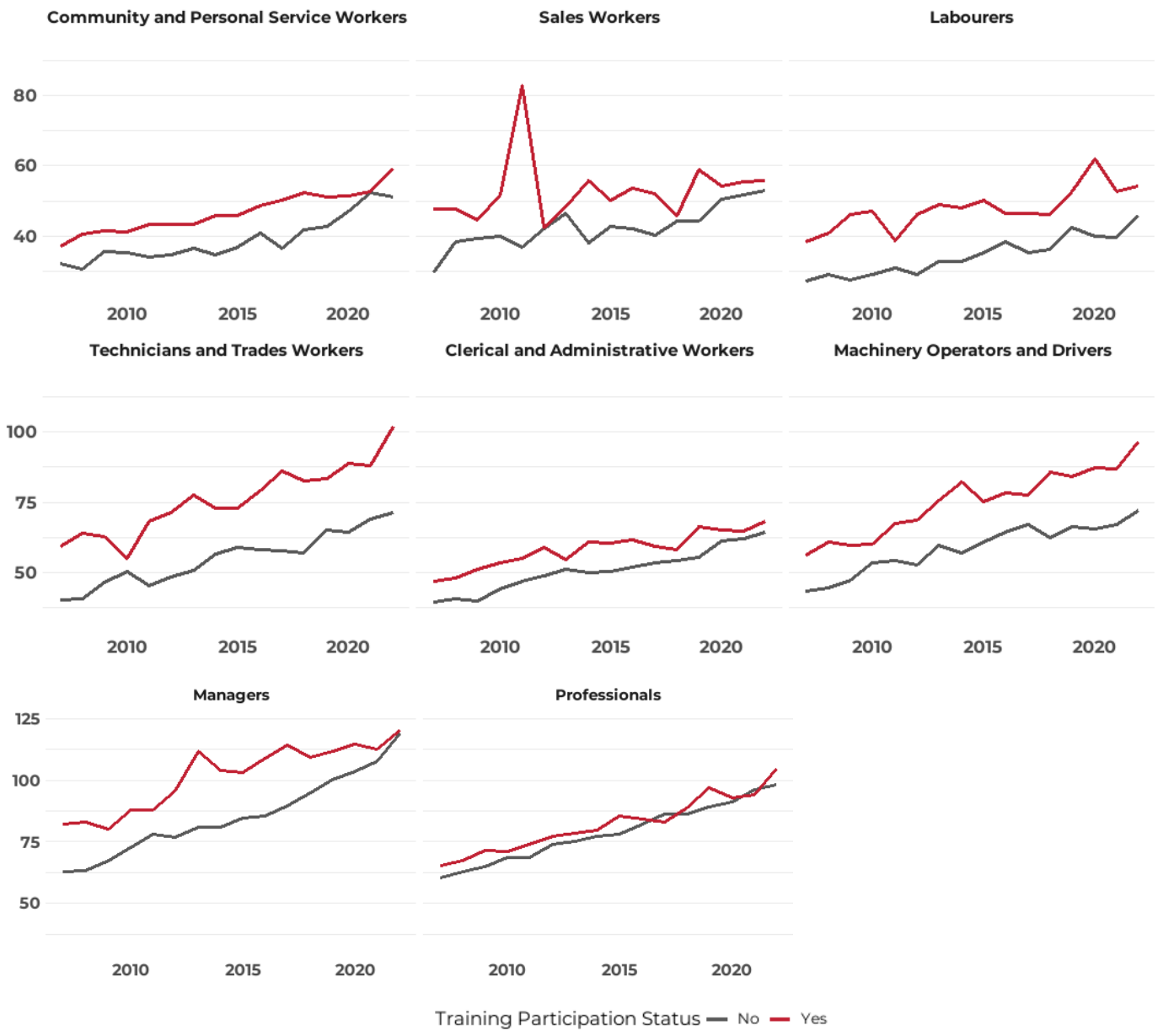

Note: CEDA's survey had a sample size of 27 organisations. The majority (23) of respondents had over 100 employees, with 14 having over 1000 employees.

# WHO BENEFITS FROM WORK-RELATED TRAINING?

For employees, training is associated with significant income gains. Across all occupation groups, real incomes were higher for workers who participated in training compared to those who did not (Figure 10).

**Figure 10. Training participants generally enjoy higher incomes than non-participants across all occupations**

Average nominal income by ANZSCO occupation group by training participation status, $000s




Note: Occupation groups here refer to 2-digit ANZSCO classifications.

Source: HILDA Survey, Release 22

Differences in personal characteristics may be part of the reason for higher incomes for those who do training. These include:

- Observable differences: people who do training may be different to those who do not, such as having higher levels of initial education or work experience;
- Unobservable differences: people who do training may earn more due to characteristics that are difficult to measure, such as individual motivation or the ability to connect with and influence colleagues; and
- "X factor": people chosen for training may have potential that is not reflected in observed characteristics or current incomes.

Our analysis shows training was associated with real incomes (the income earned after adjusting for inflation) that were 23 per cent higher the year following participation and still five per cent higher three years after training (Appendix 4).

We also wanted to understand how much of an impact training had on the path of an individual's real wage growth (Figure 11). To do so, we examined comparable individuals who either did or did not do training (for a full explanation of our approach, see Appendix 4). While these groups initially follow a similar growth trend, participants see their income accelerate and overtake the non-participant group during and following the first year of training, before levelling off again.

These two approaches indicate a significant relationship between training and income growth after accounting for the observable and unobservable characteristics reflected in incomes prior to training.

There remains a possibility that employers target training towards staff with an "X factor", i.e. high-performing staff that they intend to promote anyway.

> ***Because improvements to productivity give businesses greater capacity to fund wage increases, these results may suggest training is helping organisations to enhance their efficiency.***

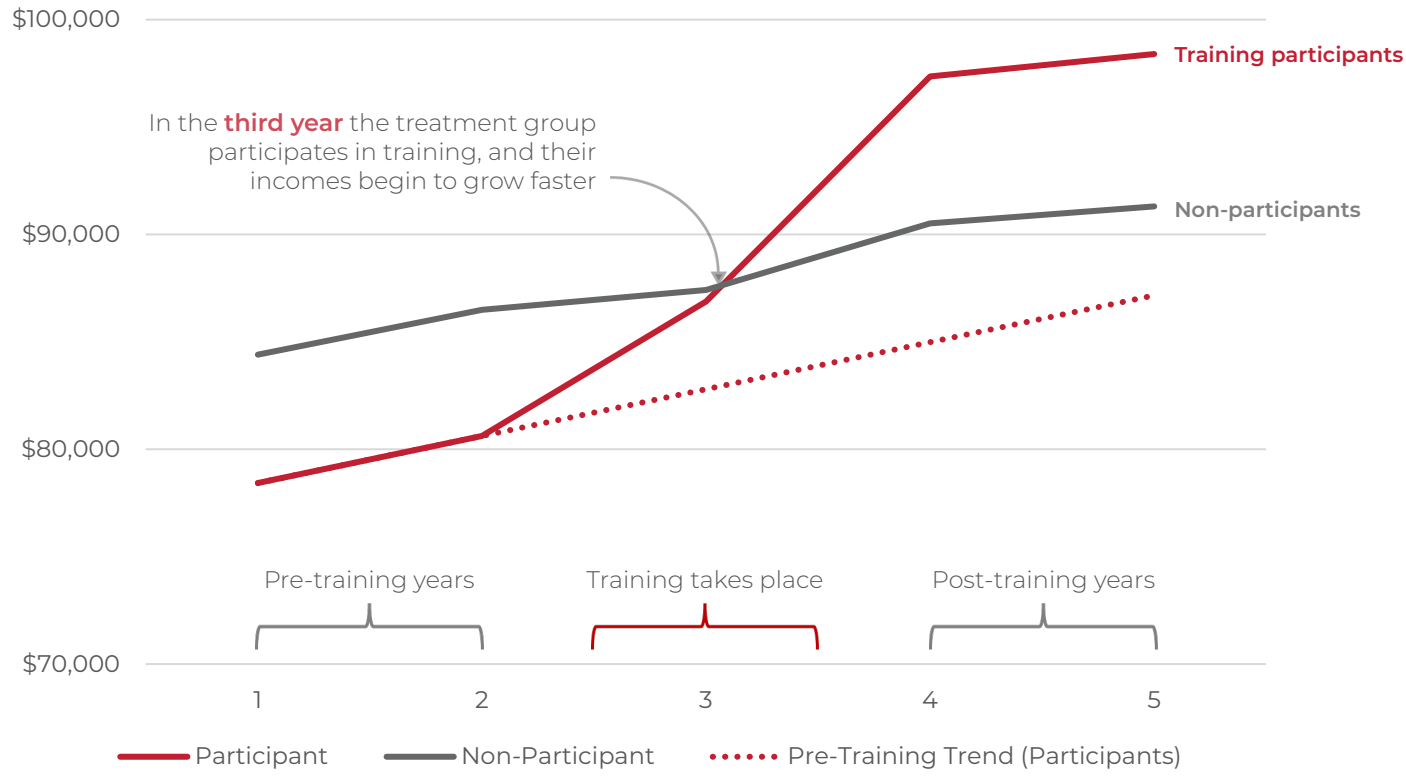
For this reason, we do not interpret our results as causal effects of training. However, the similar pre-training trend for participants and non-participants (Figure 11) does suggest training is important, as high potential is not translating into higher income growth before training commences.

With Australians experiencing tepid growth in real wages over the past decade (averaging just 0.6 per cent per year between 2010 and 2020),[24] these results represent a powerful incentive for workers to participate in training.

Additionally, because improvements to productivity give businesses greater capacity to fund wage increases, these results may suggest training is helping organisations to enhance their efficiency. Indeed, international evidence indicates training may have an even stronger effect on productivity than on wages.[25]

**Figure 11. Incomes show signs of accelerating after training**

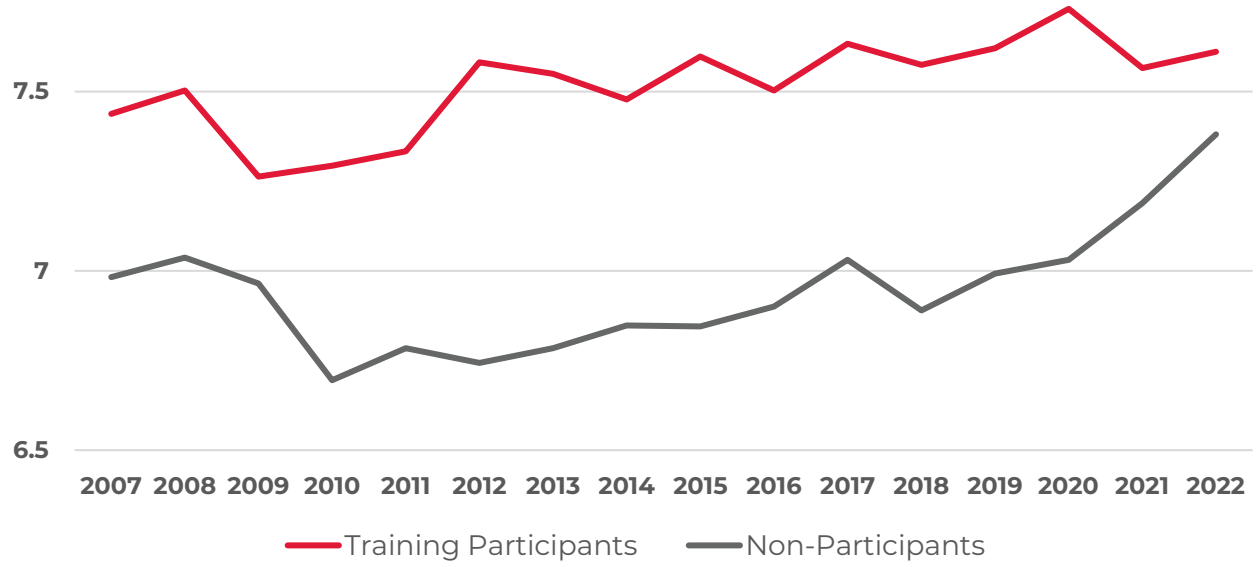
Comparison of average incomes by training participation status, inflation-adjusted




Note: "3" indicates the year in which a person first received work-related training. Participant and non-participant groups are classified based on whether they receive training in the treatment period, year 3. Both groups must not have participated in training in the two years prior to the treatment period. Due to small sample sizes, we do not impose controls following the treatment period (i.e. individuals of either group can participate or not participate in training in years 1 and 2). Data covers the period 2007-2022, however our analysis excludes years influenced by the COVID-19 pandemic (2020-2022). To address selection bias, we employ a 'nearest neighbour' matching technique to ensure comparison is among like individuals. Income increases in the year that training takes place reflect that training could have occurred anytime in the past 12 months.

Income increases are far from the only benefit arising from training participation. We find that those who trained also reported greater levels of satisfaction at work (Figure 12), and were more likely report a promotion the year after receiving training (Figure 13).

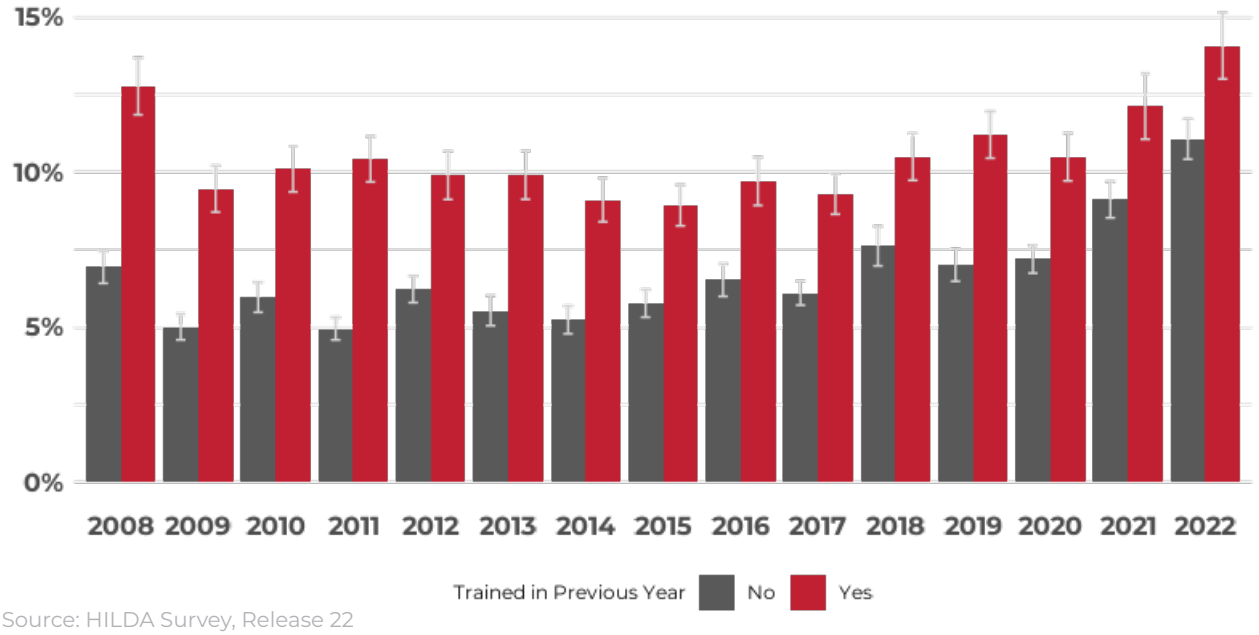
**Figure 12: Participants reported more satisfaction at work than non-participants**
Average score to HILDA survey question 'all things considered, how satisfied are you in your job', scaled 1-10




Source: HILDA Survey, Release 22

Higher levels of satisfaction and engagement at work have been found to boost overall productivity,[26] strengthening the case that increasing training could help employers address stagnant productivity growth.

**Figure 13: Participants were more likely to be promoted the year after training**
Proportion of individuals who were promoted by training status, %



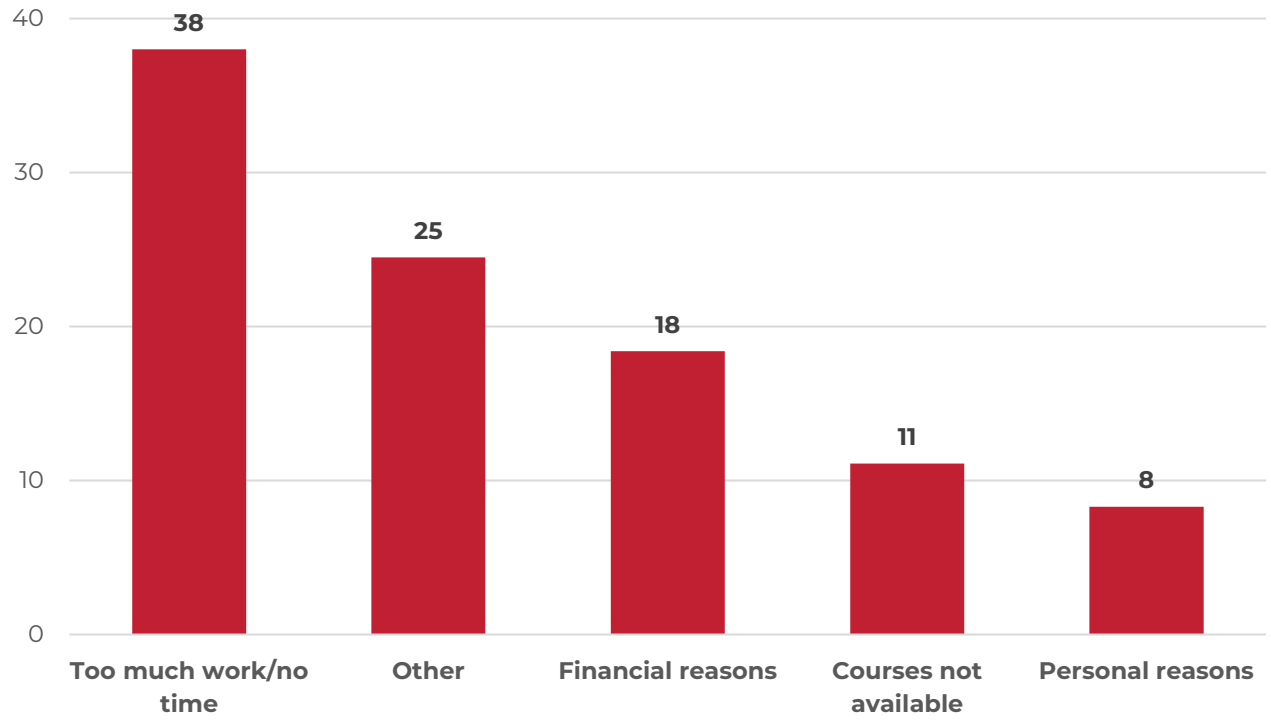

Source: HILDA Survey, Release 22
Note: Error bars show the range of uncertainty around each bar's value, indicating that the actual number may be slightly higher or lower.

# WHAT ARE THE KEY BARRIERS TO TRAINING?

The leading barriers to work-related training are time and cost (Figure 14). Among the organisations surveyed by CEDA, 78 per cent identified challenging workloads as a barrier to training delivery and adoption. ABS data shows that among individuals aged 25-64 who wanted to participate in non-formal learning but could not, too much work or no time was the most important reason, with 40 per cent citing this as the main barrier.[27]

Unavailability of courses is less commonly cited as a barrier (Figure 14). While the supply of online courses has increased over time and some organisations noted their increasing quality, they can be of variable quality (Appendix 2). Overall, the share of people citing unavailability of courses as a barrier to non-formal training has almost doubled since 2013.[28]

**Figure 14: Time constraints were the key barrier to participation**
Main barrier to participating in non-formal training, 2020-21, %




Source: Australian Bureau of Statistics, Work-Related Training and Adult Learning, 2020-21 Table 17

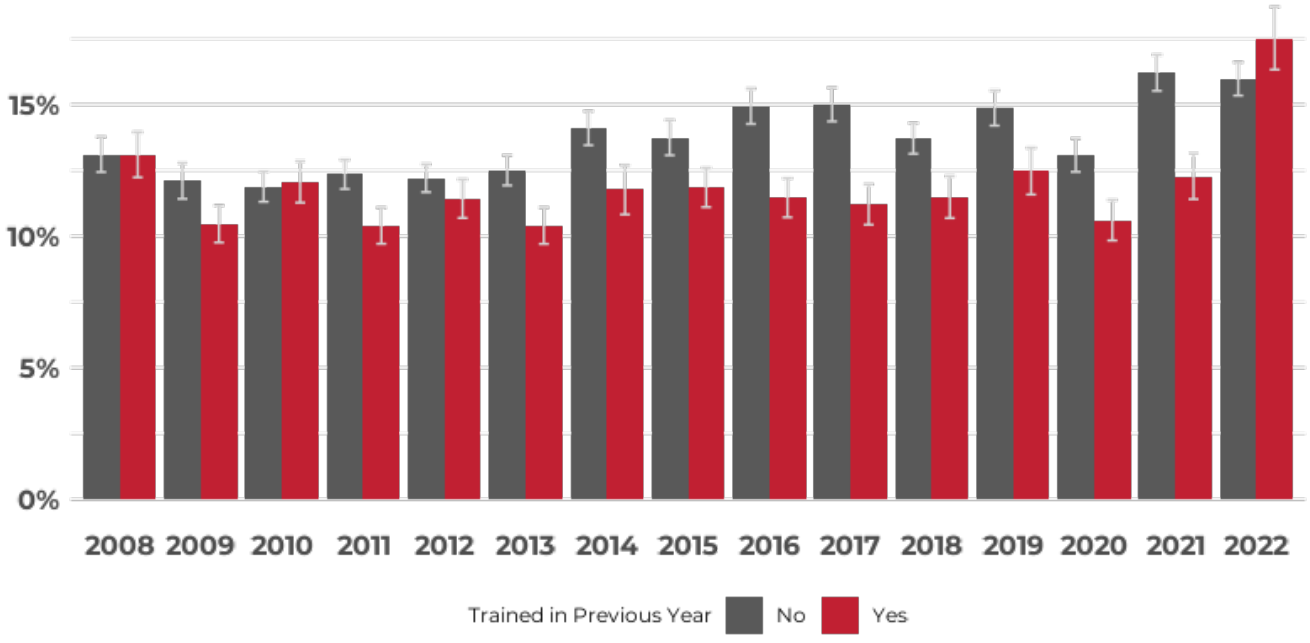
With separate ABS data showing that professionals today are working 22 per cent more hours than in 2014,[29] training increasingly needs to compete with other demands at work. Indeed, our analysis of HILDA data shows that one-in-four workers complete training outside paid work hours.

Support for training may also be hindered by employers concerned that staff who receive training will leave and take their new skills to a competitor, without the organisation getting the benefit of its investment. While these concerns are understandable, our analysis found training participants were actually less likely to move jobs after receiving training compared with workers who did not (Figure 15).

While evidence of stronger staff retention is good news for organisations, it may be problematic for workers where their training is not adequately recognised and transferrable to other jobs. The need for better accreditation of training is discussed below.

**Figure 15: Training participants were less likely to move jobs in the following year relative to non-participants**

Proportion of individuals who moved jobs by training status, %




Source: HILDA Survey, Release 22
Note: Error bars show the range of uncertainty around each bar's value, indicating that the actual number may be slightly higher or lower.

Conversely, several organisations we consulted with also highlighted problems that can arise when training is not offered, such as the risk of staff leaving if they do not receive high quality learning and development opportunities. If talented employees leave because this need is unmet, businesses may suffer blows to their overall productivity and competitiveness.

# HOW TO ENABLE WORK-RELATED TRAINING: ORGANISATIONS

Employers have the most influence on the availability and uptake of training. Government policy can complement this, in particular through transparent and consistent accreditation, ensuring development of foundation skills at school and facilitating cooperation between business and training providers.

## Steps organisations should take

Because organisations stand to benefit from better-trained employees, it is essential that they take an active role in promoting access to high quality training and support its adoption. The steps organisations should take are:

1. Build a learning culture;
2. Measure success; and
3. Better target compliance training.

## Building a learning culture

As a first step, employers should foster a culture that values and encourages learning by identifying how training can align with and support organisational goals. For instance, businesses that expect more of their services will be offered digitally can identify training to fill future gaps in technical capabilities.

Organisations should also invest time in understanding the barriers to training adoption and how they vary for individuals and across teams within the business. As discussed above, this often entails balancing training goals with employee time constraints, including allocating work time to training.

As difficult as this can be, firms must challenge the status quo and reject the idea that workloads are an insurmountable obstacle to training. Previous CEDA research has shown organisations need to make time to enhance their internal capabilities.[30] It found firms that adopted strategies to nurture a learning culture demonstrated greater levels of innovation, profitability and resilience than those that did not.

Best practice sees training adopted on an ongoing basis and prioritising 'learning in the flow of work.'[31] This means leveraging existing systems and processes to encourage training that is part of, not on top of, everyday work tasks.

For example, project management software now enables managers to attach training materials to tasks or routines. These approaches work best when materials are thoughtfully curated and made available in easily digestible formats, such as short videos.[32]

Organisations should also evaluate the policies they have in place to support training and assess whether they are sufficiently flexible to encourage participation. Learning and development leads should examine how these policies interact with competing demands on workers' time and which strategies can best address this. For example, if employees in client-facing organisations are evaluated primarily on their billable hours, even the highest-quality training will not be taken up if it means losing out in performance reviews that influence promotions and compensation (see Case study 1).

Where possible, organisations should seek to recognise and reward employees for their achievements, both formally (through credentials or badges) and informally (by celebrating achievements in existing forums like team catch-ups). Mangers have a vital role in building successful learning cultures by providing resources for learning, serving as a role model and encouraging workers to reflect on their work and choose what and how they learn.[33,34]

## Measuring success

Our research identified a lack of frameworks to quantify the benefits of training. Only 15 per cent of organisations that responded to our questionnaire had a clear approach to measuring return on investment.

Measuring success is important as it can help managers to understand and promote programs that have the greatest impacts on worker productivity and effectiveness. It can help support an efficient use of training budgets and help prevent anecdotal and ad hoc selection of training providers.[35]

For organisations with limited resources, simply recording training participation and work outcomes like promotions or role changes can be valuable.

> ***"Declining costs and an ever-increasing range of digital offerings have helped increase the accessibility of learning content. But this also makes it harder to know which training is relevant for which employees. Recent tightness in the labour market has also made organisations consider how to use their current workforce to best meet skills needs.***

Managers can use existing processes like annual performance reviews to gather qualitative feedback about the usefulness of training and connect this to broader development conversations or business outcomes. Learning management systems are also growing in sophistication and can be a powerful aid for gathering data to complement qualitative feedback.

Organisations with greater resources can also use tools like pre-and post-training surveys or randomly assigning training among staff. These can be particularly valuable for assessing the impact of training on technical skills. For example, asking staff about their levels of confidence or the time they spend on a task before and after receiving training can give valuable insights into productivity outcomes as well as the quality of training providers and delivery methods. Sophisticated, AI-powered tools are also emerging to help companies understand their skills gaps and promote training among staff (see Box 2).

## Box 2: Using technology to target training

**Declining costs and an ever-increasing range of digital offerings have helped increase the accessibility of learning content. But this also makes it harder to know which training is relevant for which employees. Recent tightness in the labour market has also made organisations consider how to use their current workforce to best meet skills needs.**

**New technology is helping to address these challenges.**

**Talent marketplaces are digital platforms that leverage data analytics, algorithms and user inputs to develop profiles that capture the skills, experiences and career aspirations of employees. They are then matched with internal opportunities such as vacant roles, under-resourced projects, or skill-based tasks.**

**In addition to enhancing internal job mobility, one of the core benefits of talent marketplaces is their capacity to support highly personalised learning and development.**

**By highlighting the skills employees already possess, these platforms can offer bespoke training options to help workers meet their career ambitions in a way that also meets current and future organisational needs.**

**This technology provides a tangible link between training and career development pathways, creating a powerful incentive to engage in ongoing learning.**

**These platforms are already being adopted at scale and yielding clear results.**

**In the US, consulting firm Booz Allen reported that within 12 months of rolling out its talent marketplace, employees had earned more than 4000 badges or certifications for training aligned with critical future business needs.**

**Earning these badges was a two-step process, with workers first needing to complete the credential and then have a manager validate that they could apply the skills in a practical context. Highlighting how skills development unlocked access to different career opportunities was identified as a key driver of success.**

## Better targeting compliance training

As noted above, compliance training is important to ensure work is done safely and in accordance with operating or regulatory requirements. This type of training is broad and varies by industry, but can cover areas such as:

- Workplace health and safety;
- Data protection and privacy or cybersecurity;
- Managing conflicts of interest;
- Diversity, equity and inclusion;
- Anti-bribery and corruption; and
- Codes of conduct.

Training that gives employees clarity about their roles and responsibilities in the workplace is necessary to help businesses run effectively. However, repetitive or high volumes of compliance training can overwhelm staff and reduce their willingness to pursue learning that develops more practical skills.

Employers should be rigorous in evaluating the training they require employees to complete. The introduction of new compliance learning should be supported by clear use cases, with dedicated processes in place to ensure it is adding real value and not just a 'tick the box' exercise (Case study 2).

Compliance training needs to be deployed in a risk-based manner, targeting the highest risk employees first and tailoring delivery to when, where and how it can make the most difference.[36] Leading firms are looking to increase the use of compliance training that is triggered by monitoring, fit-for-purpose, continually reviewed and delivered in smaller chunks.[37]

Organisations can also experiment with novel ways of recognising prior compliance learning. For instance, some are trying short questionnaires that assess employees' understanding of key compliance themes. Workers can demonstrate that they still have the required knowledge through a short assessment, rather than having to sit through hours of training they may have completed just 12 months prior (and on a recurring basis). Such approaches will need to be balanced against changes to operating or regulatory environments. And governments need to consult effectively with industry to ensure that new regulatory requirements are proportionate and do not unnecessarily increase the burden from compliance training.

# HOW TO ENABLE WORK-RELATED TRAINING: GOVERNMENTS

## Steps governments should take

### Better accreditation of training

One key barrier to the uptake of training is that it may not be recognised when people move to a new employer. This can limit job opportunities and wages for those who have previously done work-related training.

Whereas most vocational and higher education offerings are verified by regulators such as the Australian Skills Quality Authority (ASQA) and Tertiary Education Standards and Quality Agency (TEQSA), the wide range of informal and ad hoc offerings means that most work-related training is not verified or accredited.

Employees can be required to repeat the same training when they change job even if they have already developed the skills required, simply because their training or experience is not recognised. Lack of recognition can be a problem even within large organisations – one respondent to our member questionnaire highlighted the need for better talent management to recognise learning within large employers.

Moving towards greater accreditation and recognition of work-related training will make skills more portable, improve the use of skills already developed, reduce duplication of training and provide a greater incentive for employees to undertake training that is valued in the labour market.

> ***"Accreditation needs to be transparent, accurately reflect training quality and be trusted by employers.***

### Case study 2: Making learning more effective

**Banking sector regulation has increased since the 2008 Global Financial Crisis and the 2018 Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry. Like all banks, Westpac ramped up risk- and compliance-related learning in response to this regulation and the need for better risk management.**

**But the rapid increase in such training meant staff began to equate all learning with compliance, undermining a previously strong culture of learning. At one point there were 193 modules of mandatory training across the organisation, generating frequent internal complaints about the increased time impost on employees, particularly front-line staff who directly serve customers. Much of the risk and compliance learning to this point was ineffective, repetitive and based on rote learning.**

**In response, the bank reviewed its mandatory learning and reduced it by 37 per cent by removing duplicated content, simplifying messaging and improving the learner experience. The bank also improved its governance around how it commissioned new mandatory learning. All new learning requests now undergo a rigorous triaging process followed by approval through a forum of senior business leaders. Collectively, these changes have improved the learning culture.**

**This focus on prioritising learning needs has also freed up capacity for training to build new skills, especially those that benefit customer outcomes and future-fit capability.**

**Partnering with universities and external partners**

**Westpac has also seen benefits from partnering with universities, professional services and education providers to develop tailored learning to address priority skill areas such as data and digital. These specialist service providers bring deep analytical thinking, rigour, intellectual property and technical skills to the design of learning content.**

Accreditation needs to be transparent, accurately reflect training quality and be trusted by employers. The Noonan review of the Australian Qualifications Framework recognised the need to recognise shorter-form credentials, including micro-credentials, to provide quality assurance, portability and confidence for employers and industry associations.[38] Such credentials delivered post-qualification can enable up-skilling to address new developments and skill needs.[39]

Two Federal Government initiatives have the potential to improve accreditation.

1. Work is currently underway to develop a *National Skills Taxonomy,* which seeks to develop a common classification of skills that can help enhance occupational mobility and align workforce capabilities with industry needs. While this is not sufficient of itself, it is an important first step towards better recognition of work-related training through creating a consistent classification of key skills.

2. Consultation has also begun on the possible development of a *National Skills Passport*. The consultation paper notes this would allow individuals to view, share and assess their skills and qualifications across Vocational Education and Training (VET) and higher education through an integrated digital system validated from trusted sources. Countries such as Singapore, Europe, the Netherlands and the US use digital platforms to provide students and workers with a record of the skills and qualifications they have attained.[40]

A skills passport would only provide benefits for work-related training if it included a system to validate and accredit such training. The challenge here is that too much regulation, for example requiring accreditation of all training, would make it difficult to innovate and offer new forms of training.

A balanced path forward would be to gradually expand the types of work-related training that are accredited, for example starting with formal micro-credentials. Accreditation of micro-credentials would boost incentives for partnerships between industry and tertiary institutions, with potential to increase the quality of learning where micro-credentials replace employer-delivered courses.[41] Trust from employers would be critical, and would be hard to rebuild if lost. This points to the need to gradually build up accreditation, while monitoring progress, evaluating impacts and refining policy settings – rigorous empirical evaluation of work-related training policies is necessary but rare.[42]

Over time, there is potential to expand the National Skills Passport into a unified credentials platform, as recommended in the 2021 review of university-industry collaboration in teaching and learning. This would go beyond verification of skills to also provide evidence of current and emerging skills shortage, and information to help individuals to make informed learning decisions.

## Strong foundation skills are essential

Foundation skills, or basic literacy, numeracy, communication and digital skills, provide the necessary platform to effectively engage with further training. This means it is important to build skills early in life, to avoid higher costs later and to create a virtuous cycle where adults with high proficiency are significantly more likely to participate in formal and non-formal learning that further develops skills.[43]

The link between foundation skills and future learning adds to the critical need to reverse the decline in literacy and numeracy skills among Australian school students. Australia's scores on standardised tests have declined by five per cent for reading and seven per cent for mathematics over the 19 years to 2022.[44] Tens of thousands of students do not meet NAPLAN minimum standards in reading or numeracy each year. Across Australia, only 78.7 per cent of full-time students continue to year 12, down from 83.3 per cent in 2017.

Strong foundation skills should primarily be built through early and school education. Teachers must be enabled to focus on high-value rather than administrative tasks, to lift the overall quality of teaching and to roll out best practices across all schools.[45] In particular, children from disadvantaged backgrounds should be supported to meet the minimum standards needed to enable learning in later life.

Beyond this, two to three million adult Australians still lack the basic literacy and numeracy skills required for modern life. Support to build foundation skills among adults needs to be readily available and de-stigmatised.

As the Productivity Commission has recommended, Australia needs a strategy to reduce the number of adults with low foundation skills, including through vocational education and training.[46] Jobs and Skills Australia is currently undertaking a multi-year *Foundation Skills Study*, which can form a valuable evidence base to develop a new strategy to improve these basic skills among adults, leveraging the latest data and technology.

## There is not a strong case for new, broad-based public funding of training

The broader societal benefits from training to build work-related skills can be an argument for government funding, in the same way that governments fund school and higher education. There are examples of this internationally, such as Singapore's SkillsFuture Credit, which provides just over AUD$500 for a wide range of eligible courses to Singaporeans aged 25 and above, with a top-up of AUD$4500 for those aged 40 and above.[47]

However, there are several reasons why broad public funding of training should not be a priority for Australian governments.

- Substantial benefits from training flow to individuals, as reflected by the strong income growth for those who commence training (Figures 10 and 11).

- The key barrier to training identified in our survey of CEDA members is time rather than money (Appendix 2), with more than twice as many responses citing lack of time than financial constraints.
- Internationally, funding work-related training through broad tax incentives or subsidies proved to be an 'experimental disaster' that largely paid for training that would have occurred anyway.[48] Examples include European co-financing schemes that tended to generate large deadweight losses,[49] Dutch tax deductions for training employees aged over 40, which mainly postponed rather than increased training,[50] and in Australia over $28 million in trainee funding for the burger chain Grill'd, where the dropout rate for compulsory training reached 60 per cent.[51]
- There are other, industry-specific options to fund training where there is systematic under-provision for structural reasons, such as small firm size and frequent job moves. For example, Construction Skills Queensland funds training via a 0.1 per cent statutory training levy on all building and construction work in the state costing $150,000 or more.[52]

One exception is training for people who are marginally attached to the workforce and who face considerable barriers to getting into work, such as the long-term unemployed. They are less likely to be engaged in work-related training, but there can be substantial long-term social benefits from training that enables them to find and retain work, through savings on government services, including unemployment payments.

As CEDA has previously argued,[53] training for hard-to-place job seekers should be further scaled up via wage subsidies and sectoral employment programs targeted at the needs of local unemployed people and employers, with a greater focus on long-term outcomes. This requires ongoing career coaching and case management, as well as monitoring and evaluation, to enable successful programs to be scaled up and less successful programs ended.

## Greater cooperation between businesses and training providers is needed

As the 2021 review of university-industry collaboration in teaching and learning pointed out, the different sectors and jurisdictions across Australia that share an interest in lifelong learning need to come together.

Higher education, vocational education and industry need to work together to develop workforce skills.

Cooperation offers benefits for organisations through access to the rigour and teaching skills that educational institutions can offer (Case study 2). This can be particularly important for smaller organisations that do not have the same capacity to roll-out learning internally. Employers need to take advantage of the opportunities from shorter, stackable and portable qualifications such as micro-credentials, by integrating these courses into the workplace.[54]

There is also an important role for governments to drive collaboration and enhance pathways and partnerships between higher education providers, vocational education and industry.[55] This includes through funding innovative initiatives such as the NSW Institutes of Applied Technology, a collaboration between TAFE NSW, industry, universities and supported by the Department of Education that offers a range of career-focused digital and construction micro-credentials. Governments should ensure the right incentives are in place for collaboration; commencing accreditation of work-related training with courses developed collaboratively, as discussed above, would sharpen these incentives by increasing the payoffs from accredited courses.[56]

## Conclusion, caveats and key areas for further work

The tangible benefits for organisations and workers we have identified, coupled with the structural shifts underway in the economy, present a strong case for greater adoption of work-related training.

These factors also highlight the need to build deeper understanding of where the strongest returns to training arise and how it can be most effectively delivered to provide the dynamic, agile and highly skilled workforce that Australia needs to meet future challenges and seize emerging opportunities.

The limitations we identify throughout this report highlight the scope for further research. In particular, research using firm-level data could provide information on a broader range of training types than those included in the HILDA survey and address whether training has been targeted towards employees already on a path to promotion. More broadly, key questions remain around:

1. What is driving the declining participation in work-related training in Australia?
2. Why has participation in work-related training increased in most European countries over the same period?
3. Has the decline in structured training coincided with an increase in unstructured training?
4. How do structured and unstructured training types interact with each other? Are they complements or substitutes?
5. How do the returns to training vary by the type of training? For example, how do the returns to compliance training compare with those of training to improve skills?
6. To what extent are high-performing employees selected to receive training? Are they overrepresented in the training types that offer the greatest benefits?
7. What share of the income benefits associated with training can be attributed to targeting of high-performing employees?
8. Which methods of recognising prior learning offer the greatest benefits for both organisations and workers?

Exploring these areas can help Australian organisations to unlock the full range of benefits promised by work-related training. This in turn will provide a sound evidence base for policies and practices that can maximise the return on investment in training and safeguard the adaptability of Australia's workforce.

## Appendix 1: List of organisations consulted

| Individual consultations | Questionnaire responses |
|---|---|
| Australian Unity | Australian Institute for Machine Learning, University of Adelaide |
| BuildSkills Australia | ATCO Australia |
| BUPA | Ausgrid |
| Construction Skills Queensland | Australian Energy Market Operator |
| Gilbert + Tobin | Aware Super |
| LinkedIn | Department of Transport and Main Roads Queensland |
| Minter Ellison | Department of Water and Environmental Regulation WA |
| SA Power Networks | Essential Services Commission of SA |
| SkillsIQ | Essential Services Commission Victoria |
| Telstra | The Fullerton Hotel Sydney |
| Universities Australia | Hastings Deering |
| Victoria University | Infrastructure NSW |
| Westpac | Maroondah City Council |
| **CEDA Migration and Skills Member Advisory Committee:** | Multicultural Australia |
| Australian Bureau of Statistics | Planning Ingenuity |
| Chartered Accountants Australia & New Zealand | Respect Victoria |
| Deakin University | SEC Newgate |
| Fragomen | Syngenta Australia |
| Randstad | UnitingSA |
| SkillsIQ | University of Technology Sydney |
| VETASSESS | Western Power |
| University of Western Australia | Woolworths |

## Appendix 2: CEDA member questionnaire

To better understand the opportunities from, and barriers to, work-related training, CEDA undertook a questionnaire of member organisations. The questionnaire was distributed to member contacts in learning and development roles and targeted at staff with an oversight of training across their whole organisation. Responses to the questionnaire were predominantly long-form written responses, providing a qualitative compliment to the quantitative analysis (Appendix 3).

### Key insights from the questionnaire

In a sample of predominantly large organisations (Table 2.1) most do not measure the return on investment from training.

    - Only 15% of respondents had a clear approach to measuring return on investment.
    - A further third of respondents partly measured returns, for example via staff retention or engagement.
- Time/workload (78% of organisations) and cost (37%) are the biggest barriers to delivery and take-up of training.
    - The most common ways that time is made for training is via 'staff discretion to fit within working hours' (89% of organisations) and 'included in rostered time' (59% of organisations).
- Employers need to build the capability of their employees or risk losing them.
    - An executive commitment is needed to value professional development and innovation.
    - Lack of funding for training can sometimes be due to the failure to account for redundancy costs if staff do not receive adequate training.
- Consistent recognition of skills/talent management is needed (for example, across the public sector).
- Training needs to be implemented in the workplace so it can be applied practically.
- Remote work has led to more online training, which if poorly designed can deliver little or no benefit.

**Table 2.1** Distribution of staffing numbers for questionnaire responses

| Number of staff | Number of completed responses |
|---|---|
| 10 to 100 | 4 |
| 100 to 1000 | 9 |
| 1000+ | 14 |

### Questions asked

1) What types of training do you offer to your staff?
    a. Compliance training, for example health and safety training
    b. Training to maintain professional/occupational standing
    c. Training to develop skills in current job
    d. Training to prepare for future jobs or promotion within the firm
    e. Help to get started in a job
    f. Training to develop more general workforce skills
2) How do you make time for training for staff?
    a. Included in rostered time
    b. Allowance made as a part of scheduling (e.g. allowance in billable hours)
    c. Staff discretion to fit within work hours
    d. During staff's own time

3) Why do you provide training to staff?
    a. To increase productivity
    b. To get better outcomes for customers
    c. To retain staff/provide career growth
    d. Compliance and regulatory requirements
4) Do you measure the return on investment from training, and if so how?
5) What are the key barriers to delivery and take-up of training?
6) What is needed from government policy and organisations/employers to get better outcomes from training?
7) Are there any examples from your organisation that you would like to share that could have wider applicability?
8) Have you adapted training to the increased prevalence of remote work since the pandemic, and if so how?
9) Are there any other points on work-related training that you would like to add?

## Appendix 3: Data used for quantitative analysis

**Disclaimer:**

This paper uses unit record data from Household, Income and Labour Dynamics in Australia (HILDA) Survey conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the author[s] and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners. DOI: https://doi.org/10.26193/R4IN30

### About the data

Data used in this report are from the Household Income and Labour Dynamics in Australia (HILDA) survey and the Australian Bureau of Statistics (ABS).

The HILDA survey is nationally representative and interviews the same people each year with a wide range of questions about their personal and professional lives. In wave seven, the survey introduced questions about work-related training, which we have used in this report. The questions and their phrasing are listed in Table 3.

We limit the sample to those aged 25-64, consistent with our focus on work-related training for those already in the labour force. We applied HILDA survey weights in accordance with the guidance set out in Summerfield et al. (2023) to account for the probability of selection and to keep results representative of the Australian population at large.[57] For descriptive statistics capturing a snapshot in time, we applied cross-sectional weights. For analyses that tracked outcomes for specific individuals over time, we applied longitudinal weights.

**Table 3.1 Work-related training variables and phrasing in the HILDA survey**

| Variable name | Question |
|---|---|
| jttrwrk | During the past 12 months, have you taken part in any education or training schemes, as part of your employment? |
| jtthrs | On average, how many hours each day did you spend on those courses? Please do not include breaks, lunch, or travel time. |
| jttnum | In total, how many different training courses did you attend in the last 12 months? |
| jttdays | During the last 12 months, on how many days did you attend training? |
| jttrcst | Have you contributed towards the cost of any of this training? For example, by paying course fees; purchasing materials and books, paying for travel and accommodation while attending a training course; or taking unpaid time off to attend a training course. |
| jttopot | I would now like to ask you about where and when these training courses were conducted. Were any of these conducted at some other place, but in your own time? |
| jttopwt | I would now like to ask you about where and when these training courses were conducted. Were any of these conducted at some other place during paid work time? |
| jttpeot | I would now like to ask you about where and when these training courses were conducted. Were any of these conducted at your place of employment, but in your own time? |

| | |
|---|---|
| jttpewt | I would now like to ask you about where and when these training courses were conducted. Were any of these conducted at your place of employment (or while on the job) during paid work time? |
| jttrdsg | Aim of this training – to develop your skills generally |
| jttrhgs | Aim of this training – to help you get started in your job |
| jttrhsc | Aim of this training – because of health/safety concerns |
| jttrisc | Aim of this training – to improve your skills in your current job |
| jttrmps | Aim of this training – to maintain professional statis and/or meet occupational standards |
| jttrna | Aim of this training – No answer |
| jttros | Aim of this training – other aims |
| jttrrf | Aim of this training - refused |
| jttrnsk | Did you acquire any new skills from any of this training? |
| vjttuse | To what extent do you think you could use the new skills you have acquired from any of this training if you got a new job with a different employer? Not at all? Only to a limited extent? To a moderate extent? To a great extent? Or to a very great extent? |

We also used the ABS Work-Related Training and Adult Learning, Australia data,[58] which was collected as part of the agency's Multipurpose Household Survey. It provides information about work-related training for 2013 and the 2016-17 and 2020-21 financial years.

## Appendix 4: Methods used for quantitative analysis

We applied five main techniques to arrive at the quantitative results in this report:

- Descriptive statistics to identify trends in training participation;
- A fixed effects regression to estimate the impact of training participation on incomes;
- A probit regression for identifying determinants of training participation;
- An event study that uses a matching approach to examine income growth dynamics before and after doing training; and
- A shift-share analysis to calculate the impact of the changing sectoral composition in the economy on training participation.

### Fixed effects regression

We employ a finite distributed lag model with a fixed effects specification to estimate the impact on incomes from participating in training.

The natural log of inflation-adjusted income was regressed on a set of explanatory variables and their lags, as set out in Blanden et al. (2020). The model can be expressed:

$$y_{it} = \beta_0 + \sum_{k=1}^{K} \beta_{t-k} TP_{it-k} + \beta_X \boldsymbol{X}_{it} + \varepsilon_{it}$$

Where $y_{it}$ is logged annual incomes, $\beta_0$ is the intercept, $TP$ is a series of variables indicating whether individual $i$ participated in training in time $t - k$ and $\beta_{t-k}$ is their corresponding coefficient estimate, $\boldsymbol{X}$ is a vector of time-varying individual characteristics, and $\beta_{\boldsymbol{X}}$ is a vector of corresponding coefficient estimates, and $\varepsilon$ is a person $i$ specific error term. The characteristics we included were years of experience and years of experience squared, an indicator for whether an individual had a health condition, state of residence, marital status, occupation and industry classifications. $K$ is the number of lags used in the model, which we set to 7 in accordance with the literature, which suggests using no more than 10.

This approach was preferred over a pooled OLS model to control for unobserved time-invariant individual characteristics that may influence both training participation and wages. The coefficients on training participation and its lags are reported in Table 4.1.

**Table 4.1 Coefficients for the impact of training participation on log incomes**

| Explanatory Variable | Estimate (Log wages) |
|---|---|
| Training Participant | 0.186*** |
| Training Participant (Lag 1) | 0.233*** |
| Training Participant (Lag 2) | 0.032* |
| Training Participant (Lag 3) | 0.048*** |
| Training Participant (Lag 4) | -0.004 |
| Training Participant (Lag 5) | 0.036** |
| Training Participant (Lag 6) | 0.040** |
| Training Participant (Lag 7) | 0.033* |

Note: * Significant at 5% level. ** Significant at 1% level. *** Significant at 0.1% level.

## Probit regression

We used a probit regression to analyse the impact of a range of individual characteristics on training participation.

We follow Coelli and Tabasso (2015), substituting training participation as a binary dependent variable in the place of enrolment in formal education in their model. The results of this regression are outlined in Table 4.2.

**Table 4.2 Results of probit regression on determinants of training participation**

| Explanatory Variable | Estimate | Explanatory Variable | Estimate |
|---|---|---|---|
| **Age Range (Reference Category: 25-34)** | | **Gender (Reference Category: Female)** | |
| 35-44 | 0 | Male | -0.02** |
| 45-54 | -0.01 | **Employment Status (Reference Category: Employed Full Time)** | |
| 55-64 | -0.02* | Employed Part Time | -0.09** |
| **Industry Classification (Reference Category: Retail Trade)** | | **Martital Status (Reference Category: Married or De Facto)** | |
| Accommodation and Food Services | -0.03 | Never married, Widowed, Divorced or Separated* | -0.02** |
| Administrative and Support Services | -0.03 | **Highest level of education (Reference Category: Year 11 and below)** | |
| Agriculture, Forestry and Fishing | -0.07*** | Year 12 | 0.03** |
| Arts and Recreation Services | 0.08** | Cert III or IV | 0.08*** |
| Construction | -0.02 | Grad diploma, grad certificate | 0.14*** |
| Education and Training | 0.21*** | Adv diploma, diploma | 0.09*** |
| Electricity, Gas, Water and Waste Services | 0.17*** | Bachelor or honours | 0.10*** |
| Financial and Insurance Services | 0.10*** | Postgrad - masters or doctorate | 0.09*** |
| Health Care and Social Assistance | 0.25*** | **Occupation (Reference Category: Managers)** | |
| Information Media and Telecommunications | 0.02 | Clerical and Administrative Workers | -0.05*** |
| Manufacturing | -0.02 | Community and Personal Service Workers | 0.13*** |
| Mining | 0.13*** | Labourers | -0.01 |
| Other services | 0.01 | Machinery Operators and Drivers | 0.02 |
| Professional, Scientific and Technical Services | 0.03 | Professionals | 0.07*** |
| Public Administration and Safety | 0.18*** | Sales Workers | 0.03 |
| Rental, Hiring and Real Estate Services | 0.07** | Technicians and Trade Workers | 0.02 |
| Transport, Postal and Warehousing | 0.04 | **Tenure in role** | 0.00 |
| Wholesale Trade | -0.05** | | |

Note: * Significant at 5% level. ** Significant at 1% level. *** Significant at 0.1% level.

## Event study

For the event study (Figure 11), we create balanced 5-year panels for each year of data to examine income dynamics two years prior and post the first year of training participation. We used data from 2007-2019, omitting years impacted by the COVID-19 pandemic (2020-2022).

To compare similar individuals who trained and did not train, we use a nearest-neighbour matching technique. We follow a similar approach to the probit regression and use a range of demographic characteristics to calculate propensity scores, which are the basis of the matching process.

We apply controls on the allowable distance between propensity scores to ensure high quality matches between the training and non-training groups. Because of small sample sizes, we use a 1:1 ratio for the matching process.

## Shift-share analysis

A shift-share analysis was used to identify the change in the share of employees participating in training between 2007 and 2022 that was caused by the change in the structure of the economy. This was done by calculating the economy-wide rate of training if the share of employment by industry had remained at 2007 levels.

Without any change in the structure of the economy, the decline in training rates would have been almost one-third larger, from 34 per cent in 2007 to 26 per cent in 2022 (Table 4.3). The rate of training instead remained higher at 28 per cent in 2022, because industries that have grown their share of national employment, such as health and education, have significantly higher rates of participation in training than those that have seen a falling share, such as retail trade and manufacturing.

**Table 4.3 The effect of changing industry structure on overall rates of training**

| | 2007 | | 2022 | | Contribution to economy-wide training, 2007 employment shares (percentage points) (E) = (B) × (C) |
|---|---|---|---|---|---|
| | Share training (A) | Share of employment (B) | Share training (C) | Share of employment (D) | |
| Retail Trade | 21% | 8% | 17% | 6% | 1.4 |
| Agriculture, Forestry and Fishing | 13% | 3% | 10% | 2% | 0.3 |
| Mining | 43% | 2% | 26% | 2% | 0.6 |
| Manufacturing | 24% | 10% | 17% | 7% | 1.6 |
| Electricity, Gas, Water and Waste Services | 56% | 1% | 21% | 1% | 0.2 |
| Construction | 24% | 7% | 16% | 8% | 1.1 |
| Wholesale Trade | 21% | 3% | 22% | 3% | 0.7 |
| Accommodation and Food Services | 30% | 4% | 12% | 3% | 0.5 |
| Transport, Postal and Warehousing | 27% | 6% | 19% | 6% | 1.1 |
| Information Media and Telecommunications | 26% | 3% | 20% | 1% | 0.6 |
| Financial and Insurance Services | 48% | 4% | 37% | 4% | 1.6 |
| Rental, Hiring and Real Estate Services | 41% | 2% | 18% | 2% | 0.3 |
| Professional, Scientific and Technical Services | 33% | 9% | 21% | 8% | 1.8 |
| Administrative and Support Services | 20% | 3% | 11% | 2% | 0.3 |
| Public Administration and Safety | 48% | 7% | 38% | 8% | 2.7 |
| Education and Training | 49% | 10% | 42% | 12% | 4.3 |
| Health Care and Social Assistance | 46% | 13% | 43% | 17% | 5.7 |
| Arts and Recreation Services | 33% | 1% | 34% | 2% | 0.5 |
| Other Services | 27% | 3% | 14% | 4% | 0.4 |
| **Total** | 34.0% | 100% | 27.8% | 100% | 25.9% |

*Note*: The rate of training that would have prevailed in 2022 (25.9%), had the industry mix remained the same as in 2007, is calculated by summing the percentage point contributions in column (E).

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