An Investment in Productivity and Inclusion:

The Economic and Social Benefits of the TAFE System

By Alison Pennington

Centre for Future Work at the Australia Institute

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Introduction and Summary

Australia currently faces its most significant economic challenge in many decades. COVID-19 has resulted in the shutdown of large segments of the economy and the destruction of hundreds of thousands of jobs. With private incomes collapsing, business confidence shattered and global supply chains disrupted, it will take many years to rebuild the economy and enable Australians to start working again to their full potential. There is no doubt that young workers will be hardest hit by high unemployment and underemployment in coming years.

Training will play a vital role in reorienting the economy after the pandemic, facilitating crisis-accelerated transitions across industries and supporting millions of workers (both new entrants to the labour force, and existing workers displaced by the pandemic and its after-effects) to prepare for future jobs. But Australia's vocational education and training (VET) system requires urgent rebuilding to ensure it can support new skills acquisition, job-creation, and opportunity – including for those segments of Australia's population hardest-hit by the crisis (such as young people, women, and workers in regional communities). Unfortunately, the VET sector enters this tumultuous period having already experienced a profound and multidimensional crisis from policy failures and fiscal mismanagement during previous years. These problems remain entrenched. Understanding where policy went wrong will be critical to ensuring that VET plays its proper role in a comprehensive public policy-led national reconstruction effort.

Enrolments in apprenticeships and traineeships had already collapsed after 2012. Current projections now predict a further 30% drop in new apprenticeships (with 130,000 fewer positions) resulting from the pandemic to 2023 (Mitchell Institute, 2020). Yet even as the number of apprentices contracts, employers report prolonged skills shortages in technical and trades occupations; meanwhile, the number of young people neither in education nor in work is exploding. Dramatic restructuring of the VET system from the 2000s, based on market-based delivery of programs underpinned by massive public subsidies paid to private providers, failed to create the stable, high-quality vocational education system that the economy needs so badly now. Private providers received enormous public subsidies, only to come and go—sometimes even collapsing mid-program, or leaving students with poor-quality credentials. At the same time, governments have dramatically cut funding to the longest-standing and most reliable national provider of VET education: Australia's once world-renowned Technical and Further Education (TAFE) institutes. Coordinated and effective ties between students, TAFE institutes, industry and employers have been undermined. Once-reliable vocational pathways have been deeply damaged.

In this report we present robust and up-to-date evidence on the broad economic benefits of the TAFE system to Australia's future economy. This report makes a new contribution to the study of the economic impacts of both VET broadly, and the TAFE system specifically, in Australia. We adopt a multidimensional approach to measuring the economic and wider social benefits of vocational education. Our cost-benefit methodology is guided both by a review of the extant literature, and by original research to identify and quantify the broad economic and social benefits of vocational education. To calculate the wide-ranging economic impacts and social benefits of the TAFE system, we use a range of quantitative data from multiple official sources—including the Australian Bureau of Statistics (ABS); the National Centre for Vocational Education Research (NCVER); the Commonwealth Department of Education and Training; the Commonwealth Department of Employment, Skills, Small and Family Business; and the Organisation for Economic Co-operation and Development (OECD).

Here are our key findings:

BENEFITS

Despite years of significant funding pressure and policy confusion, the TAFE system continues to make a strong and disproportionate economic and social contribution to the Australian economy. The economic and social benefits arising from the direct activity of TAFE institutes, and the highly-skilled higher-earning workforce that the system has helped develop, are substantial. As outlined below, our quantitative benefits assessment has been organised into four benefits 'streams': each capturing different ways in which the TAFE system interacts with, and impacts the economy. In addition, we consider wider social benefits that the TAFE system generates, but which are harder to quantify.

The Economic Footprint of the TAFE System

The direct operation of TAFE institutes produces about $3 billion per year in additional value-added in Australia, including around $2.3 billion in wages, salaries and other employment benefits paid annually. Purchases and supply chain inputs associated with TAFEs extend and multiply this impact on the broader national and regional economies, generating another $1.6 billion per year in 'upstream' economic benefits. Counting the indirect jobs supported in the TAFE supply chain, a total of $3 billion in employment incomes is generated by TAFE institutes each year. In turn, that income translates into an additional $1.5 billion in incremental consumer spending on Australian-made goods and services. Including the direct activity of the TAFEs, its supply chain, and 'downstream' consumer spending impacts, we estimate that a total of over $6 billion in economic activity, supporting 48,000 positions (directly and indirectly), is generated by the presence and activity of Australia's TAFE institutes.

Increased Earnings and Productivity

Students who complete VET qualifications with TAFE institutes move into the labour force with skills that generate higher earnings compared to the earnings of workers without post-school qualifications. Employees and owner-managers with VET qualifications (including Certificate I/II/III/IV, Diploma and Advanced Diploma) receive a wage premium of 39% compared with those whose highest educational attainment is Year 12 or below.

In addition, a more skilled workforce yields significant productivity benefits to employers, as well as higher tax revenues for government. The total annual benefit that the TAFE system generates thanks to its accumulated contribution to the skills of Australians is estimated at $84.9 billion. Some of this is paid in higher incomes to workers; some of it is captured in higher profits by employers. And some of it is paid in incremental taxation revenues to government, which we estimate are worth $25 billion per year—several times more than governments currently allocate to the cost of running the entire TAFE system.

Stronger Employment Outcomes

After training, TAFE graduates are more likely to be employed, and less likely to be unemployed, than workers with less training. Moreover, with increased access to skilled workers, industry can expand production and employ more people, increasing total output across the economy. We estimate the TAFE system has increased the employability of the VET-educated population, relative to those without post-school education, resulting in an increase in employment of around 486,000 positions.

Reduced Fiscal Outlays

The TAFE system increases employability, thereby lowering unemployment and supporting a healthier workforce and society. An important consequence of this is reduced social assistance and public healthcare expenditures. We estimate the annual value of reduced social expenses at some $1.5 billion per year.

Combined Benefits

Table 1 provides a summary of the annual impacts of TAFE across these key economic indicators. The total annual benefit (driven by the accumulated historic investment in the TAFE-trained workforce) is estimated at $92.5 billion. That represents around 4.5% of Australian GDP. Those benefits can be traced back to the extra employability, productivity and incomes (and associated savings on social benefit costs) demonstrated by the TAFE-educated workforce.

Table 1 TAFE Annual Economic Impact Results	
TAFE Economic Footprint	$6.1 billion
Higher Earnings and Productivity (Includes Higher Tax Revenues)	$84.9 billion ($25 billion)
Fiscal Savings (Social Benefits)	$1.5 billion
Total Benefit	**$92.5 billion**
Total Annual Costs	$5.7 billion

Wider Social Benefits

The substantial economic benefits supported by the TAFE system, quantified in Table 1, do not tell the whole story about the importance of TAFEs to our all-round economic and social well-being. The TAFE system also underpins a wide range of broader social benefits that are harder to quantify. For example, TAFEs promote stronger economic and labour market outcomes in regional areas. They help 'bridge' access to further education and jobs pathways for special and at-risk groups of young Australians. They ensure greater social cohesion, and help to reduce crime. TAFE students are more likely to come from the lowest quintile of society according to socio-economic disadvantage,[1] more likely to be Aboriginal or Torres Strait Islander, and more likely to identify as having a disability compared with students of private VET providers or universities. All these features confirm that TAFEs are critically important in addressing systemic inequality in Australia's economy and society.

COSTS

The costs of operating the TAFE system accrue to governments, students and employers in the delivery of vocational education through TAFE institutes. Compared to the preceding inventory of direct and indirect economic and social benefits, the costs of operating the TAFE system are modest by any measure. We estimate the combined costs of the TAFE system—including government funding for training and administration, employer and student assistance, loans and income support payments, student fees, and employer apprenticeship and traineeship training costs—at $5.7 billion per year. That represents only about 0.3% of Australia's GDP.

[1] NCVER statistics measure disadvantage among VET and university students according to the ABS Index of Relative Socio-economic Disadvantage (IRSD). IRSD is a socio-economic index that summarises a range of indicators about the economic and social conditions of individuals and households within an area, including income and educational attainment. Low quintile scores indicate greater disadvantage relative to higher quintiles (NCVER, 2020).

COST-BENEFIT COMPARISONS

The TAFE system has made a leading, decades-long contribution to training and skills in the Australian economy. On the basis of historical enrolment data, we estimate that 72.5% of Australian workers currently holding VET qualifications received their training through the TAFE system. Hence, Australia's historic investment in quality public vocational education generates an enormous and ongoing dividend, in the form of the enhanced productivity, higher earnings, increased tax payments, and reduced social benefit costs associated with those workers. This is a valuable and continuing payoff to the funds that were invested in TAFEs: both now and in the past.

There is no doubt that the benefits of TAFE education to individuals, employers, the government and wider society far outweigh the costs. As noted, the combined annual costs for operating the TAFE system's 35 institutes were modest—$5.7 billion. In contrast, the annual economic benefits generated thanks to investments in TAFE-provided training were estimated at $92.5 billion. In other words, the flow of annual benefits resulting from the present and past operation of the TAFE system exceed the current annual costs of operating that system by a factor of 16 times.

Keep in mind that the flow of these economic benefits resulting from a better-skilled workforce is the legacy of Australia's historic commitment to high-quality public vocational education. But that commitment has been undermined in recent years by reductions in fiscal support for public VET, and failed policy experiments with privatised, market-delivered, but publicly-subsidised VET programs. As a result, the flow of economic benefits generated by well-trained, better-paid VET graduates is in jeopardy today. Australia is not replacing its stock of high-quality TAFE graduates – which means that over time, that flow of economic benefits will inevitably decline. Reported problems encountered by many industries and employers in recruiting and retaining adequately-skilled workers in numerous occupations attests to the growing costs of Australia's underinvestment in reliable, publicly-delivered VET.

A fitting analogy can be drawn to other long-term investments that deliver an ongoing flow of benefits – but which must be adequately maintained if that flow of benefits is to continue. Imagine a well-built house: it generates value each year that someone lives in it. But if the house is not maintained, and its structural integrity assured, then that flow of benefits will quickly erode. Australia's economy today is reaping an enormous flow of economic benefits from a 'house' that was built by our TAFE system: $92.5 billion in annual productivity, income, tax, and social benefits. But the TAFEs today have been structurally damaged by neglect and outright policy vandalism. If we want to continue reaping those benefits of a superior productive TAFE-trained workforce, we must repair that damage – and quickly. With the COVID-19 pandemic ushering in an era of unprecedented disruption and transition, this is the moment to strengthen Australia's investments in the TAFE system.

We can make our vocational training system once again the envy of the world, and ensure that our economy, our communities, and our governments continue to reap the benefits of a productive, well-trained workforce.

POLICY IMPLICATIONS

Australia desperately needs a thorough overhaul of VET sector policy, and a lasting commitment to repairing a badly-damaged VET system. As the economy staggers in the face of the COVID-19 pandemic and resulting global recession, we need expanded access to VET education, stronger pathways from training to work, and a more cohesive and coordinated post-school education system. Revitalised TAFE institutes, as the most reliable 'anchors' of vocational training, must be at the centre of that reconstruction process.

There is a fitting historical analogy for the present imperative to repair our VET system, starting with the TAFEs. After the Second World War, Australia launched a coordinated national training strategy, as a key part of a National Reconstruction Plan aimed at ensuring returning soldiers would have productive employment opportunities – and making sure the economy did not slip back into a stubborn depression.[2] We need a similarly comprehensive national strategy for skills and training today, starting with the urgent restoration of public funds to the most experienced, reliable and high-quality, national-level, vocational training provider in Australia: the TAFE system.

Our findings suggest there is strong economic rationale for strengthening and expanding VET access for young, at-risk groups, and for all workers who lack post-school qualifications. Australia will squander the demonstrated and ongoing economic benefits generated by our investments in TAFE institutes, and unduly limit our post-COVID reconstruction opportunities, if we do not act quickly to reinstate the funding and critical role that TAFE plays in the VET system.

OVERVIEW OF THIS PAPER

The remainder of this paper is organised as follows. First, we review the history of underfunding and failed market-based policies that have left Australia's VET system in such poor shape to respond to the crisis of the pandemic and resulting recession. The next section then discusses how this legacy of policy failure has left the VET system poorly prepared to confront the unprecedented labour market challenges arising from the COVID-

[2] The National Reconstruction Plan was launched by the Commonwealth Government in 1942, years before the eventual cessation of hostilities, and featured several complementary elements: including building national manufacturing and infrastructure, extending public education and vocational training, expansionary macro-economic policies, and a commitment to full employment. For more on Australia's experience with 1940s reconstruction, see MacIntyre (2015).

19 pandemic and associated recession. The following section reviews the methodology and findings of other published research, which has also attempted to analyse the costs and benefits of public and social programs. The next sections of the report review and quantify the benefits and costs associated with the TAFE system in detail, broken into various categories and components. The benefits include the direct economic injections resulting from the operation of TAFE institutes, the superior productivity and income flows resulting from the TAFE-trained workforce, and the broader (often non-quantifiable) social benefits produced thanks to a more accessible public training system. The costs include expenses of operating the TAFE system allocated to governments, students, and employers. After comparing these costs and benefits of the TAFE system, the final section provides a concluding discussion of policy implications arising from these findings. A technical appendix provides more details regarding several of the methodological issues confronted in the cost-benefit analysis.

The Crisis of Australian VET Policy

Strong vocational education and training (VET) systems are vital to the success of dynamic, innovative economies and inclusive labour markets. Australia's VET system once provided well-established and dependable education-to-jobs pathways, but a combination of policy mistakes and fiscal mismanagement plunged the VET system into a lasting and multidimensional crisis. A recent index comparing education systems and labour market outcomes across 80 countries ranked Australia's VET system, once the envy of the world, as 20th. For mid-level skills capability, the ranking was even lower: 38th in the world (Lanvin & Monteivo, 2020).[3]

Multiple policy failures produced this outcome:

- Both state/territory and Commonwealth levels of governments have failed to provide adequate long-term fiscal support to vocational training, with post-secondary education expenditures increasingly focused on the university sector.
- A policy experiment in establishing a 'contestable market' for vocational education services that decentralised offerings, course delivery and student recruitment to unaccountable for-profit training providers also failed. Poor-quality programs and providers proliferated, with the result that VET skills coordination and planning is in disarray.
- Enormous public subsidies for private VET providers were introduced under the poorly controlled VET FEE-HELP loans system—introduced first in 2007, and then expanded in 2012 through demand-driven arrangements. The VET FEE-HELP loans regime wasted public resources, and spurred unethical and unproductive practices in the for-profit VET system. At the same time that up-front fees for VET courses were introduced, Commonwealth funding for university enrolments was uncapped. When coupled with the existing HECS-HELP regime (which allows for full fee deferral), vocational education was effectively discouraged—even for those students for whom vocational education was better aligned with their skills and interests. The unequal funding treatment between post-secondary funding regimes continues to distort higher education decision-making by young Australians.
- Despite the government's own 2016 review into VET, which recommended fee caps and tighter regulation (Department of Education and Training, 2016), the Productivity Commission's (2020b) interim report on national VET reforms

[3] Other indications of access and mobility problems in Australia's education-to-jobs system are low rankings for matching labour market demand to workforce supply (ranked 17th), the provision of lifelong learning (14th), and access to growth opportunities (14th).

responding to the COVID-19 crisis has worryingly recommended the same policies that landed the sector in hot water before the pandemic. Measures recommended by the Productivity Commission include uncapping fees, expanding access to student income-contingent loans, and replacing direct public subsidies to providers with a student voucher system. These policies would reinforce the failure of previous market-driven models.

- While experimenting in marketisation, most state/territory governments and the Commonwealth Government ruthlessly cut the budgets of the public TAFE system—Australia's longest-standing, quality, publicly accountable core provider of vocational education. Consequently, the TAFE system's vital 'anchor' function as a high-quality public institution – working in cooperation with industries, and embedded in communities – is in jeopardy.

REDUCED ENROLMENTS

After a short-lived surge in enrolments once VET FEE-HELP was extended across the sector, program enrolments in vocational training (including apprenticeships and traineeships) have fallen sharply. Eligibility criteria and oversight were tightened in 2015–16 in response to numerous scandals (and VET FEE-HELP was replaced by the new VET Student Loans Scheme[4]). However, without any corresponding commitment to resource more genuine VET streams as alternatives to dodgy for-profit providers, this only reinforced the enrolment decline.

This failure to seize the opportunity to repair the damage of marketisation during the 2015–16 government VET review has seen the number of program enrolments begin to decline precipitously – and that decline has accelerated during the COVID-19 pandemic. Table 2 shows that program enrolments across the total VET sector declined by around 450,000 between 2015 and 2018. By number of enrolments, the decline has been highest for private training providers and for TAFE institutes; but as a proportion of previous enrolments, the decline has been experienced broadly across most providers. TAFE institutes broadly maintained their 32% share of all VET enrolments from 2015 through 2018.

[4] The Commonwealth Government implemented the VET Student Loans program on 1 January 2017, replacing the existing VET FEE-HELP scheme for new students. The new VET Student Loans provide eligible students with an income-contingent loan to pay their tuition fees for VET qualifications at the Diploma level and above. Like university HECS loans, students are only required to repay loans when their income after graduation exceeds a minimum threshold.

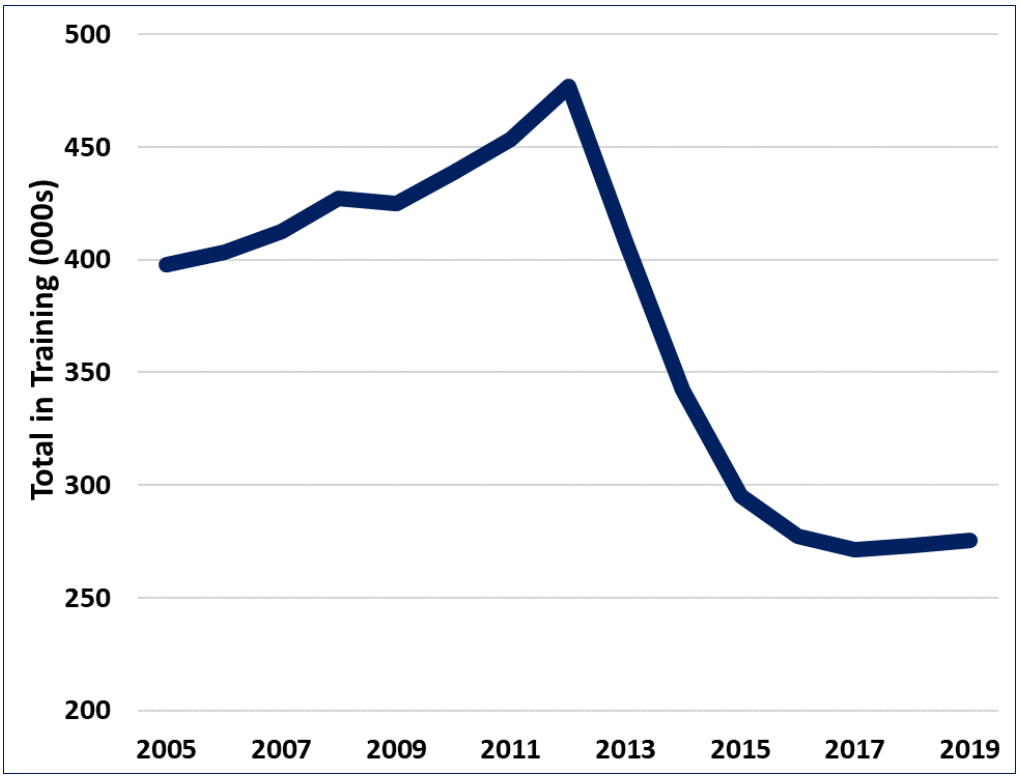
Table 2 Program Enrolments by VET Provider (2015–18)				
Provider Type	**2018**	**Change 2015–18**	**% of all Enrolments 2015**	**% of all Enrolments 2018**
Private Training Providers	1,391,359	–260,592	54%	53%
TAFE Institutes	833,134	–155,806	32%	32%
Enterprise Providers	83,851	–2618	3%	3%
Community Education Providers	102,488	+845	3%	4%
Schools	144,090	–32,135	6%	5%
Universities	67,602	–7148	2%	3%
Total	**2,622,523**	**–457,455**	**100%**	**100%**
Source: NCVER, 2018.				

Apprenticeship and traineeship positions have been another casualty of the Australian VET system crisis—falling dramatically since 2012. Figure 1 shows that the number of apprentices and trainees in training plunged by almost half after 2012, to just 275,000 in 2017. That decline levelled off and recovered just slightly; but there were only 5000 additional apprentices and trainees in training by June 2019. However, even that modest growth was subsequently lost because of the severe impacts of the coronavirus crisis on employment and recruitment. The Mitchell Institute (2020) predicts a further 30% drop in new apprenticeships (representing a further decline of 130,000 fewer apprenticeships) from the virus shutdowns through to 2023. That comes on top of the pre-pandemic decline of more than 200,000 apprentices and trainees removed from the skills pipeline compared with 2012 levels. If the Mitchell Institute forecast is realised, total apprenticeship and traineeship numbers will have declined by 70% since 2012.

Since the TAFE system is the dominant provider of apprenticeships and traineeships—delivering around half of all government-funded programs in 2018[5]—it is not a coincidence that Australia's crisis in apprenticeship numbers has coincided with funding cuts to TAFE. Apprenticeships require long-term investment and commitment from both the apprentice and the employer. The OECD (2010, p. 49) acknowledges that this relationship is best established through public funding arrangements, since VET skills yield wide returns to employers and the economy, and pure market models cannot adequately reflect these returns in course fees to students. As a result, without public funding all actors suffer through under-provision of skills.

[5] 'Government-funded programs' refers to all Commonwealth and state/territory government-funded training delivered by technical and further education (TAFE) institutes, as well as by other government providers (including universities), community education providers and private training providers.

Figure 1. Total Apprentices and Trainees in Training, 2005–19.

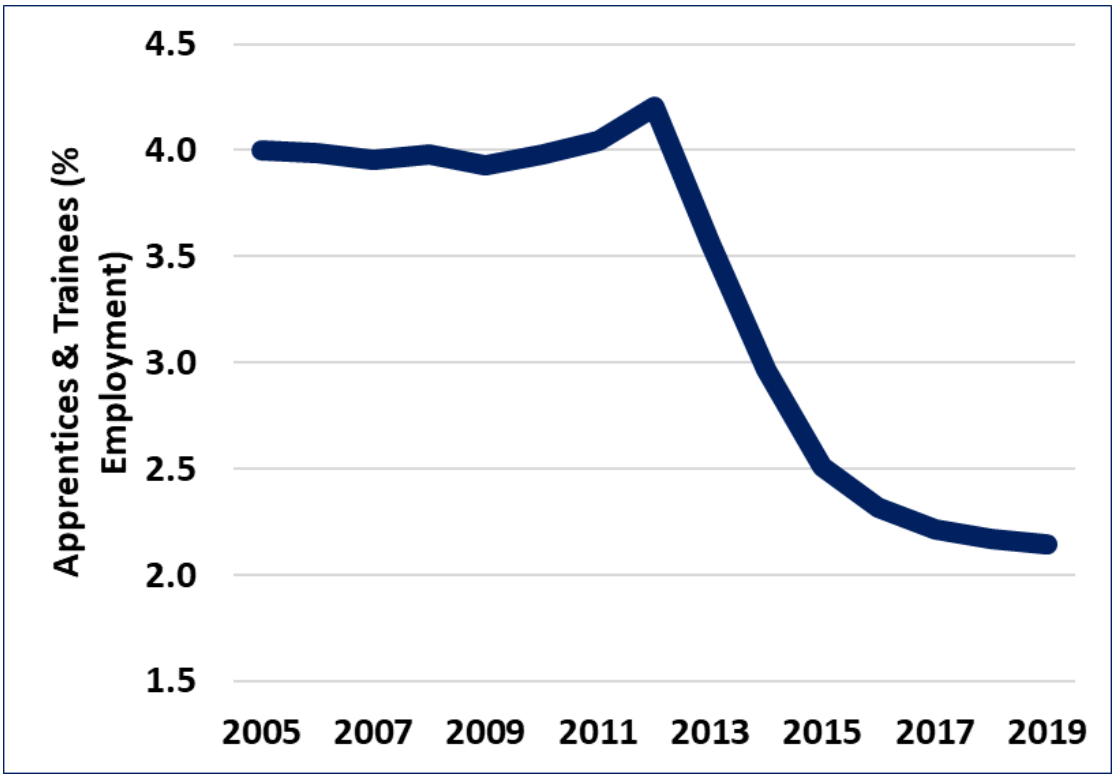


Source: NCVER, *Apprentices and Trainees* (June 2019). Annual averages.

Indeed, the establishment of private market principles for VET delivery and the VET FEE-HELP scheme increased both the cost of education for individuals (many of whom could not afford the new fees) and the employer risk (and costs) of investing long-term in their future workforce. This retreat of government from vocational skills and training has reinforced limited-horizon, more apprehensive attitudes among employers, who now invest less in workforce training and skills—particularly given the context of increased competition and access to an abundant supply of underutilised labour. An Australian Industry Group (AiG 2018) survey of firms employing a total of over 110,000 employees found that only half these firms planned to increase training expenditure in future years. The same survey reported that employers are facing stubborn skills shortages, particularly in trades and technicians.

Decline in VET training programs has occurred alongside continued growth in the overall workforce—and the associated demand to expand training provision. Expressed as a share of total employment, the decline in apprentices and trainees in training has been even more severe. Figure 2 illustrates the decline in the overall rate of vocational education undertaken across the Australian economy from 2012 to 2019 (before the pandemic struck). In 2019, total participation in apprenticeships and traineeships represented only 2.1% of Australian employment—just half the 2012 rate. This constitutes one of the weakest vocational education participation rates of any industrial country.

Figure 2. Apprentice and Trainee Training Rate, 2005–19.



Source: Author's calculations from NCVER, *Apprentices and Trainees* (June 2019) and ABS Catalogue 6202.0. Annual averages.

REDUCED FUNDING

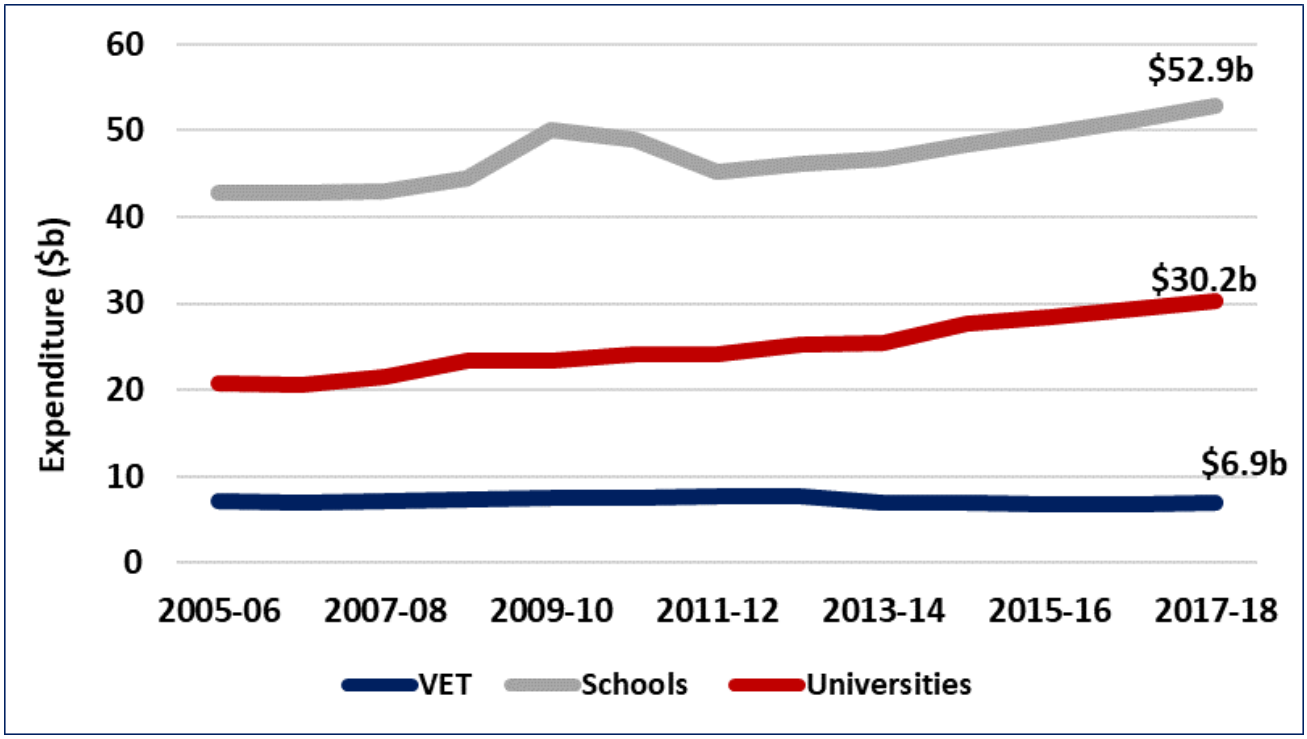
The combination of reduced funding for public VET education and the introduction of VET FEE-HELP triggered a damaging cycle of cumulative causation: reduced enrolments allowed government to further cut funding, thereby both reducing course offerings and the quality of vocational training, which further reduced the standing of the TAFE system among students and employers, and discouraged enrolments even further.

Figure 3 presents ABS annual data on government spending by education sector for the financial years 2005–06 to 2017–18. [6] The data provide total operating expenditure on education and training by Commonwealth and state/territory governments, and

[6] Data for the last four financial years from ABS 5518.0.55.001 provide government expenditure figures under the following classifications: 'school', 'tertiary' and 'other education' only. The VET and university sectors are combined under 'tertiary education'. We calculate a proxy for VET expenditure from the 'Control n.f.d.' sector which represents expenditure on public universities (e.g. tertiary education – Control n.f.d = VET). However, this figure does not include state–Commonwealth consolidations. This may explain why our final funding figures are higher than those reported in other studies utilising the same ABS catalogue (e.g. Pilcher and Torii, 2017). In addition, we report figures in real 2017–18 (Australian) dollars. Nominal data have been converted to real terms using the ABS State and Local Government Final Consumption deflator.

expenditure of public entities including government schools, TAFE institutes and public universities. All spending from public funds by private providers is included.

Figure 3. Real Government Funding by Sector (2005/6 to 2017/18).



Source: Author's calculations from ABS Catalogue 5518.055.001, Table 2. Figures adjusted to 2018 dollars.

The figures show that government VET spending has languished far below funding for schools and universities over the last decade, declining by 1% in real terms since 2005–06 to only $6.9 billion in 2017–18. Over the same period, real spending on primary and secondary schools increased by 23% from $42.7 billion to $52.9 billion—consistent with the growth in everyday operating costs due to both increasing student numbers and improved per capita spending (Pilcher & Torii, 2017). Meanwhile, government expenditure on universities increased the most of all education sectors, with a total $30.2 billion spent in 2017–18—more than 45% above 2005–06 levels (in real terms). University spending growth escalated from 2012, when the government introduced uncapped funding based on enrolments—the same year that the VET FEE-HELP loans system was introduced. These contradictory policies have led to stark funding divergences between VET providers and universities, reflecting the failure of policy makers to create a more coherent and balanced tertiary education system.

Calculating total government expenditure per enrolment by sector paints an even starker picture of funding inequities between universities and VET providers in tertiary education (as indicated in Table 3). Government spends just $6,479 per year per full-time equivalent

(FTE) VET enrolment, compared to $40,495 per year per FTE enrolment for universities,[7] and $13,574 per year for each primary and secondary school enrolment. This gross imbalance in government funding to VET hinders Australia's ability to deliver high-quality vocational education and to prepare for future jobs.

Table 3
Government Funding Per Enrolment by Sector (FTE) (2017/18)

	Total FTE Enrolments	Funding Per FTE Enrolment ($)
VET	1,070,735	$6,479
Schools	3,893,834	$13,574
University	746,093	$40,495

Source: Author's calculations from ABS Catalogues 5518.0.55.001, Table 2, and 4221.0; Department of Education and Training, uCube; NCVER, *Total VET Students and Courses*.
School enrolments combine government, catholic and private schools.

TAFE SYSTEM ERODED

The past decade of failed policy experimentation in VET delivery has decimated the TAFE system. The number of TAFE providers has been cut by almost 40% within the last five years alone—only 35 TAFE providers remain nationally.[8] TAFE institutes once functioned as 'anchors' of the VET system: a network of stable, well-funded, publicly accountable and trusted institutions that provided a full range of vocational courses (including course offerings considered too unprofitable to deliver in the private sector). The TAFE system oversaw most apprenticeships, and it innovated new curriculums and teaching methods. In 1996, 83% of students undertaking publicly funded VET were registered at TAFE institutes (NCVER, 2018).

In contrast, from the late 1990s, Australia began instituting training market-oriented policies to complement the wider neoliberal push for labour market deregulation. The introduction of the 'User Choice' policy in 1998 marked the official emergence of a newly minted market system for VET (Toner, 2018), whereby TAFE institutes were supposed to compete with private providers on the 'same ground' for (publicly subsidised) student dollars. In 2008, Australian governments made all public VET funding 'contestable'. Numerous systems were

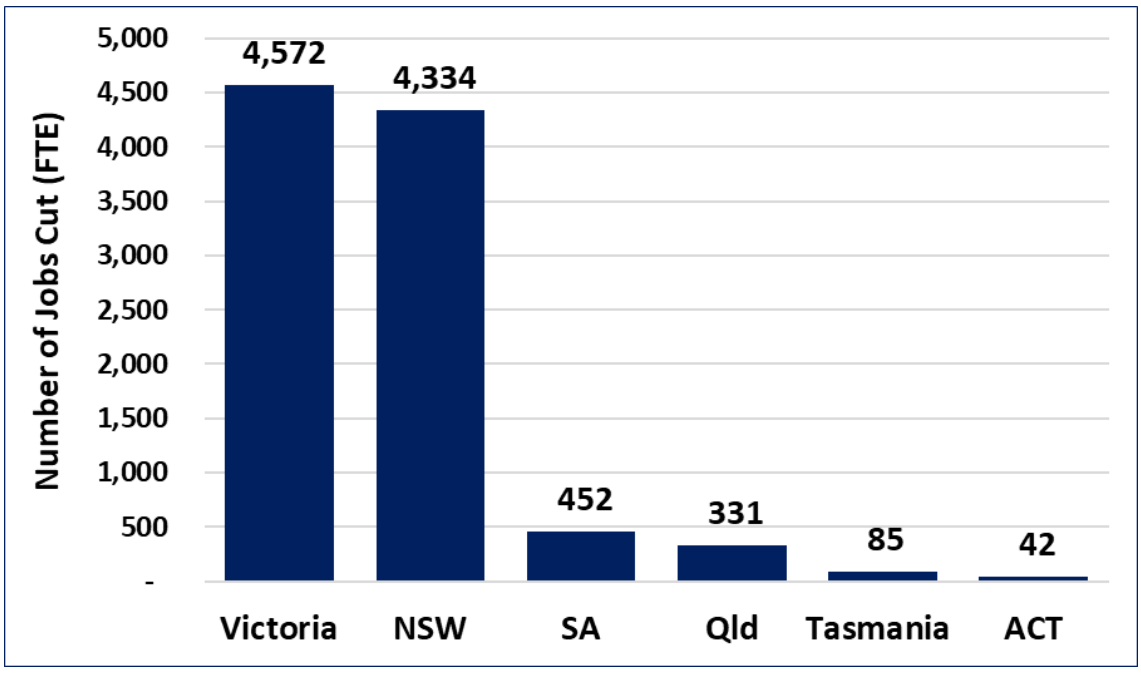
[7] Government spending per FTE university enrolment has not been adjusted for HECS loan repayment.

[8] The number of TAFE providers nationally has declined from 53 in 2014, to only 35 in 2018 – a 39% reduction in TAFE institutes (Table 5A.7; Productivity Commission, 2020a).

introduced to price and allocate public training funds, including tendering processes, voucher systems and uncapped pricing under the VET FEE-HELP scheme.

However, decades of delivering a full infrastructure of public vocational education left the TAFE system with ongoing fixed and operating costs that private providers did not incur (including infrastructure, capital projects and the maintenance of industry and schools partnerships). Some private providers developed gimmicky marketing schemes (for example, offering 'free' iPads for new students that were, of course, hidden within tuition costs), and poorly designed and delivered courses proliferated nationally. TAFE institutes were stranded, while public resources flowed to private VET provision. This forced the cash-strapped TAFE system to pare back offerings, further undermining its standing among students and employers as a reputable and stable skills provider. By 2018, only 61% of government-funded VET students were enrolled in TAFE institutes (NCVER, 2018). Wheelahan (2018) reports that the total hours of training offered by TAFE institutes nationally fell by 30% between 2009 and 2016, compared with a near-doubling of hours provided by private providers over the same period.

Figure 4. Reductions in TAFE Staff Levels by State 2012–19 (FTE).



Source: Author's calculations from various consolidated TAFE annual reports and state education system workforce profiles. Due to restricted data availability, starting point for Tasmania and Qld is 2014, and 2013 for SA. All other jurisdictions from 2012. 2018 latest data available for Victoria and ACT. No state-wide data available for WA and NT.

Alongside these falling enrolments and budget cuts, staffing levels in the TAFE system have fallen sharply. As illustrated in Figure 4, almost 10,000 FTE TAFE positions have been cut

since 2012 across six states and territories.[9] The two largest TAFE systems—Victoria and NSW—have been the worst hit, with nearly 9000 FTE positions cut just from these states. Not surprisingly, an environment of job cuts and restricted funding leads to increased pressures on TAFE employees. A recent survey of TAFE employees by the Australian Education Union (2020) confirmed increasing workload pressures across all teaching levels. The average TAFE institute teacher is now performing an additional day of work per week unpaid; and 93% of respondents reported that the pace or intensity of their work had increased since 2016.

[9] Figure 4 includes those 6 states and territories which publish TAFE workforce data.

The COVID Recession, Jobs and Skills

The retreat of public-funded VET will make it all the harder for Australia's labour market to respond to the major employment shocks precipitated by the COVID-19 pandemic. Deliberate shutdowns of large sections of the economy to protect public health have caused an unprecedented economic crisis. The resulting economic contraction is faster and deeper than the Depression of the 1930s, with falling employment, GDP, incomes and tax revenues.

The pandemic has certainly shocked the labour market, with true unemployment rising far beyond what official ABS figures indicate. Official unemployment rose to above 7% in the first months of the recession—a very serious level. However, if we include those who were 'employed' but who did not work any hours, those who did not actively seek work (and thus were considered outside of the labour force), and the equivalent loss of jobs resulting from the steep decline in average hours lost across the workforce (on a FTE basis), an effective unemployment rate of around 20% is indicated.[10]

Young workers have been hardest hit by the shutdowns, due to their heavy employment in vulnerable customer-facing service sectors like retail, hospitality and personal services. Between March and April 2020, hours lost for young workers aged 15–24 were double that of older age groups, and their participation rate declined by 6% compared to 2% for workers aged 25–54 (Borland, 2020). But employment outcomes had already been worsening for young workers since the GFC. More than 600,000 people aged 15–24 were not 'fully engaged' in either employment or education in 2019 (defined as being either in full-time education or employment or in part-time combinations of both). This is an increase of over 130,000 from 2007.[11] Earnings lost from young people's time out of employment, education or training are estimated at 1% of GDP (or over $16 billion per year in 2016; OECD, 2016).

The pandemic will only increase youth dislocation. Through failure to harness a generation brimming with skills and capacity, COVID-19 will also increase the costs of long-term youth unemployment on young people's lives, their families and the wider economy. Despite the dire need for sustained public investment to generate jobs in the crisis, the Commonwealth Government has yet to commit to any generalised or targeted long-term jobs-generating measures.

Another major trend impacting skills and employment, and that will be accelerated by the pandemic, is the rapid change in the composition of Australia's business community. Recent years have witnessed the loss of thousands of medium and large firms. ABS firm data show that there are 20,000 fewer medium-sized firms (employing 20–199 people), and over 2000

[10] Author's calculations from ABS Catalogue 6202.0.

[11] From ABS Catalogue 6227.0.

fewer large firms (employing more than 200 people), than there were 15 years ago.[12] Meanwhile, more than 5,000 small firms employing less than 20 people, and an astonishing 200,000 micro-firms employing less than five people were created over the same period. Investment in skills, new capital formation and innovation are all very low in small firms, since they lack the financial resources and the economies of scale required to invest in long-term workforce planning. This is why small firms are typically unlikely to have dedicated training staff of their own (Hawke, 1998), and hence are especially dependent on the training services provided through a public system. A smaller and weaker TAFE system will not be able to address the increasingly inadequate training capabilities of Australia's growing community of very small businesses.

In sum, the Australian labour market faces a challenging period of structural change in the years ahead, made all the more treacherous because of the uncertainty regarding continuation of emergency income supports and wage subsidies (like JobSeeker and JobKeeper). These structural changes demand institutions that can assist the gathering of industry-level information on skills demands, as well as deliver training to assist in labour (re)allocation as the economy tries to regain its footing after the pandemic. The federal government's independent National Skills Commission (NSC) established in June to forecast jobs and skills in rapidly evolving conditions is mandated to address the present dearth of labour market planning tools operating at the federal level. But initial indications from government (including its 'JobTrainer' program announced in July) suggest that it still refuses to acknowledge the central role of public VET services, and TAFE in particular, in improving Australia's skills system. Indeed, the Prime Minister's announcement of the new $2 billion program did not even mention TAFE, and is likely to reinforce the flow of public monies into private VET providers.[13]

However, government has an historic opportunity in this pandemic to strengthen skills–jobs planning by building on the essential role that TAFE institutes already play in labour market planning and coordination. In each state, TAFE institutes work collaboratively with government, industry and other educational institutions (including schools and universities) to forecast future skills needs and to align program offerings to meet that demand. Collaborative and flexible linkages are driven by the TAFE system's public commitment to skills and education, and these linkages can support government both to deliver on its investments and to support employers by nurturing job clusters aligned to identified growth areas in Australia's recovery.

[12] Author's calculations from ABS 8165.0 Counts of Australian Businesses, including Entries and Exits. Table 13.
[13] Prime Minister of Australia (2020).

Review of Published Research

Economic Benefits of TAFE Institutes

There are no existing studies on the national economic impacts of the TAFE system. KPMG (2018a, 2018b) has measured the benefits of TAFE institutes at the level of individual state economies (Queensland and Victoria). Our study is the first national study to include the Commonwealth costs and benefits of delivering TAFE, and to include the impacts of TAFE for federal revenues and fiscal outlays for welfare and public healthcare.

KPMG's Queensland TAFE study uses general equilibrium modelling to measure the economy-wide impacts of TAFE operations. The study identifies several key economic benefits from the TAFE system, including a wage premium to people with TAFE qualifications of $529 million,[14] improved employment outcomes worth $600 million, and international exports (purchased by foreign TAFE students) of $134 million (all figures annual). KPMG find that for an investment of $707 million in TAFE Queensland in 2017, the total economic value realised to the state's economy was some $1.8 billion. Hence, for every $1 spent, a total of $2.55 value-added is created.

KPMG use the same methodology for a parallel study of the social and economic benefits of the Victorian TAFE system. They find that Victoria's TAFE institutes generated $2.9 billion per annum in Gross State Product (GSP) from higher workforce participation and earnings, along with additional economic demand generated by these improved labour market outcomes, by the TAFE system's direct operations, and by international export contributions. For every $1 spent on Victorian TAFE, the TAFE institutes returned $2.19 to the state economy.

Cost-benefit studies for vocational education and other education systems

A range of cost-benefit studies have considered the economic impacts of broader education systems. For example, Birch et al. (2003) conduct a comprehensive cost-benefit study of the adult and community education sector in Australia. They adopt a human capital model to develop estimates of economic impacts on individuals (including, for example, course fees and deferred earnings) and on communities (for example, income to the sector's providers,

[14] It should be noted here that the KPMG methodology uses a different approach to estimating the value of higher wages resulting from TAFE training, from the one we utilise in the discussion below. The KPMG model estimates the value of higher wages accruing only to those workers who graduate TAFE in the specific reference year considered, in order to generate a flow of benefits that can be associated strictly with the costs invested in TAFE for that same year, and thus calculate a return on that year's public investment. In contrast, we measure the aggregate annual wage benefits resulting from the historic accumulation of TAFE-provided skills in the workforce at the present time; this flow of benefits is much larger than the narrower conception considered by KPMG.

wages and salaries, additional tax revenues). Three scenarios are adopted, with the 'most likely' returning net community and private labour market benefits exceeding $3 billion.

Multiple studies of early childhood education demonstrate the net economic benefits of investing in public childcare. These studies develop additional bridging steps in their methods to trace capabilities developed through education in early years through to higher education (and then the workforce). PwC on behalf of The Front Project (2019) has conducted the most comprehensive cost-benefit analysis in the Australian context for early childhood education. They estimate $2 billion in costs for 15 hours of childhood education for one year before school, compared to $4.8 billion in benefits.[15] This produces a benefit-cost ratio of $2 in benefits generated for every $1 spent.

Some studies report cost-benefit analyses for workplace-integrated education and training through apprenticeships. The Centre for Economics and Business Research (CEBR) in the UK (2014) measures the wage premium by taking the total number of jobs requiring apprenticeships, quantifying total earnings in these jobs, and comparing to earnings in counterfactual jobs that do not require apprenticeship completion for entry. They find economic gains in higher wages, productivity and government revenues totalling £31 billion per year. Higher employment levels reduce government expenditure on unemployment benefit payments by £370 million per year, and benefits to organisations while training apprentices in reduced wages bills are worth an additional £2 billion per year. For each £1 of public money spent, apprenticeships generate an additional £21 for the national economy.

The Conference Board of Canada (2019) develops two main benefit 'streams' for calculating the economic benefits and costs of high school education completion. The first model captures the economic footprint of high schools as economic actors in their own right—including direct, indirect and induced economic impacts. The sum of all these effects represents the overall impact of the sector's economic footprint. They find that, including indirect and induced impacts, a 1% increase in public education spending in Ontario supports around 4200 additional jobs. An increase in fiscal spending on education of 1% (or an additional CA$291 million in spending on education services) leads to an additional CA$371 million in economic activity—demonstrating an economic multiplier of 1.3-to-1.

The second Conference Board stream uses a scenario approach in three areas of government spending—social assistance, healthcare and criminal justice—to quantify the fiscal savings from raising the high school graduation rate. They identify annual cost savings of CA$5 million in social assistance (and a cumulative saving of CA$1 billion to 2040); CA$6 million in annual savings for public healthcare (or CA$1 billion in cumulative savings to 2040); and CA$5 million in reduced annual criminal justice spending, compounding to another CA$1 billion in aggregate savings.

[15] The study discounts long-run future benefits at 3% per year.

Our study considers both of these 'streams' (the economic footprint of the education system's operation, and the fiscal savings arising from improved life chances for graduates) in assessing the economic impacts of TAFE.

Higher wages and employability

There is a significant body of academic and policy literature demonstrating the strong earnings and employment returns to VET. A UK study by Conlon and Patrignani (2013) find an earnings premium associated with completing VET of 2–4% per year in the workforce for seven years post-qualification attainment, and a 3–4% increase in the probability of employment.

Several international and Australian studies have estimated the earnings returns to vocational education, typically by comparing the earnings of VET graduates with those of Year 12 or below–Year 12 earners. For example, a recent Australian study on returns to education by Gong and Tanton (2018) uses Household, Income and Labour Dynamics in Australia (HILDA) survey data to assess the returns to post-school qualifications compared with Year 12 between 2006 and 2016. No wage premium to vocational education compared with Year 12 is identified (for either males or females). A key limitation of the findings is the exclusion of self-employed workers (who are typically higher-paid VET qualification-holders). Moreover, a comparator of Year 12 alone is less relevant to measuring the benefits of VET qualifications, for several reasons: including that many students enter VET without having completed Year 12. A more appropriate baseline to measure the impacts of VET would include school leavers and the unemployed. This is confirmed by the significant negative wage premium identified for not finishing Year 12 of around 10% for males and 8% for females.

Long and Shah (2008) assess returns to VET compared with a composite group of workers whose highest level of schooling was Year 12 or below. Incomes of the self-employed, as well as the unemployed, are included. Confirming that VET is an important pathway for school leavers, the study finds that rates of return to VET are higher for those whose highest school qualification was Year 10, as compared to Year 12 (particularly for females). The study finds that the individual return on investment for males undertaking Diplomas or Certificates III/IV and for females undertaking Diplomas exceeds 20% for full-time study.[16] Rates of return increase greatly for part-time students, due to lower forgone earnings.

Leigh (2008) also identifies significant individual returns to vocational education, and describes the source of returns: around one-third of the gains arise from higher productivity, and two-thirds from higher labour force participation. Compared with an educational attainment of Year 11 or below, Wilkins and Lass (2018) find a 25% wage

[16] Individual return on investment is the additional income earned through the VET qualification, minus the costs of enrolling in VET courses, which include course fees, income forgone while studying, non-completion costs, and impacts of subsidies on individual VET course outlays.

premium to Certificate III/IV-holding males (but no significant premium for females), and a 39% and 14% premium to Diploma- and Advanced Diploma-holders among males and females, respectively.[17]

One international study on increased female labour force participation due to access to low-fee childcare in Quebec, Canada, is useful for the present study's assessment of increased employability (Fortin et al., 2018). The authors estimate that an additional 70,000 women entered the workforce due to enhanced childcare access, raising total employment by 1.7% and GDP by CA$5 billion. This influx of new wage incomes and GDP returned an estimated CA$2 billion in government revenues and social assistance savings, far exceeding net expenditure of CA$2 billion on the enhanced access program—showing that this policy literally more than paid for itself.

Additional productivity benefits

Once the wage and employment returns associated with holding a particular qualification are calculated, the productivity gained by the qualification can be estimated. Some studies assume that returns to educational qualifications reflect the individual worker's marginal productivity (for example, KPMG 2018a, 2018b). Hayward et al. (2014) vary this assumption, allowing for productivity increases greater than wages, recognising that if the productivity of an individual were not greater than their cost, employers would lack an incentive to employ that individual.

A longitudinal UK study by Dearden et al. (2005) finds that only half of the benefit of training accrued to the individual in higher wages; the rest was captured by employers and/or consumers through enhanced profit share and/or lower output prices. This finding is consistent with Australian research, which has identified a long-term decline in labour's share of total national income, as well as a weaker relationship between wages and labour productivity.[18] In that context, the productivity benefits of vocational education cannot be proxied by a wage premium alone.

Education and health

There is substantial international and Australian evidence of strong links between education and health outcomes. This is partly explained by an observed correlation between education and health determinants—such as risk taking, smoking, and using (or not using) preventive services (Australian Institute of Health and Welfare, 2019; Feinstein et al., 2006). A UK study

[17] The absence of a wage premium for full-time employed women holding Certificate III/IV qualifications compared to Year 11 and below reflects entrenched low-wages environments that are typical of the undervalued feminised industries into which these qualifications provide entry, such as healthcare and community and social services.

[18] See, for example, Flanagan and Stilwell (2018) and the research referenced therein.

finds that individuals with higher vocational degrees were less likely to visit the GP than individuals with no post-school qualifications (Windmeijer and Santos Silva, 1997).

In Australia, Stanwick et al. (2006) find that Australian males whose highest qualification attainment was a Diploma or an Advanced Diploma were 0.5% more likely to have better physical health and 1% more likely to have better mental health than those who had reached Year 11 or below. The Mitchell Institute finds that 42% of male and female school leavers of working age have a long-term health condition, compared to only 26% of the general working-age population (Lamb and Huo, 2017).

Costs of the TAFE System

This section outlines the direct costs of delivering the TAFE system in its current (downsized) condition. Table 4 provides a summary of the various cost categories included in our analysis for 2018 (these are the most recent data currently available). We have considered all direct costs of TAFE delivery, including government funding for training and administration, employer and student assistance, loans and income support payments, student fees, and employer costs for training apprentices and trainees. We do not include certain indirect VET costs associated with education, such as tax expenditure (forgone revenues for government) and opportunity costs (forgone earnings for students).

Table 4
Summary of TAFE Costs Items and Annual Costs

	Item	Estimated Annual Cost (2018)
Government	Total funding (Commonwealth and state/territory, including capital costs)	$3.17 billion
	Employer assistance	$84 million
	Study assistance	$17 million
	Administration and governance	$77 million
	VET Student Loans and Trade Support Loans	$243 million
	Income support payments	$59 million
Total Government		**$3.65 billion**
Students	Student fees	$1.13 billion
Employer	Apprenticeship and traineeship training costs	$934 million
TOTAL		**$5.71 billion**

Source: Author's compilation from NCVER (2019c); student fees across consolidated state/territory figures from TAFE Annual Reports 2018–19 for NSW, ACT, South Australia and Queensland; WA from Office of Auditor General, Appendix 3: Universities' and TAFEs' expenditure and sources of revenue. Apprenticeship costs derived from ABS 6306.0 (see Footnotes 26-27).

Where specific TAFE institute data were available, this was utilised in our analysis. Where disaggregated data by VET provider type were not available, our estimates of TAFE institute costs were based on the TAFE system's share of all VET students in 2018 (including private providers), or on the TAFE institutes' share of all students undertaking vocational education

with public providers. All student population data are sourced from NCVER. Each cost item has been calculated on an annual basis.

TAFE Delivery and Administration

NCVER (2019c) collates data on total government funding for Australian VET including funding allocations across Commonwealth and state/territories. Certain funding activities can be split by provider type, including private, public and other categories. 'Public' provider funding includes total government funding for VET activities to TAFE institutes, skills institutes, polytechnics and universities. Total VET provider-level figures include funding for VET delivery (all funding for the delivery of training outcomes, including operational/base and block funding, and subsidies targeted at supporting access), as well as capital funding (major capital projects and acquisitions to host VET training). Using NCVER total VET student data, we estimate the TAFE system's share of VET students studying within public providers (92%) and then scale the total public VET funding for 2018 by the TAFE student share. The total annual cost of TAFE VET delivery (including capital costs) is thus estimated at $3.2 billion.

Other funding activities reported separately in NCVER's government funding inventory (and not included in the funding by provider data) relevant to the costs of TAFE delivery include employer assistance, student assistance, and system administration and governance funding. The proportion of these total VET costs attributed to TAFE institutes is calculated based on their 14% share of total VET students in 2018. Note that:

- Employers receive government assistance to engage in VET, including funding for workforce training, and incentives to take on apprentices and trainees. General assistance for employers to engage in VET information and administrative support includes tax exemptions, offsets and rebates. The total annual cost of employer subsidies for TAFE students is estimated at $84 million.

- Students receive assistance for equipment, travel and other non-tuition costs associated with undertaking VET study. Student assistance funding includes loans, grants and subsidies to VET students. The proportion of this student assistance flowing to TAFE students is estimated at $17 million.

- The costs of administering the national VET system, including supply and services, and of employee expenses within each jurisdiction's VET portfolio (including direct administration and governance costs of the providers, including TAFE institutes) are captured within the cost of system administration and governance of TAFE institutes. This is estimated to be $77 million.

Student Loans

Student loans represent additional costs within the TAFE system delivery. The Commonwealth Government provides funding for two income-contingent loan schemes: the VET Student Loans program (which includes grandfathered VET FEE-HELP loans) and the Trade Support Loans Scheme.[19] Government provisions for VET loans are presented separately in NCVER's government funding tables. NCVER reports the total VET Student Loan amount in the reporting year, rather than the ultimate net costs to government of administering the loans. Actual costs would account for repayment of most of the loans over a given period of time.[20]

Given the lack of government data on actual VET Student Loan costs by provider type (public and private providers), and the ambiguous status of government financing of VET loans (such as a 2019 decision to absorb $500 million in 'dodgy debts' associated primarily with private providers), we elect to use NCVER's total loan amount figures as proxies for government student loan costs. The cost of all income-contingent VET Student Loans to TAFE students is calculated as a proportion of all VET Student Loans paid to students enrolled at public institutions. The TAFE institutes' proportion of public loan costs is based on their 2018 share of all public students (92%).[21] The total cost of income-contingent VET Student Loans to TAFE students is therefore $175 million.

Eligible apprentices can apply for assistance with the costs of living and learning through the Trade Support Loans Scheme. Loans of up to $21,078 for eligible apprentices are distributed over four years (Commonwealth Government, 2019). The total cost of Trade Support Loans to TAFE students is calculated based on the TAFE system's share of apprentices and trainee students in the VET system in 2018 (32%). The estimated annual cost of Trade Loans to TAFE students is therefore $68 million.[22]

[19] While the Commonwealth is the main funder of income-contingent loans, states and territories contribute 50% to the cost of loan debts not expected to be repaid by government-funded students. These payments are transferred from states and territories to the Commonwealth each year. In 2018, the value of these transfers was $8.5 million (NCVER, 2019c).

[20] NCVER's loans reporting includes the value of grandfathered VET FEE-HELP 'dodgy debts' (in addition to new loans made under the new VET Student Loans). As stated above, government has elected to absorb at least $500 million of these debts in 2019, indicating that total loan amounts would still be acceptable indicators of government loan costs to students of private providers until the new loans system applies and the sector recuperates.

[21] TAFE institutes are the dominant provider of government-funded VET however there are a smaller number of other government providers including community education providers.

[22] This estimate does not include the smaller Living Away From Home Allowance (LAFHA) program, which is a weekly payment to apprentices starting at $77.17 each week in the first year of the apprenticeship. Payments reduce to $25 each week in the third year.

The total cost of income-contingent loans to TAFE students and apprentices totals to $243 million: $175 million for VET Student Loans and $68 million for Trade Support Loans.

Student Income Support Payments

Many TAFE students can receive additional income support while undertaking study. Study allowance and support payments considered in our calculation include:

- Youth Allowance (which is the primary income support payment for full-time students and apprentices aged 16–24)
- Austudy (which is a separate income support program for students who commence full-time studies or training when they are 25 years or older)
- ABSTUDY (which is a specifically designated income support payment to Indigenous students in secondary and post-school education).

According to the most recent available data on Youth Allowance payments to students and apprentices by sector from the Department of Social Services, the vast majority (78%) of all payments at June 2016 went to students in higher education. A further 14% of recipients were undertaking VET, while 5% were undertaking schooling and 2% apprenticeships (and 1% were unspecified).[23] The combined total income support share relevant to the VET sector is 16% (including VET and apprenticeships) (Department of Social Services, 2016)

Meanwhile, Department of Education and Training higher education data show that the proportion of domestic students enrolled full-time (a criteria for Youth Allowance student payment eligibility) in university education has remained steady from 2016–18 (Department of Education and Training, 2017). The number of VET students studying full-time declined by 10% between 2016 and 2018 (NCVER, 2018b). We assume that these changes to full-time rates have had a negligible impact on 2016 income support payment data. We also assume that Austudy and ABSTUDY payments are distributed across sectors in the same proportions as Youth Allowance.

Total government spending on Youth Allowance, Austudy and ABSTUDY was $2.6 billion in 2018.[24] We first estimate that 16% of that total income support spending was received by VET students (including apprentices). We then calculate the TAFE system's share as a

[23] The Department of Social Services produces two Youth Allowance payment trends reports: (1) all Youth Allowance income support payments paid to young people who are seeking paid work and undertaking activities (like study and training) to improve employment prospects; and (2) Youth Allowance payments to students and apprentices. We refer to data on payments to students and apprentices only. Most of the recipients of this payment are university students, since they are more likely to undertake study on a full-time basis (which is a requirement for payment eligibility).

[24] 2018 Actuals. From Budget 2018–19, Department of Social Services Budget Statements, Table 2.1.2: Program components of Outcome 1.

proportion of all VET students in 2018 (14%). Annual government spending on income support to TAFE students is therefore estimated at $59 million.

Student Fees

Most VET providers (including TAFE institutes) charge students fees for the administration of courses, for tuition, and for the provision of materials and amenities. These fees vary according to the type of course and its duration as well as the institution providing the course. Table 5 presents the annual costs of student fees by each state and territory. Consolidated annual reports for all TAFE institutes operating within the jurisdiction were not available for Victoria or Northern Territory. For these jurisdictions, NCVER student data for full-year training equivalent students were utilised to derive estimations of total student fees.

Table 5
TAFE Student Fees and Other User Charges by Jurisdiction

	Total Student Fees and Other User Charges ($ million)	TAFE Student Full-Time Training Equivalents (FTE)	Cost per FTE
QLD	$238.9	27,625	$8649
NSW	$373.2	106,545	$3503
SA	$88.7	13,400	$6622
WA	$123.9	36,505	$3394
ACT	$11.8	5650	$2083
TAS	$13.5	5695	$2364
NT*	$7.1	3380	$2089
VIC*	$272.4	77,870	$3499
Total	**$1129.51**	**276,670**	**Avg. $4083**

Source: Total fees include student fees and other user charges. Consolidated state/territory figures from TAFE Annual Reports 2018–19 for NSW, ACT, South Australia and Queensland. WA figure from Office of Auditor General, Appendix 3: Universities' and TAFEs' expenditure and sources of revenue. Reporting for 'Sales of Goods and Services' used for NSW due to no separate reporting of fees.
*Figures for Victorian and NT jurisdictions estimated based on Full-Year Training Equivalent student data in comparable jurisdictions
(assuming Victoria FYTEs = 73% of NSW, and NT FYTEs = 60% of ACT).
Student FYTEs data from NCVER *Government Funded Students and Courses 2018*. FTYE TAFE figures include other government providers.

Total student fees (and other user costs) charged to TAFE students in 2018 were approximately $1.1 billion. The average annual cost of student fees per full-time training

equivalent was $4082. TAFE students in Queensland pay the highest fees ($8649 per FTE), while those in the ACT pay the lowest ($2083 per FTE).

Apprenticeship Training Costs to Employers

Apprenticeships are a system of regulated training where the apprentice, a paid employee, combines on-the-job training and work experience with formal (usually off-the-job) training. TAFE institutes facilitate around half of all apprenticeship and traineeship programs, and most apprenticeships are in skilled trades (such as plumbing, hairdressing and carpentry). Traineeships, meanwhile, combine off-the-job training with an approved training provider with on-the-job training and practical work experience. Traineeships are more common in vocational occupations (such as business administration and tourism) and are typically shorter in duration than apprenticeships: typically lasting 1–2 years compared with the 3–4 years of an apprenticeship.

Training contracts require employers to create paid employment upon completion of the apprenticeship, which means that employers also determine the number of apprenticeships at any given time. Apprenticeships and traineeships are the strongest vocational pathways available to full-time employment or self-employment.

Employers benefit in the long run from taking on apprentices, via higher productivity, reduced recruitment and retention costs, and increased output. A UK study by CEBR (2014) estimated annual output gains accruing to businesses through hiring apprentices of £1.8 billion. In the short run, employers incur the costs of training apprentices by providing instruction, training and supervision for the on-the-job component of the course. Apprentices are paid at a lower hourly rate to offset the training costs incurred by employers, and upon completion they can either transfer into standard employment or commence self-employment as qualified tradespeople.

We calculate the employer costs of apprenticeships delivered under the TAFE system based on the time sacrificed by other employees to provide on-the-job training. There were approximately 100,300 apprentices and trainees studying in TAFE institutes in 2018 (most recent data). This represents half of all government-funded apprenticeship programs and 32% of 310,000 total VET apprenticeships and traineeships in 2018 (NCVER, 2019a). Over 90,000 TAFE apprenticeship and traineeship students (around 91%) studied on a part-time basis, while 9% studied on a full-time basis. We derive an estimate of the average number of hours taken by senior employees to train apprentices and trainees per week using ABS data on the average weekly working hours of part-time apprentices (19 hours per week) and full-time apprentices (40 hours per week).[25]

[25] ABS Catalogue 6306.0, Table 1, non-managerial employees. Average total weekly hours paid to part-time apprenticeships, traineeships and employees with a disability (male and female) is 19 hours, and 40 hours for full-time programs.

We supplement ABS data with a review of part-time apprentice hours schedules within state skills regulations, which propose the breakdown of hours between structured off-the-job training (46% of weekly hours) and employment (54% of weekly hours).[26] These ratios are scaled to the ABS working hours data with the reasonable assumption that 40% of mandated employment time is spent in supervision and training, to reach an estimate of four hours lost each week to train apprentices undertaking their program on a part-time basis, and nine hours per week for full-time apprentices. Training hours estimates are combined with average hourly wage data from the ABS to find the wage value of sacrificed time.[27] The estimated annual employer cost of training TAFE apprentices and trainees is approximately $8400 per part-time apprentice per year and $18,800 per full-time apprentice per year, or $934 million per year for all TAFE apprentices.[28]

Total TAFE System Costs

As summarised earlier in Table 4, we estimate that the total combined cost for delivering VET through TAFE institutes for 2018—including government funding for training and administration, employer and student assistance, loans and income support payments, student fees, and employer apprenticeship and traineeship training costs—was $5.71 billion. This amounts to 0.3% of Australia's annual GDP: a very modest investment indeed.

[26] Skills authorities within each state or territory regulate the minimum hours that must be undertaken in on-the-job and off-the-job training for apprenticeships and traineeships. We use the Victorian Registration and Qualifications Authority's (2017) training:employment ratio of at least 13 hours per week for part-time apprenticeships, comprising seven hours of employment (54%) and six hours of structured off-the-job training (46%), and we adjust for ABS figures. We assume that 40% of mandated employment time is spent in supervision and training.

[27] From ABS Catalogue 6306.0, Table 1 Non-managerial employees. This database provides average hourly pay for adult, junior and apprentice employees. We assume that workplace supervisors and trainers are more likely to be adult, non-managerial workers. Average hourly earnings for an adult employee in 2018 were $40.10. This average is for both full-time and part-time, and male and female, employees.

[28] The net cost to employers is much lower after employer assistance subsidies are factored in.

Benefits of the TAFE System

We now consider the various economic, fiscal and social benefits generated as a result of Australia's present and past investments in quality public vocational education through the TAFE system.

ECONOMIC BENEFITS OF TAFE PRODUCTION

Direct Economic Activity

Australia's TAFE system constitutes a major economic industry in its own right: generating billions of dollars in economic activity and revenue, supporting tens of thousands of jobs and producing billions of dollars of value-added services each year. Hence consideration of the economic value of TAFE institutes should commence with a description of those direct economic contributions, as summarised in Table 6.

Table 6
Direct Economic Footprint of TAFE Institutes (2018)

Total Revenues	$3.7 billion
Enrolled Students	833,000
Direct FTE Employment	30,000[1]
Direct Total Employment	45,628[2]
Wages and Salaries Paid	$2.3 billion
Supplies and Inputs Purchased	$1.6 billion[3]

Source: Author's compilation and calculations from TEQSA (2018), NCVER (2019a), and ABS Catalogue 5209.0.55.001.
1. FTE, estimated based on state TAFE reporting and KPMG (2018b).
2. Total employees at 2019, reported by Knight et al. (2020), Table 1.
3. 2016–17.

Table 6 summarises several indicators of the direct economic contribution made to Australia by TAFE institutes.[29] Total revenues for the TAFE system in 2018 were approximately

[29] Because of a lack of consistent and consolidated data on TAFE system finances, employment and other indicators, these data have been compiled from numerous sources and hence should be interpreted as estimates of the general magnitude of the economic impact of the TAFE system.

$3.7 billion, funded through a combination of direct government support, indirect aid to students, student tuition fees and other sources of income.[30]

The system enrolled some 833,000 students in 2018, representing around one-third of all students who participated in vocational training that year. However, that share is misleading, because the typical TAFE student participates in a more intensive and longer-lasting course of study than students in most private vocational programs (which often consist solely of individual courses or micro-credentials). Despite their reduced funding base and staff resources, TAFE institutes provide over half of all vocational instruction hours (Zoellner, 2019).

We estimate that there are approximately 30,000 FTE employment positions supported by the TAFE system.[31] About two-thirds of these are for instructor positions, and one-third are for various administration and support functions (Productivity Commission, 2011). Barely one-third of TAFE positions are full-time permanent jobs; the rest are part-time and casual roles (Productivity Commission, 2011). Therefore, the number of individuals employed at some point in the year through the TAFE system is much larger than the 30,000 FTE roles. NCVER recently estimated that there are 45,628 total employees of TAFE institutes (Knight et al., 2020). Total employment in TAFE institutes has declined by about one-quarter (or some 10,000 FTE positions) in the last several years, as a direct result of the funding crisis affecting the whole system. Nevertheless, TAFE institutes remain important employers. This is especially true in many regional communities, where TAFE institutes are often both the only local source of tertiary education and one of the most important regional employers.

Together, TAFE institutes generate around $2.3 billion in total wages, salaries and other employment benefits.[32] This represents an important injection of economic confidence and spending power into Australia's economy. This is especially so at a point in history when wage income has been growing at the slowest sustained rate in the entire post-war era, and consumer spending and confidence has now been hammered by the COVID-19 pandemic and the economic crisis resulting from it.

Supply Chain Purchases

The economic stimulus generated by the TAFE system's provision of VET extends well beyond the walls of the TAFE institutes themselves. TAFE institutes also spend many hundreds of millions of dollars per year on supplies and services purchased from a wide range of other businesses and sectors. These purchases extend and multiply the impact of the TAFE system's activity on the broader national and regional economies. These are

[30] The revenues received by TAFE institutes constitute only a portion of the total costs of the TAFE system (catalogued in the previous section), since some of those costs are incurred by other actors (including students and employers), not by the TAFE institutes themselves.

[31] This is an estimate of full-time equivalent employment, based on state TAFE reporting and KPMG (2018a).

[32] This figure is calculated from TEQSA (2018).

termed ‘upstream’ economic benefits—extending up into the myriad of supply and service sectors which sell goods and services to TAFE institutes. They are especially important to smaller businesses in the regional areas served by TAFE institutes located outside of the major capital cities.

An estimate of the scale of these upstream supply chain linkages can be gleaned from Australian Bureau of Statistics (ABS) data regarding input-output linkages between various industries in Australia’s economy. The ABS database does not have a separate category for TAFE institutes, which are consolidated in those statistics within a broader tertiary education category. But on the reasonable assumption that the quantity and mix of supply purchases is broadly similar for TAFE institutes to those of other tertiary education providers, the upstream purchases of TAFE institutes can be estimated as a proportion of total tertiary education purchases.

Table 7
TAFE Supply Chain (2016–17)

Supply Industry	Purchases ($m)	Supported Employment
Agriculture	7.8	40
Mining	8.4	6
Manufacturing	110.1	252
Utilities	36.2	30
Construction	46.6	131
Trade	130.3	261
Hospitality Services	29.8	300
Transport	115.5	420
Information Services	162.6	343
Property and Finance	342.6	1066
Computer and Technical	172.9	844
Administration Services	209.3	2062
Public and Safety	77.0	575
Education Services	47.7	750
Other Services	99.4	832
Total Supply Purchases	**1596.2**	**7912**

Source: Author’s calculations from ABS Catalogues 5209.0.55.001 and 8155.0, and TEQSA (2016), as described in text.

Table 7 describes these supply chain purchases by the TAFE system. The ABS database indicates that tertiary education institutions buy inputs and supplies from 113 different

industry groupings—a supply chain that reaches into every state and major sector of the national economy. Table 7 groups those purchases into 15 major sectors. Together, these sectors receive about $1.6 billion worth of purchases per year from the TAFE system.

The biggest suppliers in dollar purchases to the TAFE system include property services, administration services, computer and technical services, trade, transportation, and manufacturing. But there is virtually no segment of Australia's economy which does not receive some significant incremental business as a result of the supply chain purchases from the TAFE system.

Moreover, since this business contributes incrementally to the scale and viability of those supplying firms, it also underpins significant quantities of employment in those other industries. On the basis of average employment content ratios prevailing in each of the major supplying industries, Table 7 also lists the number of jobs supported in those industries as a result of their sales to the TAFE system. Across the whole set of supply industries, about 8000 jobs (in addition to the direct positions within TAFE institutes themselves) are supported by the ongoing supply purchases of the TAFE system. Again, the industries receiving the largest boosts to employment thanks to upstream linkages to the TAFE system include administration, property services, and computer and technical support.

Downstream Linkages and Consumer Spending

A third category of economic benefit generated by the production activity and employment of the TAFE system must also be considered in evaluating the overall economic impact of TAFE institutes. There is a significant volume of incremental consumer expenditure generated by both direct employment within the TAFE system and the jobs supported upstream in the TAFE supply chain. These are called 'downstream' benefits, since they occur as a consequence of the payment of incremental wages and salaries to people employed as a result of the TAFE system's activity.

These spillover effects of public sector direct and indirect employment on downstream consumer spending are particularly important during periods of broader economic weakness—such as in Australia today, given the pronounced economic slowdown that has taken hold in recent months. These downstream stimulus effects are stronger for purchases (like labour-intensive services, such as vocational education) that generate greater flows of direct income for domestic residents, as compared to more capital- or import-intensive purchases. (For these latter, more of the expenditure's effect is dissipated away from the state and national economies.)

The wages and salaries generated by TAFE institutes total to about $3 billion per year: including $2.3 billion paid to people directly employed by TAFE (from Table 6 above), along with an additional amount corresponding to the incomes of workers employed in the TAFE system supply chain. On average in Australia, consumers spend two-thirds of their

incremental income on final consumption spending (after deducting taxes and personal savings).[33] Expenditure in Australia on average encompasses an import penetration ratio of just over 20%: that is, one dollar of every five is spent on imported goods and services.[34] This implies that around 50 cents of each dollar in incremental income is spent on Australian-made goods and services.[35]

Therefore, the $3 billion in incremental employment income generated by TAFE institutes and the TAFE system supply chain translates into an additional $1.5 billion in incremental consumer spending on Australian-made goods and services. On the basis of average employment ratios across the whole range of produced goods and services, this supports an additional 10,000 jobs.

Combined Economic Impacts

Table 8 summarises the combined employment impacts arising from the direct production activity of TAFE institutes, their upstream linkages (through supply industries) and their downstream linkages (through the range of consumer goods and service industries). In total, some 48,000 positions are supported, directly and indirectly, thanks to the presence and activity of Australia's TAFE system. At a moment in Australia's economic history when further growth and job-creation is threatened by unprecedented uncertainty and risk, both at home and abroad, this positive anchoring function of high-quality, public vocational education is especially crucial.

Table 8
Combined Upstream and Downstream Linkages

A. Direct Employment	30,000
B. Employment in First-Tier Suppliers	8000
C. Employment in First-Round Consumer Spending	10,000
D. Total Employment (A + B + C)	**48,000**
Source: Author's calculations as described in text from ABS Catalogues 5209.0.55.001, 8155.0, and 5206.0.	

[33] Author's calculations from ABS Catalogue 5206.0, Table 20.

[34] Author's calculations from ABS Catalogue 5206.0, Table 3.

[35] More precisely, 79% (domestic expenditure share) of 67% (average expenditure propensity) equals 53% (average propensity to spend on domestic production).

LABOUR MARKET BENEFITS

Another important impact of TAFE is felt through the earnings and productivity of TAFE-trained workers once they graduate and find employment. We include here several channels through which TAFE training enhances the labour market prospects and economic contribution of workers, including: greater labour force participation and employability; higher earnings for TAFE graduates; benefits for employers through increased productivity; and increased revenues for governments (through higher tax revenues resulting from higher incomes).

These labour market benefits are not limited to TAFE graduates, but also flow to other stakeholders. Increasing the supply of skilled labour to the economy allows employers to more easily fill labour shortages and to harness a larger and more productive workforce. With increased access to skilled workers, industry can expand production and employ more people, increasing total output across the economy.

Higher Earnings for TAFE-Qualified Workers

TAFE graduates are not only more likely to be employed but they are also more productive in their jobs. TAFE graduates go on to work in many economically and socially valuable sectors such as construction and industrial trades, resources, community and social services, and various private services. The TAFE system has delivered value-adding skills and qualifications to the majority of all employed people with VET qualifications.

We estimate the earnings benefits of VET qualifications (including Certificates I/II/III/IV, Diplomas and Advanced Diplomas), compared to the earnings of employed workers without post-school qualifications, in the following manner. Average weekly earnings were obtained for all employed people with a VET qualification (Diploma, Advanced Diploma, or Certificate I/II, III/IV[36]), and then compared to those for workers without post-school qualifications.[37] On an annual basis, this indicates an annual earnings premium of almost $19,000 derived by workers with a VET qualification as their highest post-school qualification (compared to those with no post-school education). This represents a wage premium to VET graduates of 39%, which is within the broad range of wage premia identified in other studies.[38] Across the entire workforce of VET-qualified workers in Australia (some 3.5 million workers in 2019,

[36] No separate data for Certificate I/II were available. We used 'other' post-school qualifications as a proxy for Certificate I/II.

[37] Data from ABS Catalogue 6333.0, Table 5.1.

[38] Wilkins and Lass (2018) find a 39% and 14% premium to Diploma- and Advanced Diploma-holders compared to Year 11 attainment among males and females, respectively, and a 25% wage premium to Certificate III/IV-holding males. (They find no significant premium for females.)

based on data from the same ABS source), this translates into combined additional earnings returned to VET qualifications of some $68 billion.[39]

Not everyone in the Australian workforce who holds a VET qualification received that qualification through the TAFE system, however. So we estimate the proportion of the current stock of workers holding a VET qualification who are likely to have received that qualification from a TAFE institute (or another government-provided institution).[40] TAFE institutes were the predominant VET provider from 1970s until the early 1990s, when deregulation policies gradually increased the number of private non-TAFE graduates entering the workforce.

Since labour force data regarding the proportion of Australian workers holding a VET credential do not identify the source of that credential (that is, whether it came from a TAFE institute or some other form of institution), we estimate the proportion of the current workforce holding VET qualifications which came from the TAFE system by converting data on the annual flow of TAFE graduates (as a proportion of all VET graduates) into an estimated share of the cumulative stock of VET graduates. This method takes account of the changing flow of total VET activity over time, the changing importance of TAFE versus non-TAFE providers, and variability in both longevity and labour force participation for various age cohorts (see the Appendix for more detail).

Following this approach, we estimate the proportion of TAFE-qualified workers (as a share of the stock of all workers with VET qualifications) as 72.5%. We use that parameter to scale the number of currently employed Australian workers with VET qualifications and thus to estimate the proportion who received their qualifications from a TAFE institute or another government-funded institution. If 72.5% of higher earnings resulting from VET qualifications come from the TAFE system, we estimate the additional earnings of all TAFE-qualified workers (relative to earnings of workers without post-school training) at $49.3 billion in 2019.

Increased Participation and Employability

A TAFE education significantly improves the employment outcomes of its graduates after they enter the labour market. NCVER survey data (2019b) confirm this employability

[39] Some other research has attempted to control for other worker characteristics (such as age, gender, occupation and other variations across workers) by estimating a 'pure' return to education. Meanwhile, some research even accounts for 'self-selection' by workers (whereby workers who are inherently more productive are assumed to pursue higher education, including VET, and hence their higher earnings are attributed to their personal capacities rather than to their education). In our judgment, however, a simpler aggregate estimate of the earnings premium achieved by VET graduates is a more meaningful and legitimate expression of the increased earnings potential of VET graduates, regardless of the precise decomposition of that earnings premium between a worker's training and their personal capacities.

[40] NCVER's historical data do not distinguish TAFE from other direct government providers.

advantage for TAFE students. Among those TAFE students who were awarded a qualification in 2018, or who completed at least one subject at a TAFE institute that year:

- 41% were not employed before training but were employed after training.
- 61% reported an improvement in their employment status, including being employed at a higher skill level, obtaining employment after being unemployed, receiving other job-related benefits (like the ability to set up or expand their business), receiving a promotion, increasing their earnings, or having new useful skills relevant to the job.[41]
- 85% were in employment or were engaged in further study.

In sum, after training, TAFE students are more likely to be employed and less likely to be unemployed. These are crucial employment benefits from VET.

We estimate the increased participation and employability effects of the TAFE system in the following manner. ABS data report the labour force status of Australian workers according to their highest achieved educational qualification.[42] We calculate average participation and employment rates for two composite categories: those with VET qualifications (including Diplomas, Advanced Diplomas, and Certificate III/IV qualifications[43]), and those with no post-school education (whose highest achieved education is Year 12 or below).

As summarised in Table 9, workers with VET qualifications have a substantial advantage in both labour force participation and employability, compared to those without any post-school qualifications.

In 2019, workers with a VET qualification demonstrated a labour force participation rate 14% higher than those with no post-school qualifications. In addition, VET-qualified workers were more likely not only to participate in the labour market, but also to be employed once they started looking. The unemployment rate for VET-qualified workers is significantly lower than for those with no post-school training (4.2% in 2019, versus 6.5%), and hence the employment rate (as a share of the total population) was 15 percentage points higher. This reflects both increased participation and greater success in finding work for those in the labour force. The increased employability of the VET-educated population, relative to those without post-school education, translates into an increment of 670,000 more employed Australians.

[41] Improved employment status may be defined in any, or several, of the ways listed here. An individual can indicate a positive response to more than one measure contributing to their improved employment status.

[42] See ABS Catalogue 6291.0.055.003, Table 24a. These data only cover workers aged 20–64 years old.

[43] As noted earlier, the data do not separately report workers with Certificate I/II qualifications. In addition, previous research has indicated little difference in labour market outcomes for those workers compared to those with no post-school qualifications.

Table 9 Actual and Counterfactual Employment by Qualification (2019)					
	Population (000)	**Labour Force (000) and Participation Rate (%)**	**Employment (000) and Employment Rate (%)**	**Employment at No-Post-School Employment Rate (000)**	**Difference (000)**
VET-Qualified	4493.8	3831.5 (85.3%)	3671.6 (81.7%)	3000.7	670.9
No Post-School	5104.3	3645.6 (71.4%)	3408.4 (66.8%)		
TAFE Contribution					486.4
Source: Author's calculations from ABS Catalogue 6291.0.55.003, Table 24b. Includes ages 20–64 only.					

Not all that improvement in employability can be ascribed to the qualifications received by those who participated in VET. In some cases, there are underlying factors (at the individual, occupational or regional level) which explain both lower education and lower labour force participation and employability by varying groups of Australians. Nevertheless, the aggregate employment advantage that is clearly associated with obtaining VET qualifications (most of which were attained from TAFE institutes) certainly defines an upper bound of the potential labour market expansion generated by Australia's historic investment in vocational training.

Additionally, not all workers holding VET qualifications received those qualifications from a TAFE institute. As explained above, on the basis of historical data on VET enrolments by type of provider since 1981, we estimate that 72.5% of those Australian workers with VET qualifications received their training in the TAFE system. We thus estimate that the TAFE system has increased employment by around 486,000. Most of that gain reflects stronger labour force participation by TAFE graduates; a smaller portion (about one-eighth) reflects lower unemployment for TAFE graduates in the labour force.[44]

Productivity Benefits for Businesses

If we calculate GDP according to the income approach, we find that national income is equal to the sum of labour and non-labour incomes. Only some of a given increase in GDP

[44] As discussed below, we estimate that unemployment among TAFE graduates is lower in 2019 by about 65,000 positions compared to the counterfactual of them having the same unemployment rate as workers with Year 12 or lower.

(through creation and consumption of extra goods and services) is reflected in a higher wages bill paid to additional workers (labour's share). The remaining share is paid out to other factors, including increased business profits, mixed income, and value-added taxes to government. Therefore, some of the economic benefits arising from the superior productivity of TAFE graduates is not captured in their higher earnings; some is captured in higher profits at the companies they work for.

In fact, for decades in Australia, productivity growth has usually outstripped real wage growth (principally due to a secular decline in employee bargaining power). This means that workers produce far more real output with each hour of labour than they receive in their wages. The result is that labour's slice of the economic pie (including wages, bonuses and superannuation entitlements) has declined from its peak in the mid-1970s. Since 2017, the labour share of GDP has hovered around 47% (Stanford, 2018), the lowest since the ABS began collecting quarterly GDP data. Recent data confirm that the labour share of GDP remains at this historically low level.[45]

We estimate the non-wage benefits of increased productivity from the additional skills of workers with TAFE qualifications in the following manner. To estimate the value of productivity benefits generated by TAFE-qualified workers but captured by businesses, we treat total returns to TAFE qualifications as the labour share of the total productivity benefits of those qualifications. We assume that business captures a proportional share of those productivity benefits in line with the relative scale of the business profits share (flowing to both incorporated and unincorporated firms) in overall GDP.

In 2019, business operating surpluses and mixed income equalled some $675 billion (over three-quarters of which was received by corporations[46]), equivalent to 72.2% of total labour compensation. We thus estimate the total benefits flowing to employers as a result of the superior productivity benefits of TAFE-qualified workers at $35.6 billion (72.2% of the earnings premiums received by TAFE-qualified employees).

The combined additional income generated by the productivity benefits arising from TAFE qualifications (including higher earnings for TAFE graduates, and higher business profits for their employers) thus amounted to $84.9 billion in 2019.

[45] Labour's share of GDP averaged 46.85% in the calendar year 2019. Calculated from ABS Catalogue 5206.0. Table 7 (seasonally adjusted).

[46] Some mixed income can be attributed to the labour effort of owner-managers of unincorporated enterprises, in addition to the return to their invested capital. Since neither portion of that income is captured in labour compensation (which covered employees only), it is reasonable to consider both components of mixed income in this estimation.

Addressing Skills Shortages

There is another distinct channel through which quality vocational education delivered by the TAFE system makes a crucial contribution to the growth, productivity and profitability of the Australian economy. It is well known that Australian employers in several sectors continue to experience pressing shortages of skilled labour, across a wide array of occupations. For example, the Department of Education, Skills and Employment (2019) lists 35 different broad occupational categories experiencing significant shortages as of 2018. Many of the occupations in short supply are vocational in nature, and so those shortages could be ameliorated through an expansion of vocational training. It is especially perverse that Australian employers continue to be held back by the unavailability of skilled labour, when there simultaneously exists a large pool of unemployed and underemployed workers (including many young people) who hunger for decent work. Presumably, these workers would gladly accept the opportunity of a relevant, in-demand career path, instead of trying to survive on low-wage and insecure work in hospitality or other service sectors.

Adjustments in relative wages are not proving sufficient or successful in facilitating market-driven corrections to these shortages (Leal, 2019). Instead, a more proactive and hands-on approach to workforce training and planning is clearly required, to better match the supply of trained workers with the obvious and unmet demand. Indeed, the simultaneous existence of skills shortages alongside underutilised labour attests to the broader failure of Australian vocational education policy.

The cost of these skills shortages is difficult to quantify, but there is no doubt it is high. Employers experience unnecessary and escalating costs for recruitment and retention as they compete with each other for skilled workers (NAB, 2017). New investment projects may be constrained by the unavailability of labour. In just one skills-intensive sector of the economy (technology), firms report billions of dollars of missed opportunities because of their inability to recruit and retain qualified staff (Redrup, 2017).

There is a flip side to the costs arising from Australia's existing skills shortages: they confirm that our current workforce of skilled TAFE-trained workers is generating enormous value and productivity to their employers, and to the whole economy, by virtue of their capacity to perform badly needed skilled labour. We can only imagine the extent and severity of skills shortages in the absence of the existing trained workforce, which is the legacy of our past historical investments in the TAFE system and other vocational education. Investment and export opportunities would be further constrained; Australia's relatively weak progress in applying new technologies would be slowed even further; and employers in dozens of industries would face even more intense challenges to retain skilled workers.

The value of this contribution made by TAFE graduates in reducing skills shortages is impossible to quantify—but it is certainly real. It is another reason why Australia's fiscal investment in quality, public VET must be quickly restored.

Higher Government Revenues

Some of the economic benefits of increased earnings and productivity also flow through to government in the form of higher tax revenues collected through personal income taxes, business taxes, GST revenues and other forms of income. Considering all forms of tax revenue, the federal government collects an average of over 23% of GDP, while state governments collect another 6.4% (not counting federal transfers).

On this basis, the federal government received incremental tax revenues as a result of the higher productivity and incomes associated with TAFE qualifications worth $19.6 billion in 2019. State and local governments, meanwhile, collected an additional $5.4 billion in revenues. Across both levels of government, the incremental taxation revenues added up to $25 billion (see Table 10)—4.4 times more than governments currently allocate to the costs of running the TAFE system. This confirms that governments themselves benefit from making these investments in high-quality, public vocational education.

Table 10
Tax Revenues Generated by TAFE Education (2019)

	Aggregate Tax Ratio (% GDP)	Incremental Tax Revenue from TAFE-Related Productivity ($)
Commonwealth	23.1%	$19.6 billion
State and Local	6.4%	$5.4 billion
Total	**29.5%**	**$25 billion**

Source: Author's calculation as described in text. Tax share data calculated from ABS Catalogue 5206.0, Tables 18 and 19 (includes resource royalties).

Combined Benefits

In sum, students who complete VET qualifications at TAFE institutes move into the labour force with better employment prospects and more skills. This drives higher earnings for TAFE graduates compared to workers without post-school qualifications. Broader benefits are also generated in the form of higher productivity, higher business profits and stronger tax revenues for governments.

Table 11 Summary of TAFE Labour Market Benefits	
	2019 ($)
Increased Employability	486,000 jobs
TAFE Earnings Premium	$49.3 billion
Productivity Benefits to Employers	$35.6 billion
Tax Revenues	$25 billion*
Total	$84.9 billion
Source: Author's calculations as described in text. *Tax revenues are included within total earnings premium and productivity benefits.	

Table 11 provides a summary of the annual benefits generated through the employment, productivity and earnings of TAFE-trained workers in Australia. The total combined annual benefit is $84.9 billion.

FISCAL SAVINGS AND SOCIAL BENEFITS

The benefits of VET qualifications flowing to individuals in the form of higher earnings and employability, to employers via higher productivity and reduced skills shortages, and to government in higher tax revenues also support a wider portfolio of social and fiscal benefits. Below, we document the fiscal savings arising from a more educated, productive and employable workforce in just two crucial areas of government expenditure: welfare and healthcare. We also outline some of the wider (and hard-to-quantify) social benefits of the TAFE system that flow from its public mandate to provide accessible, affordable education to at-risk and special groups and regional communities.

Reduced Welfare Benefit Expenditure

Significant economic and social benefits of vocational education flow from the increased ability of qualified and skilled people to work and earn. By increasing the number of people working, the costs of unemployment (including the cost of welfare support payments) can be reduced. We estimate the value of a reduction in welfare payments due to vocational education attainment based on the unemployment rates for different levels of educational attainment. We calculate the number of people who would likely have been unemployed assuming no post-school qualifications (Year 12 and below) compared with VET qualifications (Certificate III/IV, Diploma and Advanced Diploma). We assume that if employees and owner-managers of incorporated enterprises (OMIEs) with an Advanced Diploma, Diploma and Certificate III/IV did not have that qualification, they would face a higher unemployment rate on par with those without post-school qualifications (see the

Appendix for more detail on our method). On average in 2019, workers with VET qualifications experienced an unemployment rate that was 2.3 percentage points lower than those with Year 12 education or below.

We then consider the rates of unemployment support payments. At the time of writing, this payment was Newstart Allowance, however, the payment was renamed 'JobSeeker' and an additional Coronavirus Supplement payment was introduced as part of the Commonwealth government's COVID-19 response. We estimate the value of a reduction in welfare payments based on the pre-crisis Newstart base rate (i.e. not including the Coronavirus Supplement). However, we include other additional supplementary payments received by almost all (99%) recipients of Newstart Allowance pre-crisis (including the Carer Payment, Remote Area Allowance, transport allowances and the Energy Supplement)—ranging from $11 to $240 per week (Department of Social Services, 2020). At the time of writing, these loaded unemployment benefit rates are as follows: $291 per week, inclusive of supplementary payments; $339 per week, inclusive of supplementary payments and Rent Assistance; and $524 per week, inclusive of Family Tax Benefit and other supplementary payments.[47] We then take the number of potential unemployed persons and apply the different loaded benefit rates depending on the proportion of overall Newstart Allowance recipients who receive those additional payments (see the Appendix for full details of the analysis).

Using this method, we estimate that 64,880 fewer people were unemployed in 2019 because of their TAFE qualification, generating a total annual saving of $1.2 billion to government in reduced welfare benefit costs.

Reduced Health Expenditure

Education is also a powerful mechanism for enhancing the health and wellbeing of individuals, and consequently reducing the need for associated costs of healthcare provision. Education also helps promote healthier lifestyles, and it nurtures human development for individuals, communities and families. Mitchell Institute research finds that 42% of male and female school leavers in the working-age population have a long-term health condition, compared to only 26% of the general working-age population (Lamb & Huo, 2017).

We can thus estimate the number of people with VET post-school qualifications who otherwise would be likely to have long-term health conditions if they had not attained that further education (based on the 16% difference between the 42% school leaver and 26% general population health condition rates).[48] We estimate that around 750,000 additional

[47] The term 'Other supplements and payments' represents the average of Rent Assistance and supplementary payments for recipients also receiving Family Tax Benefit.

[48] Lamb and Huo (2017) did not report a long-term health condition rate for workers with educational attainment above school leavers. Since the 26% rate for the general population also includes school leavers,

workers with VET qualifications would have a long-term health condition if they had not attained Year 12 or any post-school qualifications.[49] Given the absence of information about the average costs of long-term health conditions to healthcare budgets (and the multitude of health outcomes), we do not attempt to calculate the costs of a typical long-term health condition.

Instead, we calculate the cost of long-term health conditions based on the average number of annual GP visits. A UK study finds that individuals with higher vocational degrees were less likely to visit their GP than individuals with no post-school qualifications (Windmeijer and Santos Silva, 1997). We use publicly available Medicare rebate data to estimate the value of reduced demand to access public-subsidised (or bulk-billed) GPs. The average cost of GP visits to government was $38.20 per consultation in 2019, including 1.5% indexation.[50] Public health data indicate that the average Australian visits the GP six times per year.[51] We assume that persons with long-term health conditions present to GPs 50% more than the working population average (a total of nine visits per year used by people with a long-term condition). We estimate the healthcare cost saving based on *both* an increase in the number of people presenting to GPs and an increase in number of GP visits for that group (see the Appendix for full detail). We then scale the total fiscal saving benefit by the estimated percentage of all employees holding VET qualifications who received those qualifications from a TAFE institute (72.5%). The total annual reduction in health-related costs arising from TAFE institute qualifications is thus estimated at $289 million.

Considering just these two dimensions of social costs (welfare payments and costs for GP visits), it is clear that the TAFE system helps to reduce the fiscal expenses ultimately associated with a lack of education (and the resulting individual and social problems that a lack of education causes). The higher number of VET-qualified people in the workforce delivers fiscal benefits to government via lower unemployment rates and a healthier workforce. The estimated saving that TAFE institutes provide through associated savings on social assistance and public healthcare is $1.5 billion per year (Table 12).

this likely understates the health advantages that holding a VET qualification confers. The true difference would be greater than 16 percentage points.

[49] We use Census population data because the positive effects of attaining VET qualifications, such as higher lifetime earnings, continue to impact the health outcomes of people after working life.

[50] Many doctors charge more than the Schedule fee, with an additional 'gap fee' passed onto patients. If GP clinics bulk-bill patients or charge gap fees, in both instances the Schedule fee represents the full cost of each GP visit to the government. (Medicare Schedule fees from Department of Health, 2018, *Indexation of Medicare Benefits Schedule (MBS) items from 1 July 2018.*)

[51] Independent Hospital Pricing Authority (2019*), National Hospital Cost Data Collection Report; Public Sector, Round 21* (Financial Year 2016–17), Table 4. Average cost per episode. Average GP visit data from The Australia Institute of Health and Welfare (2019a).

Table 12 Summary of Social Program Fiscal Savings from TAFE	
	Saving (2019)
Reduced Welfare Costs	$1.2 billion
Reduced Healthcare Costs	$289 million
Total	**$1.5 billion**
Source: Author's calculations from Henriques-Gomez (2019), Department of Social Services (2020), ABS Census (2016), Department of Health (2018), and The Australia Institute of Health and Welfare (2019a) as described in text.	

WIDER SOCIAL BENEFITS

The high-quality vocational education opportunities provided through the TAFE system also underpin a wide array of other social and community benefits that are harder to quantify, but which must be considered in any evaluation of the TAFE system's importance. Some of the most important of these broader benefits include:

- training opportunities in regional areas which are not well served by universities or other tertiary facilities that tend to be concentrated in capital and larger cities
- the provision of 'bridging' access to further education and jobs pathways for disadvantaged and at-risk groups, who would otherwise have little likelihood of entering promising vocations
- greater social cohesion, thanks to the TAFE system's ability to engage young people from all economic and cultural backgrounds in vocational pathways
- reductions in crime and other dimensions of social dysfunction, as a result of incremental improvements in inclusion and economic participation.

As a public provider, the TAFE system fulfils a wider socio-economic mandate in its education and training delivery. Unlike for-profit providers, TAFE institutes are motivated by a commitment to ensuring access and equity in training, and to maximising the all-round social benefits of their offerings. Public charters guide the TAFE system's activities across a range of key areas, regulating course breadth and range (even for low-demand courses, which for-profit providers would quickly jettison) and providing education and training in regional areas (which regularly experience higher youth unemployment rates). Indeed, despite heavy subsidies to private providers to establish 'markets' for VET, TAFE institutes are still the main provider of training in regional areas, due to the infeasibility of private models in smaller population centres. TAFE program completers are also more likely to

represent the bottom two quintiles for socio-economic disadvantage (NCVER, 2019a), and are more likely to be of Aboriginal or Torres Strait Island descent, or to identify as having a disability, compared with students of private VET providers.

By improving education and training affordability and access for these disadvantaged students, the TAFE system provides critical pathways to employment and further education. Private providers have neither the motivation nor (in most cases) the resources to provide vital tailored supports (including flexible payment plans) for students who need them.

Another important benefit of higher education is enhancing the all-round socialisation of students, preparing graduates to participate more fully and effectively in society. In this regard, the TAFE system performs demonstrably better than private providers for each of the 'personal benefits' indicators measured by NCVER's student outcomes data (see Table 13). For example, 40% of TAFE completers between 2016 and 2019 reported that they gained confidence from their training (compared with just 29% for private providers). Almost one-third of all TAFE completers reported that they improved their communication skills and made new friends through their training, compared with only 10–14% for private providers. In addition, a TAFE education increased the standing and leadership qualities of completers, with 12% saying that their training made them a role model in their community.

Table 13
Reported Personal Benefits of Undertaking Training
(2016–19)

	Percent of Completions Reporting Each Benefit	
	TAFE Institutes	**Private Training Providers**
Advance my skills generally	61%	53%
Gained confidence	40%	29%
Satisfaction of achievement	41%	30%
Improved communication skills	28%	14%
Made new friends	27%	10%
Seen as a role model for others in the community	12%	7%

Source: NCVER (2019b). *VET Student Outcomes 2016–19*. Accessed through VOCSTATS.

The TAFE system also provides a unique bridge to further study for Australians who have not finished school, or who seek technical vocational qualifications to improve their future employment prospects. Between 2016 and 2019, 22% of all people who completed a program or subject through TAFE institutes went on to enrol in further study, compared to a 13% continued education rate for private providers.

Another macro-social benefit of high-quality vocational education is greater social cohesion. The most important pathway from education to social cohesion is through income, since educational inequality reinforces income inequality across the life-cycle. Preston and Green (2003) find that high educational inequality is related to negative social cohesion (measured by indicators such as crime and social dislocation). They find that a more equitable distribution of education increases institutional trust and decreases social exclusion. Education also fosters greater political and civic participation—such as voting and volunteering.

Furthermore, education is a proven means of reducing crime rates in the population. Vocational qualifications can provide the economic resources (via higher earnings and better job opportunities) that reduce incentives to engage in crime. Data linking educational attainment to crime rates are not available in Australia, and we have not attempted to calculate the fiscal savings of reduced crime. Nevertheless, the Australian Institute of Health and Welfare (2018, 2019a, 2019b) shows that low educational attainment is a strong predictor of involvement in the criminal justice system. Baldry et al. (2018) find that lower levels of educational attainment are associated with poorer employment opportunities and outcomes, generating higher unemployment that is, in turn, a risk factor for incarceration and for reoffending post-release.

To the extent, therefore, that vocational education provides job pathways for more at-risk groups (who disproportionately rely on TAFE programs), there are significant benefits in crime reduction due to the TAFE system.

All of these broader social benefits resulting from high-quality public vocational education, and the operation of the TAFE system specifically, are difficult to quantify in dollar terms. But they must form part of our understanding of the broader effects of TAFEs in building not just a stronger labour market, but a stronger society.

Comparing the Costs and Benefits

Earlier, we reviewed a range of cost-benefit studies that have considered the net economic impacts of education systems. Some of the key findings of these reports include KPMG's finding (2018a, 2018b) find that the TAFE system returns $2.55 value to the Queensland economy for every $1 invested there, and $2.19 to the Victoria economy for every $1 investment there. The broader adult and community education sector is found to yield a net benefit to the community and individuals exceeding $3 billion per year (Birch et al., 2003). For every $1 spent on early childhood education, an additional $2 in economic benefits is generated (The Front Project, 2019). Finally, apprenticeships in the UK and schools in Canada were also found to deliver major net benefits to those national economies.

Table 14 summarises the economic benefits we have estimated, through the various 'streams' of economic impacts. As discussed earlier, TAFE institutes generate $6.1 billion per year in direct spending on their operations and associated upstream and downstream impacts across the broader national and regional economies: including direct value-added, supply chain purchases, and downstream consumer spending. The TAFE-trained workforce also generates $84.9 billion per year in ongoing labour market benefits from TAFE – consisting of higher earnings for VET-qualified workers, increased productivity and profits for employers, and higher tax revenues to government. We also trace important fiscal savings to government resulting from a more engaged and healthier TAFE-trained workforce, valued at $1.5 billion per year. Across these three streams alone, and not counting the other, hard-to-quantity social impacts discussed above, we argue that Australia's current and historical investments in TAFE-provided vocational education are supporting a massive annual flow of economic benefits, worth some $92.5 billion in 2019.

Table 14
Summary of Economic Benefits

Economic Benefits of TAFE Production	$6.1 billion
Higher Earnings & Productivity —Additional Tax Revenues	$84.9 billion ($25 billion)
Lower Welfare and Health Spending	$1.5 billion
Total Benefit	**$92.5 billion**

Over Australia's post-war history, the TAFE system made by far the largest contribution to VET: we estimate that 72.5% of Australia's current VET-qualified workforce obtained their qualification from a TAFE institute. There is no doubt that the labour market benefits

resulting from this accrued stockpile of TAFE-educated workers make an outsized and continuing contribution to our national prosperity, despite the neglect and mismanagement which have characterised governments' approach to the TAFE system more recently.

Our historic investment in high-quality TAFE education supports an ongoing flow of economic benefits that were worth $92.5 billion to the Australian economy in 2019. Combined economic benefits generated by the TAFE system are broadly shared by many sectors: workers, employers, government and communities. As described above, some of these benefits are received by employees, including $49.3 billion in higher wages per year, while some are received by employers through superior productivity valued at $35.6 billion per year. In addition, government avoids $1.2 billion in annual welfare expenditures and $289 million in healthcare costs. We estimate that the TAFE system has increased employment among its graduates by around 486,000, and reduced unemployment by 65,000 (both compared to workers with no post-school qualifications).[52]

On balance, these economic benefits generated by Australia's historic investments in TAFE education – and received by individuals, employers, the government and wider society – far outweigh the ongoing costs of maintaining the TAFE system, that we also outlined earlier in this paper. The total combined costs for delivering VET through TAFE institutes in 2018 were modest—only $5.7 billion, just one-quarter of 1% of Australia's annual GDP. In other words, the ongoing flow of economic benefits generated by the TAFE system are some 16 times greater than the annual 'maintenance' costs which Australia is currently reinvesting in the TAFE system. The incremental taxation revenues generated as a result of the superior productivity and incomes of TAFE graduates alone are worth $25 billion per year: 4.4 times more than the amount currently allocated to the costs of running the TAFE system.

However, that current rate of investment in TAFE is clearly inadequate to maintain the stock of high-quality TAFE-trained skilled workers. As documented above, the TAFE system is in crisis because of fiscal austerity, privatisation, and other policy failures. Without urgent action to repair and rebuild the system, that massive ongoing flow of benefits will quickly erode – as the current population of TAFE-trained skilled workers reaches retirement age, and is not fully replaced by cohorts of younger graduates. In that regard, the costs of inaction in repairing the TAFEs, as part of a broader reorganisation and repair of VET policy more broadly, will quickly escalate.

There is an obvious analogy to other situations in which a person or community reaps ongoing benefits from a prudent previous investment – but then neglects to adequately maintain the value of that asset, and hence ultimately forgoes the value that it could

[52] As discussed above, the increase in employment among TAFE graduates is much larger than the reduction in unemployment, because the main source of improved employability among TAFE graduates is via their much higher rates of labour force participation (supplemented by a more modest reduction in unemployment among those in the labour force).

otherwise produce. Imagine a house: a family makes a major investment to purchase it, and then enjoys a flow of benefits (resulting from its usefulness as a residence, or perhaps even its value as a rental property). If that house is not maintained, then it will gradually become incapable of continuing to provide those benefits. The wealth-generating potential of what was once a productive asset is squandered.

In this case, the productive 'asset' is the stock of TAFE-trained workers, with their superior employability, productivity, incomes and tax payments. The 'house' that TAFE institutes built in past decades, through high-quality, trusted vocational training, is crumbling. If Australia wants to continue to reap the benefits of those workers, and the next generations of skilled workers who must eventually take their places, then we must restore and repair the 'house'.

In other words, Australia must quickly step up its collective investments in the TAFE system to maintain the benefits of a well-skilled technical workforce, and to ensure that that ongoing $92.5 billion flow of annual quantifiable benefits (let alone the other, broader social gains) continues. We are not investing enough to maintain the productive capacity of the TAFE-trained workforce we need; we will pay a steep price for that failure in many ways, including worsening skills shortages, reduced participation and employability, stagnant productivity, and stagnant earnings. Indeed, all those signs of labour market dysfunction, and more, are readily visible in Australia today.

Public investments in the TAFE system must therefore be expanded well beyond their current, depressed scale. Previous funding cuts and the privatisation of so much VET activity are already clearly undermining the ongoing flow of the benefits described above – as evidenced by the downsizing of TAFE institutes and staff, the loss of hundreds of thousands of apprenticeships and traineeships, and the historic plunge in the overall rate of VET participation. As Australia confronts the urgent task of rebuilding the VET system in the wake of the COVID-19 pandemic and resulting recession, it is essential that we repair and expand the TAFEs, as the reliable centrepiece of a renewed and modernised vocational education system – lest we 'kill the goose that lays the golden egg'.

Conclusion and Recommendations

The COVID-19 pandemic and resulting economic crisis presents the most significant economic and social challenge to Australia in decades. Australia needs a comprehensive, public-led national reconstruction program that dramatically expands our productive capacity, the number of good jobs, and quality public services like the TAFE system. Mass public investment in the skills and earning capabilities of Australian workers will pave our post-COVID road to recovery.

This report affirms the necessity of moving ahead quickly with the fundamental repair of the overall VET system in Australia. That rebuilding task must start with repairing and revitalising TAFE, as the trusted, accountable and accessible anchor institutions of Australia's vocational training infrastructure. Despite years of funding cuts, the TAFE system continues to make a strong and disproportionate economic and social contribution to the Australian economy. The combined economic and social benefits arising from both the direct activity of TAFE and the larger skilled higher-earning workforce that it creates are enormous. We estimate the total economic benefits arising from just some of the channels we have considered at $92.5 billion per year. There are other important but non-quantifiable social benefits (including accessibility, regional economic development, and social cohesion) that also must be kept in mind.

We make the following recommendations for specific actions to resolve the broader crisis in vocational education, and to allow the TAFEs to once again play their full, critical role in the reconstruction of the national economy after COVID-19:

- The government should re-establish an adequately funded and stable TAFE system as the centrepiece of a revitalised Australian VET sector. Disruption to the VET skills pipeline caused by the expansion of unaccountable private providers has deeply damaged employer and public confidence in the system. As the longest-serving, most experienced and trusted VET delivery system in Australia, the TAFE institutes are best positioned to rebuild the VET skills pipeline and support the mass labour market transitions precipitated by the COVID-19 economic crisis. Fulfilling its critical role as the major provider of vocational education requires that a minimum 70% of total VET public funding be provided to TAFE institutes, rather than funnelled (directly or indirectly) to private providers.

- We need a new model of VET funding to end the clear disjuncture between universities and the VET system – whereby prospective students face clear fiscal incentives to choose university education over VET training, regardless of whether that is most appropriate for their personal attributes or career prospects. This disjuncture underpins ongoing failures to undertake long-term, coherent planning in the overall tertiary

education sector. The new model of funding should reverse declining VET participation trends and create a more cohesive and coordinated post-school education system.

- Mass youth unemployment requires additional long-term, sustained investments in repairing jobs pathways for youth. The Commonwealth Government should undertake a new free TAFE program to provide free TAFE courses in priority areas. This program would include Commonwealth support for existing free TAFE programs in Victoria and NSW. A program supporting 300,000 public-paid TAFE positions per year would cost around $2 billion per year.

- Public-supported apprenticeships and traineeships should be dramatically expanded, coordinated through TAFE institutes. To support the uptake of apprentices in employment, the Commonwealth Government should offer a 50% wage subsidy for employed apprentices, on the condition that they are still employed with their host employer one year after program completion. A program supporting 100,000 subsidised apprenticeships would cost about $2.5 billion per year.

- Since the VET sector will be 'rudderless' when it comes to establishing future skills frameworks until governments develop a long-term industry policy agenda, TAFE institutes should be engaged as active and central stakeholders in developing and implementing a new generation of industry policy. Strategic, advanced, innovative and high-value industries must be identified and nurtured to renew productivity growth, improve export quality and boost research and innovation (which has perversely diminished in Australia in recent years). Integration of skills and active sectoral development policies can help turn back the clock on declining employer investment in education and training, and it can also encourage partnerships on customised joint training initiatives between specific TAFE institutes and firms or groups of firms. The TAFE system can also serve as a source of high-quality employment opportunities for VET graduates.

- Stronger regulation and quality assurance should determine the sustainability and quality of existing publicly subsidised private providers. It should not be possible for new additional private VET providers to be registered within this already-crowded, uncoordinated sector.

- A comprehensive assessment of the post-school system should be undertaken. The absence of integrated policy coordination across the two post-secondary education systems has disrupted skills pathways for many young Australians. Prospective students should be encouraged to consider VET study in the TAFE system alongside traditional academic alternatives.

Rebuilding the economy after COVID-19 will take many years, but that historic challenge will take even longer without a strong, coordinated, public-funded VET system to facilitate job

transitions and open opportunities for young workers. Billions of dollars in public funding have been wasted trying to build an inefficient, uncoordinated private VET training market that has failed workers, business and government alike. The TAFE system is the most experienced, reliable and high-quality national-level vocational training infrastructure, and it is therefore best positioned to lead the VET sector response to skills system reconstruction.

This study has demonstrated that accumulated public investments in the TAFE system continue to deliver significant economic, fiscal and social benefits to the nation. Australia must now protect and extend these investments. Our recommendations are aimed at rebuilding a VET system anchored by public-funded TAFE institutes, thus putting Australia in the best possible position on its turbulent journey to skills system reconstruction.

Appendix

This Appendix provides more detail on the methodology and data sources utilised in the benefit calculations described in this report.

DERIVING TAFE'S SHARE OF VET-QUALIFIED WORKERS

In some cases, the labour market benefits accruing to workers (and their employers) holding VET qualifications are not disaggregated statistically according to the specific source of that credential (that is, whether it came from TAFE or some other form of institution).

We have therefore adopted the following methodology to estimate the proportion of VET graduates currently in the Australian labour force, who received their qualifications from a TAFE institute. Data were obtained on the total flow of VET students by year from 1981 through to 2018.[53] For the period after 1995, VET enrolment data describe the proportion of VET students who are enrolled in TAFEs and other government-funded institutions. For the period prior to 1995, we assume that this proportion averaged 85%.[54] We adjust the flow of VET students in each year by the labour force participation rate corresponding to their present age (from ABS Catalogue 6291.0.55.001, Table 1).

We also adjust the annual flow of VET students by a survival rate (obtained from the ABS life expectancy tables, Catalogue 3302.0.55.001) to reflect the proportion of VET students in each year who have survived to the present.[55] For this step, we use the life expectancy table for 2001 (approximately the mid-point of the timeframe covered by our sample; using year-specific life-tables would make very little difference to the estimate). From this annual flow of surviving, participating VET graduates (disaggregated into TAFE and non-TAFE qualifications), we cumulate an estimated stock of VET graduates (again disaggregated into TAFE and non-TAFE categories).

The estimated proportion of TAFE-qualified VET students in that overall cumulative stock of VET-qualified workers is 72.5%. We use that parameter to scale the number of currently employed Australian workers with VET qualifications, to estimate the proportion who received their qualifications from a TAFE institute or another government-funded body.

[53] The labour force participation rate of people who graduated from VET prior to 1981 is low, and so we do not include that group. This is a conservative assumption in terms of the likely share of TAFE graduates, since VET prior to 1981 was dominated by TAFEs.

[54] In 1996, TAFEs accounted for 83% of VET students. That proportion was higher in earlier years, when TAFEs dominated vocational education in Australia. This assumption is conservative, and it likely understates the proportion of TAFE students in those earlier years.

[55] This adjustment is only important for VET graduates from the very early years of our analysis.

TAFE institutes are the dominant provider of government-funded VET (comprising 92% of all public-funded students in 2018) with a smaller number of other government providers including community education providers. This estimate takes account of the changing flow of total VET activity over time, the changing importance of TAFE versus non-TAFE providers, and variability in both longevity and labour force participation for various age cohorts.

For the various reasons described above, this approach likely underestimates the true proportion of TAFE graduates in all VET qualification-holders—and hence underestimates the current economic benefits arising from past TAFE education activity.

CALCULATING UNEMPLOYMENT & BENEFIT PAYMENTS

We use the following method to calculate the reduction in unemployment resulting from workers receiving VET qualifications. Unemployment rates for highest education attainment level are provided by ABS labour force data.[56] An unemployment rate for VET-qualified workers is calculated by adding up those with Advanced Diplomas, Diplomas and Certificates III/IV. An unemployment rate for those with no post-school qualifications is similarly calculated as the sum of all workers with Year 12 equivalent or below. No data are available for Certificate I/II level VET qualifications, so they are not considered in the comparison.[57]

Table A1
Actual and Counterfactual Unemployment by Qualification (2019)

	Labour Force (000)	Unemployment (000)	Unemployment Rate (%)	Unemployment at No-Post-School Rate (000)	Difference (000)
VET-Qualified	3831.5	159.9	4.17%	249.4	89.5
No Post-School Qualification	3645.6	237.3	6.51%		
TAFE					64.9

Source: Author's calculations from ABS Catalogue 6291.0.55.003, Table 24b. Includes ages 20–64 only.

We assume that if workers with an Advanced Diploma, Diploma or Certificate III/IV did not have that qualification, they would face a higher unemployment rate on par with those without post-school qualifications. Their achievement of VET qualifications has thus reduced

[56] ABS Catalogue 6291.0.55.003, Table 24b. Includes ages 20–64 only.

[57] Most research indicates that there is little difference in employment and earnings outcomes between workers holding Certificates I/II and those without post-school qualifications.

unemployment by a total of 89,500 in 2019 (see Table A1). As explained above, only a portion (72.5%) of that reduction in unemployment is attributable to TAFE training (since some VET-qualified workers received their training through other streams). The total reduction in unemployment attributed to TAFE is 64,880.

We then consider the rates of unemployment support payments. At the time of writing, this payment was Newstart Allowance, however, the payment was renamed 'JobSeeker' and an additional Coronavirus Supplement payment was introduced as part of the Commonwealth government's COVID-19 response. We estimate the value of a reduction in welfare payments based on the pre-crisis Newstart base rate (i.e. not including the Coronavirus Supplement). However, we include other additional supplementary payments received by almost all (99%) recipients of Newstart Allowance pre-crisis (including the Carer Payment, Remote Area Allowance, transport allowances and the Energy Supplement).

Table A2 presents the schedule of Newstart Allowance and related payments for unemployed people, and estimates the total number of recipients receiving each tier of benefits (based on information provided by government during June 2017 Senate Estimates; see Henriques-Gomez, 2019). In addition to the basic Newstart Allowance, 52% of recipients received an additional weekly payment of $7.30 through the Clean Energy Supplement; 28% received an additional $55.18 per week through both the Clean Energy Supplement and Rent Assistance payments; and around 20% received an additional $240 per week through Family Tax Benefit and other supplements.

Departmental data for July 2019 record 710,000 Newstart Allowance recipients (similar to the 2017 level). Therefore, we apply the 2017 results for both the number of Newstart Allowance recipients receiving benefits today and the proportion of all recipients receiving additional payments to 2019. Since the loaded Newstart Allowance rates obtained from the 2017 Senate Estimates process are a composite average arising from a combination of non-specified supplementary payments, we increase all loaded Newstart Allowance payments by CPI (to account for indexation of benefits between 2017 and 2019).[58] Newstart Allowance–only rates were obtained from the Department of Social Services (2020).

We then take the number of potential unemployed persons scaled for TAFE and apply the different loaded benefit rates depending on the proportion of overall Newstart Allowance recipients who receive those additional payments. From this we can calculate an annual cost saving representing the reduced flow of unemployment benefits to TAFE-trained workers. We estimate that 64,880 fewer people who were unemployed in 2019 because of their TAFE qualification, and this generated a total annual saving of $1.2 billion to government in reduced welfare benefit costs.

[58] Newstart Allowance is indexed to prices.

Table A2 Unemployment Benefit Recipients by Additional Payments						
	Estimated Total Recipients 2019	**Average Cost of Additional Payments**	**% of Total Newstart Allowance Recipients**	**Payment per Recipient ($2019)**	**Estimate of # of Below-TAFE Recipients**	**Annual Cost Savings ($2019 million)**
Newstart Only	5000	-	1%	$279.5	649	$9.5
Newstart and Supplement Payments	380,544	$11.4	52%	$290.9	33,738	$511.7
Newstart, Supplement Payments and Rent Assistance	207,852	$52.98	28%	$338.8	18,166	$320.9
Newstart, Family Tax Benefit and Other Supplements and Payments*	138,508	$244.1	19%	$523.6	12,327	$336.5
Total TAFE					**64,880**	**$1178.6**

Source: Newstart Allowance and additional payments data in Henriques-Gomez (2019). Department of Social Services (2020) for 2019 payment rates. Single, no children rate $279.50 per week; single with dependent children rate used for Family Tax Benefit recipients of $302.35 per week. All additional payments increased by CPI. 'Supplement payments' cover a range of payments including Carer Payment, Remote Area Allowance, transport allowances and the Energy Supplement. Annual cost assumed payments received all year (52.14 weeks). TAFE proportion of total VET welfare benefit saving estimated at 72.5%.
*'Other supplements and payments' represent the average of Rent Assistance and supplementary payment recipients also receiving Family Tax Benefit.

CALCULATING HEALTHCARE SAVINGS BENEFITS

To calculate government savings on healthcare spending due to the improved health outcomes of TAFE graduates, we estimate the number of people with VET post-school qualifications who otherwise would be likely to have long-term health conditions if they had not attained that further education. Mitchell Institute research finds that 42% of male and

female school leavers in the working-age population have a long-term health condition, compared to only 26% of the general working-age population (Lamb & Huo, 2017). The authors do not report a long-term health condition rate for workers with educational attainment above school leavers. Since the 26% rate for the general population also includes school leavers, the 16% difference likely understates the true health advantages of holding a VET qualification over school leavers.

To calculate the number of VET-qualified workers who would have had a long-term health condition had they not attained Year 12 or other post-school qualifications, we use Census 2016 (most recent) population data, since the positive effects of attaining VET qualifications (such as higher lifetime earnings) continue to impact the health outcomes of people well after working life. We estimate that around 750,000 additional workers with VET qualifications would have a long-term health condition if they had not attained Year 12 or any post-school qualifications. Given the absence of information about the average costs of long-term health conditions to healthcare budgets (and the multitude of health outcomes), we do not calculate the costs of a typical long-term health condition.

Instead, we calculate the cost of long-term health conditions based on the average number of annual GP visits. This method is informed by a UK study by Windmeijer and Santos Silva (1997), who find that individuals with higher vocational degrees were less likely to visit their GP than individuals with no post-school qualifications. We use publicly available Medicare rebate data to estimate the value of reduced demand to access public-subsidised (or bulk-billed) GPs. The national public healthcare system—Medicare—provides rebates to GPs for 100% of the Schedule fee per consultation. The Schedule fee was $38.20 per consultation in 2019, including 1.5% indexation (Department of Health, 2018). Many doctors charge more than the Schedule fee, with additional 'gap fees' passed onto patients. In both cases, where clinics bulk-bill patients (with no additional fees) or where they charge gap fees, the Schedule fee represents the full cost of each GP visit to government. Public health data indicate that the average Australian visits the GP six times per year.[59] We assume that persons with long-term health conditions present to GPs 50% more often than the working population average (total of nine visits per year).

We estimate the healthcare cost saving based on *both* an increase in the number of people presenting to GPs, and an increase in number of GP visits for that group. We then scale the total fiscal saving benefit by the estimated percentage of all employees holding VET qualifications who received those qualifications from TAFE (72.5%). The total annual reduction in health-related costs arising from TAFE qualifications is thus estimated at $289 million. More detail of the annual healthcare savings is provided in Table A3.

[59] Independent Hospital Pricing Authority (2019*), National Hospital Cost Data Collection Report; Public Sector, Round 21* (Financial Year 2016–17), Table 4. Average cost per episode. Average GP visit data from The Australia Institute of Health and Welfare (2019a).

Table A3 Annual Healthcare Savings								
	Total Population	**Total Population with Long-Term Health Condition (26%)**	**Number of VET People with Long-Term Health Condition if 42% Rate**	**Total People in Better Health**	**GP Visits at 26% Rate (6 per year)**	**GP Visits at 42% Rate (9 per year)**	**Total Annual GP Visits Reduced**	**Total Annual Saving ($ Million)**
Certificate I and II Level	16,196	4211	6802	2591	25,266	61,221	35,955	1.4
Advanced Diploma and Diploma Level	15,462	4020	6494	2474	24,121	58,446	34,326	1.3
Advanced Diploma and Associate Degree Level	721,054	187,474	302,843	115,369	1,124,844	2,725,584	1,600,740	61.1
Diploma Level	951,406	247,366	399,591	152,225	1,484,193	3,596,315	2,112,121	80.7
Certificate III and IV Level	2,995,132	778,734	1,257,955	479,221	4,672,406	11,321,599	6,649,193	254.0
Total	**4,699,250**	**1,221,805**		**751,880**	**7,330,830**	**17,763,165**	**10,432,335**	**398.5**
Scaled for TAFE (72.5%)	**3,406,956**							**288.9**

Source: Population by highest educational attainment from ABS Census (2016). Cost of 'GP visits' set at $38.20 as per Department of Health (2018) *Indexation of Medicare Benefits Schedule (MBS) items from 1 July 2018*. Annual average GP visit data from The Australia Institute of Health and Welfare (2019a).

References

Australian Education Union (2020). *National Survey Reveals Budget-cut Impact to TAFE* (Available at: http://www.aeufederal.org.au/news-media/media-releases/2020/jul/090720).

Australian Industry Group (2004). *Australia's Skills Gap: Costly, Wasteful and Widespread* (Sydney: Australian Industry Group).

Australian Industry Group (2018). *Skilling: A National Imperative*, Survey report (Sydney: Australian Industry Group).

Australian Institute of Health and Welfare (2018). *Australia's Health* (Canberra: Commonwealth Government).

Australia Institute of Health and Welfare (2019a). *Healthy Community Indicators* (Available at: https://www.aihw.gov.au/reports-data/indicators/healthy-community-indicators).

Australian Institute of Health and Welfare (2019b). *The Health of Australia's Prisoners 2018* (Canberra: Commonwealth Government).

Auwalin, I., N. Alick, and K. Siwaporn (2019). 'Labour Supply and Skills Shortages in Australia', *The 2nd International Conference on Islamic Economics, Business, and Philanthropy* (ICIEBP), KnE Social Sciences, pp. 1249–65.

Baldry, E., D. Bright, J. Cale, A. Day, L. Dowse, and M. Giles (2018). *A Future Beyond the Wall: Improving Post-Release Employment Outcomes For People Leaving Prison: Final Report* (Sydney: UNSW Sydney).

Birch, E., P. Kenyon, P. Koshy, and N. Wills-Johnson (2003). *Exploring the social and economic impacts of adult and community education* (National Centre for Vocational Education Research (NCVER)).

Borland, J. (2020). 'COVID-19 and the Australian Labour Market: What Do the Data Tell Us Happened between March and April?', Labour market snapshot #60, Department of Economics, University of Melbourne.

Burke, G. (2018). *Changes in Funding in Australian Vocational Education and their Effects* (Melbourne: L.H. Martin Institute, University of Melbourne).

Centre for Economics and Business Research (CEBR) (2014). *Economic Impact of Apprenticeships: A CEBR Report for the Skills Funding Agency* (London: CEBR).

City & Guilds Group (2015). *The Economic Benefits of Vocational Education and Training in the UK*.

Commonwealth Government (2019). *Financial Support for Australian Apprentices* (Available at: https://www.australianapprenticeships.gov.au/aus-apprenticeships-incentives).

Conference Board of Canada (2019). 'The Economic Case for Investing in Education', prepared for Ontario Secondary School Teachers' Federation, June.

Conlon, G., and P. Patrignani (2013). *A Disaggregated Analysis of the Long Run Impact of Vocational Qualifications,* BIS Research Paper Number 106.

Dearden, L., H. Reed, and J. Van Reenen (2005). 'The Impact of Training on Productivity and Wages: Evidence from British Panel Data', *Economic History Working Papers*, London School of Economics and Political Science, Department of Economic History.

Deloitte Access Economics (2019). *The Path to Prosperity: Why the Future of Work is Human* (Sydney: Deloitte Touché Tohmatsu).

Department of Education (2016). *Redesigning VET FEE-HELP: Discussion Paper* (Canberra: Department of Education).

Department of Education and Training (2015). *Selected Higher Education Statistics—2015 Student Data* (Canberra: Department of Education and Training).

Department of Education and Training (2017). *Selected Higher Education Statistics—2017 Student data and uCube* (Canberra: Department of Education and Training).

Department of Education, Skills and Employment (2019). *Historical List of Skill Shortages in Australia* (Canberra: Department of Education, Skills and Employment).

Department of Health (2018). *Indexation of Medicare Benefits Schedule (MBS) Items from 1 July 2018* (Canberra: Australian Government).

Department of Social Services (2016). *Youth Allowance Payment Trends and Profiles Report—June 2016* (Canberra: Department of Social Services).

Department of Social Services (2016). *Payment Trends and Profiles Report - June 2016* (Canberra: Department of Social Services).

Department of Social Services (2020). *How Much Can You Get* (Available at: https://www.servicesaustralia.gov.au/individuals/services/centrelink/newstart-allowance/how-much-you-can-get).

Feinstein, L., R. Sabates, T.M. Anderson, A. Sorhaindo, and C. Hammond (2006). 'What are the Effects of Education on Health? Measuring the Effects of Education on Health and Civic Engagement', *Proceedings of The Copenhagen Symposium*, OECD.

Ferguson, H., and M. Harrington (2019). *Education and Training: Budget Review 2019–20 Index* (Canberra: Parliament of Australia, available at https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201920/EducationTraining).

Flanagan, F. and F. Stilwell (2018). "Editorial: Causes and Consequences of Labour's Falling Income Share and Growing Inequality," *Journal of Australian Political Economy* 81, pp. 5-10.

Fortin, P., L. Godbout, and S. St-Cerny (2018). 'Impact of Quebec's Universal Low-Fee Childcare Program on Female Labour Force Participation, Domestic Income, and Government Budget'.

Gong, X., and R. Tanton (2018). *Returns to Education in Australia 2006–2016* (Canberra: National Centre for Social and Economic Modelling (NATSEM), University of Canberra).

Hawke, G. (1998). 'Learning, Workplaces and Public Policy', in J. McIntyre and M. Barrett (Eds.), *VET Research: Influencing Policy and Practice,* Proceedings of the First National Conference of the Australian Vocational Education and Training Research Association, Sydney.

Hayward, H., E. Hunt, and A. Lord (2014). *The Economic Value of Key Intermediate Qualifications: Estimating the Returns and Lifetime Productivity Gains to GCSEs, A Levels and Apprenticeships*, Research Report, December.

Henriques-Gomez, L. (2019). 'Newstart: What are the Facts about the Unemployment Payment?', *The Guardian,* 15 May.

Independent Hospital Pricing Authority (2019). *National Hospital Cost Data Collection Report; Public Sector, Round 21 (Financial Year 2016–17)* (Available at https://www.ihpa.gov.au/publications/national-hospital-cost-data-collection-report-public-sector-round-21-financial-year).

Lamb, S., and S. Huo (2017). *Counting the Costs of Lost Opportunity in Australian Education,* Mitchell Institute Report No. 02/2017.

Leigh, A. (2008). 'Returns to Education in Australia', *Economic Papers*, vol. 27, no. 3, pp. 233–49.

Long, M., and C. Shah (2008). *Private Returns to Vocational Education and Training Qualifications* (Prepared for National Centre for Vocational Education Research (NCVER). Centre for the Economics of Education and Training, Monash University).

Knight, G., I. White, and P. Granfield (2020). *Understanding the Australian Vocational Education and Training Workforce* (National Centre for Vocational Education Research).

KPMG (2018a). *The Importance of TAFE Queensland to Queensland's Prosperity. November* (Melbourne: KPMG).

KPMG (2018b). *The Importance of TAFE to Victoria's Prosperity* (Melbourne: KPMG).

Lanvin, B., and F. Monteivo (2020). *Global Talent Competitiveness Index 2020: Global Talent in the Age of Artificial Intelligence* (Report prepared on behalf of Insead, Google & Adecco).

Leal, H. (2019). 'Firm-level Insights into Skills Shortages and Wages Growth', *RBA Bulletin*, Reserve Bank of Australia, March.

Macintyre, S. (2015). *Australia's Boldest Experiment: War and Reconstruction in the 1940s* (Sydney: NewSouth Publishing).

Maxwell. R. (2018). *How Employers Can Play A Role in Averting Australia's Skills Shortage* (Bathurst: Verto).

Mitchell Institute (2020). 'New Modelling Warns Youth Unemployment to Skyrocket as Apprenticeships Disappear', Mitchell Institute (available at http://www.mitchellinstitute.org.au/news/new-modelling-warns-youth-unemployment-to-skyrocket-as-apprenticeships-disappear/).

National Australia Bank (NAB) (2017). 'Skills Shortage Holding Back Australian Business', National Australia Bank, 5 September.

National Centre for Vocational Education Research (NCVER) (2018). *Historical Time Series of Government-Funded Vocational Education and Training From 1981 to 2018* (Adelaide: NCVER).

National Centre for Vocational Education Research (NCVER) (2019a). *Total VET Students and Courses 2018* (Adelaide: NCVER).

National Centre for Vocational Education Research (NCVER) (2019b). *VET Student Outcomes* (Adelaide: NCVER).

National Centre for Vocational Education Research (NCVER) (2019c). *Australian Vocational Education and Training Statistics: Government Funding of VET 2018—Data* (Adelaide: NCVER).

Noonan, P. (2016). *VET Funding in Australia: Background, Trends and Future Directions* (Melbourne: Mitchell Institute).

Noonan, P., and S. Pilcher (2018). *Participation in Tertiary Education in Australia: Modelling and Scenario Analysis* (Melbourne: Mitchell Institute).

O'Dwyer, L., and I. White (2019). *The Dynamics of Qualifications: Implications for VET* (Adelaide: National Centre for Vocational Education Research).

Organisation for Economic Co-operation and Development (OECD) (2010). *Learning for Jobs* (available at: http://www.oecd.org/education/skills-beyond-school/Learning%20for%20Jobs%20book.pdf).

Organisation for Economic Co-operation and Development (OECD) (2016). 'Investing in Youth: Australia', *Investing in Youth* (Paris: OECD Publishing).

Organisation for Economic Co-operation and Development (OECD) (2020). 'Youth Not in Employment, Education or Training (NEET)', indicator.

Pilcher, S., and K. Torii (2017). *Expenditure on Education and Training in Australia 2017*, Report No. 05/2017 (Mitchell Institute, Victoria University).

Preston, J., and A. Green (2003). *The Macro-Social Benefits of Education, Training and Skills in Comparative Perspective*, Wider Benefits of Learning Research Report No. 9 (Centre for Research on the Wider Benefits of Learning).

Prime Minister of Australia (2020). 'JobTrainer Skills Package for Economic Recovery and Growth,' 16 July (Available at: https://www.pm.gov.au/media/jobtrainer-skills-package-economic-recovery-and-growth).

Productivity Commission (2011). *Vocational Education and Training Workforce* (Canberra: Productivity Commission).

Productivity Commission (2020a). *Report on Government Services 2020* (Canberra: Productivity Commission).

Productivity Commission (2020b). *National Agreement for Skills and Workforce Development Review* (Canberra: Productivity Commission).

Quality Indicators for Learning and Teaching (2019). *2019 Graduate Outcomes Survey.*

Quiggan, J. (2018). 'The Failure of Vocational Education and Training Policy in Australia', submission to the Senate Education and Employment References Committee Inquiry into Vocational Education and Training in South Australia, January.

Redrup, Y. (2017). 'Skills Shortage Risks $139b Digital Economy', *Australian Financial Review*, 23 May (Available at: https://www.afr.com/technology/skills-shortage-risks-139b-digital-economy-deloitte-access-economics-and-acs-20170518-gw7hcc).

Rice, J.M., D. Edwards, and J. McMillan (2019). *Education Expenditure in Australia* (Canberra: Australian Council for Education Research).

Richardson, S. (2007). *What Is A Skill Shortage?* (Adelaide: National Centre for Vocational Education Research).

Ryan, C.A. (2002). *Individual Returns to Vocational Education and Training Qualifications: Their Implications for Lifelong Learning* (Adelaide: NCVER).

Stanford, J. (2018). 'The Declining Labour Share in Australia: Definition, Measurement, and International Comparisons', *Journal of Australian Political Economy*, no. 81, pp. 11–32.

Stanwick, J., O. Koon, and T. Karmel (2006). *Vocational Education and Training, Health and Wellbeing: Is There a Relationship?* (National Centre for Vocational Education Research).

TAFE Directors Australia (2019). *VET Reform and Joyce Review* (Available at: https://staging.tda.edu.au/wp-content/uploads/2020/01/VET-Reform-Joyce-Review.pdf).

Tertiary Education Quality and Standards Agency (TEQSA) (2016). *Key Financial Metrics on Australia's Higher Education Sector—2nd edition* (Melbourne: TEQSA).

Tertiary Education Quality and Standards Agency (TEQSA) (2018). *Key Financial Metrics on Australia's Higher Education Sector—4th edition* (Melbourne: TEQSA).

The Front Project (2019). *A Smart Investment for a Smarter Australia: Economic Analysis of Universal Early Childhood Education in the Year Before School in Australia* (Prepared by PwC), June.

Toner, P (2018). 'A Tale of Mandarins and Lemons: Creating the Market for Vocational Education and Training', in D. Cahill and P. Toner, *Wrong Way: How Privatization and Economic Reform Backfired* (Carlton, Vic: LaTrobe University Press), pp. 59–84.

Victorian Registration and Qualifications Authority (2017). *Minimum Hours for Employment and Training Policy* (Victoria Government).

Wheelahan, L. (2018). 'New Figures Quantify the Extent of the TAFE Disaster', *Stop TAFE Cuts*, blog post, 23 June (Available at: https://www.stoptafecuts.com.au/blog/newfigures-quantify-extent-tafe-disaster).

Wilkins, R., and I. Lass (2018). *The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 16* (Melbourne Institute of Applied Economic and Social Research, University of Melbourne).

Windmeijer, F. A., and J. M. C. Santos Silva (1997). 'Endogeneity in Count Data Models: An Application to Demand for Health Care', *Journal of Applied Econometrics,* no. 12, pp. 281–294.

Yu, S., and D. Oliver (2015). *The Capture of Public Wealth by the For-Profit VET Sector* (Sydney: Workplace Research Centre).

Zoellner, D. (2019). 'Beyond Community Service Obligations: The Institutional Logics and Public Value of TAFE', TAFE Directors Australia, Canberra.