

The impact of COVID-19 on industry innovation, skills and the need for training

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About the research

The impact of COVID-19 on industry innovation, skills and the need for training

Lisel O'Dwyer, NCVET

The economic impact of the COVID-19 pandemic has been felt in some industries more than in others. Individual businesses within industry sectors have also responded in different ways. Some businesses with products relevant to the pandemic have capitalised on the situation by making innovations in their products and in their operations. Many others have merely adapted to the changed conditions, making changes to survive while under intense strain, as a result of reduced demand, disrupted supply chains and labour shortages.

Using semi-structured interviews in three case study industries (manufacturing; healthcare; and hospitality and tourism), this research documents the different ways by which businesses have responded to the pandemic and the extent to which innovation was an element of their response. It identifies the implications for the vocational education and training (VET) sector in providing training for any new skills needed for innovation under pandemic conditions.

Key messages

- Most businesses *adapted* to changing conditions during the pandemic, rather than *innovated*.
- A limited amount of training was required for the innovations or adaptations made, with most staff able to transfer existing skills to any new tasks.
- Where training was undertaken, it was mostly unaccredited and done informally on the job or via free online training (from government, industry associations or vendor websites). Where accredited training was used, such as in the aged care sector, it tended to be conducted online.
- Some businesses reported that VET was irrelevant to their needs (even pre-pandemic), while others reported that VET should be more agile or responsive to the conditions and provide training of short duration.
- Barriers to innovation during the pandemic included a lack of financial resources, limited innovation options and the conservative nature of their sector, as well as survival of the business being a higher priority. A lack of skills or inability to access training was not identified as a barrier to innovation.

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Executive summary

Innovation¹ is defined as ‘the introduction of a new or significantly improved good or service; operational process; organisational/managerial process; or marketing method’ (ABS 2020a). It can occur as a response to a sudden widespread change – such as a pandemic – and may require new or flexible skills in the short-term. For the purposes of this project, it was hypothesised that securing the skills for the new tasks associated with the innovations and adaptations resulting from the COVID-19 pandemic could be important for the survival of individual businesses, employment and economic recovery.

This project identified how businesses have innovated in their practices or markets to remain financially viable during the pandemic and whether the vocational education and training (VET) sector assisted them to equip their staff for these changes. Based on interviews with businesses in three case study industries – manufacturing, healthcare (including aged care and pharmacy), and hospitality and tourism – the research examined sectors that were substantially affected by COVID-19, in terms of trading, disruption of global supply chains, changing consumer demand, skills shortages and job losses.

Most of the businesses that were interviewed altered their usual operations in response to COVID-19 with the resultant initiatives most commonly described as adaptations (often imposed changes) rather than innovations. Both types of responses, that is, adaptations or innovations, and any subsequent need for skills development are considered in this report.

The use of VET to implement innovations/adaptations

Most of the adaptations and innovations implemented during the period of the pandemic by the case study businesses did not require training through the formal VET sector. Where training was required, it tended to be conducted through informal on-the-job training or free online training (from government, industry associations or vendor websites) rather than through accredited² VET. In many cases, workers’ existing skills could be transferred with little difficulty.

The aged care sector was the exception, where some accredited training occurred, especially in infection control. This tended to be provided online by private registered training organisations (RTOs) and was either self-funded or paid by employers.

Online training was used by some businesses to upskill in web design, new contactless booking systems or new student enrolment systems. This tended to be provided by software vendors rather than through RTOs.

A lack of skills or difficulties in accessing training was not highlighted as a barrier to innovation in any of the case studies investigated.

Outlook for VET

Interviewees from the case studies had mixed views about the ability of the VET sector to meet current training needs, whether pandemic-related or not. A common theme from all three case study industries

1 Regulatory social distancing measures, working from home and infection control are excluded from this definition. They themselves could generate innovation, however, as part of the conditions related to the pandemic.

2 Accredited training leads to vocational qualifications and credentials recognised across Australia and is provided by a registered training organisation (RTO) (Naidu, Stanwick & Frazer 2020).

was that a future role for VET may lie in developing skills in leadership and management during crises (such as the pandemic, but also including floods, drought and bushfires) rather than technical skills.

Some respondents displayed a strong preference for short intensive courses or micro-credentials, which enabled businesses to be responsive to rapid change, although this view was not shared by all respondents, with some concerned about how such an approach would address enduring skills shortages. Online training was also seen as time- and cost-effective for consumers, although limitations in that delivery mode for some aspects of training, especially for hospitality and healthcare, were acknowledged. Businesses were generally not concerned with whether available training was accredited unless this was a requirement of the job.

Innovation and adaptation through the pandemic

The pandemic had exerted substantial impacts on almost all of the businesses interviewed, with most implementing a range of responses. The types of responses reported were highly dependent on the industry and their products or services rather than other characteristics, such as the size of the business or how long it had been established.

One commonly reported response across all sectors in hospitality and tourism and in some manufacturing companies was a reduction in staffing levels. Aged care, however, required additional workers, due to high rates of absenteeism and illness amongst staff. Similarly, manufacturers of personal protective equipment (PPE) reported having to increase staffing levels to cope with increased demand. For one manufacturer, this involved using personnel from the Australian Defence Force (ADF) to meet the labour shortage, an atypical solution.

Some businesses reported that they were able to ‘pivot’³ their operations in response to the pandemic, such as from:

- manufacturing fashion clothing to personal protective clothing
- restaurant dining to the supply of home-delivered fine-dining ingredients.

These innovations were often implemented to ensure survival and represented a response to restrictions on normal trading, disruptions in usual supply chains or falling demand for their typical products or services.

Other businesses were either unable or unwilling to innovate during the crisis, as occurred with the Global Financial Crisis (GFC) (Hausman & Johnston 2014). Barriers to innovation through the pandemic included:

- lack of financial resources
- limited innovation options
- sector-wide conservatism
- survival of the business viewed as a higher priority.

Some of these businesses focused on maintaining business as usual while coping with the restrictions and affected supply chains. Examples include the manufacture of gaming machines and food products. Other

³ Pivoting in business is to fundamentally change the direction of a business when the current products or services no longer meet the needs of the market. The main goal is to improve revenue or to survive in the market (Forbes 2020).

businesses, such as dentistry and those delivering first aid training, were so severely affected by restrictions they were unable to innovate.



Innovation and adaptation due to the pandemic

The effects of the COVID-19 pandemic on businesses across Australia have varied and have been dependent on numerous lockdowns of varying degrees and durations, social distancing, and changes in demand for products and services. While there have been stories in the media of companies responding to the changed business conditions in novel ways, recent overseas research has found that innovation during COVID-19 has decreased as companies work through the crisis and focus on short-term survival issues. Innovation was a priority for 55% of businesses in pre-crisis times. In 2020, only 23% saw it as a priority (Bar Am et al. 2020).

The focus of this report is on innovations or other adaptations implemented by businesses in Australia as a result of the pandemic, and whether these generated the need for the development of new VET skills.

Adaptation (versus innovation)

Interviews with 21 business owners and peak body representatives in three Australian case study industries (manufacturing; healthcare; and hospitality and tourism) (see appendix A for methodology) showed that almost all had been substantially impacted by the pandemic and had subsequently implemented a range of responses.

Some respondents emphasised that their responses were ‘adaptations’ (changes in operations imposed by COVID-19) rather than ‘innovations’ (defined as the introduction of a new or significantly improved good or service; operational process; organisational/managerial process; or marketing method’ [ABS 2020a]). All case study industries had responded to the prevailing circumstances, with many of the measures taken aimed at keeping businesses afloat. While many of the adaptations employed are not considered innovative, they are included in this report as indicators of potential skills needs and training.

Adaptation and innovation in the case study industries

The specific innovations and adaptations reported in the three case study industries are presented below.

Several respondents suggested that the longer-term lifespan of some changes was not yet apparent. There was acknowledgement that some adaptations will be unnecessary when levels of demand change with recovery from the pandemic. Some changes, however, such as automated processes and online trading, were expected to remain post-pandemic, either permanently or at least in the long-term.

Accelerated changes were mentioned more often than postponed or impeded changes amongst the respondents from all three case study industries. While rapid change might mean ad hoc reactions or that innovations were not carefully planned, respondents unanimously saw the changes or innovations as successful. Examples include installing new equipment, converting to online trading and updating websites. The acceleration of ‘things that needed to happen’ was seen by a respondent (from a large manufacturer with international sites) as a positive impact of the pandemic, in that it built leadership capability.

Some respondents emphasised that many changes simply coincided with the pandemic and should not be considered a response. Examples include a change in business name, a grant for entrepreneurship, website and software upgrades, and a redesigned assembly process. On the other hand, for a number of businesses, some of these changes were indirectly related to the pandemic, in that reductions in business

activity made the time available. Several respondents mentioned that revitalising their websites was something they had planned to do but hadn't had the time previously.

The most common change was shedding jobs, and this occurred across all sectors in hospitality and tourism and in some manufacturing companies. Conversely, the high rates of absenteeism and illness amongst staff meant that aged care providers had to use surge staff.⁴ Other business responses included pauses on recruitment, voluntary pay cuts, reducing the number of shifts, encouraging staff on JobKeeper with insufficient work to seek other jobs, ceasing manufacture of the usual product (leading to shortages) and confining business activity to one site to remove the need for staff to travel between sites.

Manufacturing – personal protective equipment

Research on innovation in other crises suggests that larger manufacturing enterprises are more likely than smaller ones to risk investment in innovations (Archibugi, Filipetti & Frenz 2013). The pandemic, however, meant exploding demand for PPE (see, for example, Australian Department of Industry, Science, Energy and Resources 2020; Australian Department of Health 2020c), much of which is normally supplied by small-to-medium enterprises (SMEs) in Australia⁵ (Andrews 2020; Barilaro 2020).

Two main adaptations or innovations occurred due to the increased demand for PPE through the pandemic:

- Businesses that previously produced PPE increased their production.
- Manufacturers of other products pivoted to the manufacture of PPE. These reported that, under normal circumstances, they would not have competed with multinational PPE manufacturers, but because the demand was local, they had a ready market and no need to advertise.

The PPE manufacturers interviewed needed to innovate in methods and products to keep up with demand and take on more workers. One respondent previously had 15–18 full-time staff but took on approximately another 100 (although he expects to reduce this number after the pandemic).

For one manufacturer of PPE, Australian Defence Force (ADF) personnel were brought in to meet labour shortages and these personnel set examples for existing workers. The ADF personnel demonstrated role flexibility, teamwork and soft skills, with their actions and attitudes subsequently emulated by the existing workers. These improvements have translated to better morale and productivity for the business:

Every team member pitched in, in all tasks ... they showed flexibility amongst individuals. They were very disciplined, happy to pitch in, they wouldn't just stand around watching someone do something, they were always helping each other, even though they hadn't done the work before. It showed our workers that they didn't just have to stick to one thing.

(CEO of small PPE manufacturing business)

4 Workers outside the usual workforce who are available to meet critical workforce needs arising due to a pandemic. They may include qualified personnel who have retired or final year students. Surge requests are made when an agency requires additional employees because their critical workforce needs cannot be met through current resourcing (Australian Public Service Commission 2020).

5 See also the COVID-19 Manufacturer Response Register, organised by the Advanced Manufacturing Growth Centre (AMGC 2020).

This experience suggested that the position descriptions of the workers could be restructured or reworded to allow flexibility during crisis conditions, also flagging that other aspects of industrial regulations and work health and safety (WHS) need to be considered. Note that another respondent (a smaller manufacturer) reported that their staff were already trained in multiple jobs and that this practice is common in small business.

The other PPE manufacturer was a fashion clothing manufacturer who pivoted to producing gowns and masks (see case study box 1). This business invested in the testing of new materials to meet required standards and produced masks with attractive patterns. This business plans to continue with both clothing and PPE to justify and benefit from the substantial time and investment into the research, development and testing of PPE materials.

The interviewed manufacturers of personal protective equipment expected demand to decline but continue at a rate higher than pre-pandemic. None of these adaptations or innovations required new skills requiring VET.

Manufacturing – other

The representative of a peak body for manufacturing reported that manufacturers of essential items such as food were relatively unaffected by the pandemic. However, manufacturers of products unrelated to meeting the demands generated by the pandemic reported they had lost sales in the region of 40%. By mid-October 2020, one small manufacturer had dropped from two shifts per day to one due to supply chain difficulties.

Of the two large manufacturers interviewed, one had successfully innovated in new methods for testing gaming machines and reported an increased willingness from management to try new ideas. The other (producing polyethene goods and moulding) had not innovated at all, due to tighter margins and conservative attitudes in the industry.

The respondents from a wine-production peak body noted that the wine industry (part of both the manufacturing and tourism sectors) has traditionally been innovative in product development. They felt the industry had not been greatly affected by changing domestic demand and border closures during the pandemic, being deemed an essential item. It was claimed that overseas markets (apart from China) had maintained strong demand for affordable and well-known brands of Australian wine. The respondents pointed to drought, bushfires, trade with China and BREXIT as more pressing issues for the wine industry.

Healthcare

Safety and infection control were the obvious key drivers of adaptation and innovation in healthcare during the pandemic.

Case Study Box 1 – Fella Hamilton

Fashion clothing manufacturer and retailer Fella Hamilton experienced difficulties in obtaining fabrics from China and also falling demand. Pivoting to the production of gowns and masks for the healthcare sector was the obvious solution. The company innovated in reusable gowns and masks. They also inserted clear plastic windows in the masks to enable deaf people to lip-read and see facial expressions. They engaged Indigenous artists to provide designs for the fabric of the masks, with a percentage of profits donated to Indigenous communities. The company invested in extensive testing of the safety of reusable fabrics for gowns. After learning that Fella Hamilton had pivoted to sustainable PPE, a non-profit-organisation approached the company about making reusable menstrual products. The manufacturer has not yet been able to investigate the necessary materials and methods due to the PPE-related workload but will consider it for future production.

Workers' concerns for the safety of the high-risk people in their care and their own safety (and risk of transmission to families) resulted in unprecedented methods for reducing contact with the outside world. Respondents referred to the use of 'Hotels for Heroes'⁶ (supported by the Victorian and South Australian governments) and workers taking up residency in the facilities. Telehealth⁷ was also used wherever possible, including in aged care.

Facilitating and maintaining social engagement with family, friends and the wider community was also important in aged care. Where possible, online video platforms replaced face-to-face interaction in aged care facilities during visits from family and friends.

Some types of businesses, such as dentistry and those delivering first aid training, were severely disrupted by COVID-19, experiencing significant periods of time where normal activities were suspended. Some of these took advantage of the extra available time to update websites and train staff (internally) on the use of new online systems.

The pandemic conditions engendered agility in the development of new medical devices in Australia and internationally (see Alessi 2020 or Cranenburgh 2020). A respondent from a peak body for health research commented on the rate of fast-tracking new medical devices, many associated with the detection, prevention and treatment of COVID-19 (including some types of PPE), for listing on the Australian Register of Therapeutic Goods in 2020. Approximately 7000 new devices were added in 2020, compared with 4764 in 2017, 6178 in 2018 and 4362 in 2019⁸ (Australian Department of Health 2020b). The longer-term impact of COVID-19 on the development and production of new medical devices, and the associated skills needs, is currently unknown.

Hospitality and tourism

Respondents in the hospitality and tourism sectors described changes as 'lessons for the future' rather than innovations. The respondent from a tourism peak body reported that a key change was the adoption of direct booking arrangements⁹ for international travel, to facilitate contact tracing capabilities. Previously these bookings had been made by international travel agents. The direct booking system also has the advantage of helping businesses with planning and resourcing.

Another key example of a lesson for future practice is the structure of travel and accommodation contracts between customers and suppliers (where parties are located overseas), and the effect on commissions to travel agents. A respondent from a peak body for travel described the difficulties in retrieving funds from overseas entities for customer refunds. He suspected that future business operations will involve reframing commissions as professional service fees, restructuring the supply chain with more robust and clearer terms and conditions, and ensuring more systematic engagement with the federal government to clarify how the industry works. None of these operations was seen as requiring VET.

6 See media releases from Victorian Premier Daniel Andrews (<www.premier.vic.gov.au/hotels-heroes-expanded-more-frontline-workers>) and South Australian Premier Steven Marshall (<www.premier.sa.gov.au/news/media-releases/news/health-heroes-hotel>).

7 Health services provided via phone or video conferencing that help to protect healthcare professionals, their staff and patients from unnecessary risk of infection (<www.health.gov.au>).

8 The number of devices listed per year on the Therapeutic Goods Administration (TGA) website may vary at any one time because some devices are cancelled soon, or some years, after listing (TGA pers. comm., 2021).

9 These systems provide online help and training resources, if needed, in the form of categorised instructions and how-to videos.

It was noted by several respondents that major changes and innovations in tourist accommodation had been in train before the pandemic, with some of these due to the negative impact of Airbnb in recent years. Changes mentioned included smaller rooms with luxury essentials and the removal of less important furniture items and entertainment services (due to widespread use of personal devices). The respondents did not see these changes or innovations as requiring new vocational skills for workers.

Often lengthy lockdowns and the suspension of in-restaurant dining meant that many eateries moved to takeaway options. Case study box 2 provides a description of adaptations introduced by a catering business when its usual activities were disrupted. While the changes might be considered innovative, they are not expected to continue when normal business resumes.

Respondents pointed out that the hospitality and tourism sector is unable to pivot easily to different products or markets. A respondent from a hospitality peak body described the industry as:

A traditional industry – jobs will be the same in the future; they’ve been the same for hundreds of years. We have gaps in the supply of cooks and chefs, but that existed before COVID and will exist after.

Case Study Box 1 – Sorrento Catering

Located in regional Victoria, Sorrento Catering normally catered for large functions such as weddings. It pivoted to takeaway food, as did many other restaurants, cafes and hotels throughout Australia. Takeaway fine dining was not very profitable, so Sorrento Catering developed home delivery dinner packs for households in isolation and lockdown, as well as cooking classes and zoom dinner parties. The cooking classes were particularly popular because they were live, interactive and all ingredients were delivered. To make the home deliveries more productive, the business used Australia Post’s targeted postcode mailout service for advertising to nearby households. This strategy maximised the number of deliveries per street and substantially increased Facebook followers. Sorrento Catering also identified diet dinner packs as another niche, given the tendency for people to gain weight during lockdown. However, the business does not expect these new ways of supplying restaurant dining to persist after the pandemic.

Online business and working from home

Respondents across the case study industries viewed the move to online business and working from home as one of the biggest changes in practice prompted by the pandemic. Many reported updating their websites and creating a greater online presence.

Several respondents reported that working from home pushed salespeople towards online ordering and customer relationship management (CRM) technology, which they had previously resisted.

In another case, the development of software allowing testing of electronic machines from workers’ homes had been in progress, but the pandemic changed the deadline: ‘We still would have headed down the same path but just not at such an accelerated pace’.

A respondent from a large manufacturer involved in extensive information technology reported that the practice of working from home had generated greater trust between leaders and employees, with productivity maintained outside the traditional 8 am to 4 pm routine.

Some respondents intended to continue online teleconferences and meetings. Others found that online communication was impractical for some tasks, such as browsing technical operations with customers and training for paramedics and cooks and chefs:

Everything online makes things more clunky. It’s easier to bounce ideas around in the workplace, especially in product development. (CEO of medium-sized manufacturing business)

Barriers to innovation

The interviews revealed that the pandemic affected or highlighted a range of factors that influenced businesses' capacity to operate and, therefore, innovate. Solvency and viability are generally precursors for business innovation (Atkins & Kang 2017; Cowling, Brown & Rocha 2020). These indirect effects of the pandemic on businesses in the case study industries are presented in appendix C.

Innovation was not a priority for some businesses for one or more of the following reasons:

- lack of financial resources
- limited innovation options
- sector-wide conservatism
- survival of the business considered a higher priority.

Some businesses, such as dentistry¹⁰, were unable to innovate to accommodate COVID-19 restrictions, as reported by a respondent from a dentistry peak body. COVID shut dental practices down completely: Victoria had two to three months with zero practice; practices in other states were closed for four to six weeks.

Once adaptations or innovations were considered, they tended to be implemented. One exception was a clothing manufacturer that pivoted to PPE (see case study box 1). The company was approached to manufacture disposable PPE but declined because manufacturing disposable items was not consistent with the company value of sustainability. Another example was a cleaning and disinfectant products manufacturer who did not take full advantage of the increased demand by employing more staff. They wanted to keep and protect the people already employed rather than risk bringing more staff on-site who might transmit the virus. These examples demonstrate that the decision of whether to innovate, and how, is complex.

In some cases, depleted capital reserves meant that planned changes were delayed until the business could recover. Delays (and abandoned plans) occurred most frequently in hospitality and tourism. Businesses in other industries had other considerations. For example, a medium-sized manufacturer of cleaning and disinfectant products in Victoria had a major capital plan involving construction originally scheduled for July 2020. This work had to be postponed to January or February 2021, depending on when restrictions were lifted.

The lack of skills or difficulties in accessing training was not highlighted as a barrier to innovation.

Future innovation

Businesses that could innovate reported gaining more confidence about future innovation. Respondents made the following positive comments about how they will handle business post-pandemic:

[the experience] gave us insights into ideation and the product development process.

(Large manufacturer of non-PPE product)

We stopped panicking about cancelling [face-face] courses ... online communication is not as

frightening now ... people are more receptive and accepting. (RTO in healthcare)

¹⁰ Dentistry frequently uses aerosol-generating procedures, which have a high risk of spreading the virus, even with PPE.

Outside influences can be frightening to business owners. We have more confidence now that we can think more laterally than we first thought. (RTO in healthcare)

Trying to cement changes as standard practice. The changes have made things easier. No reason to go back. (Peak body in healthcare industry)

On the other hand, some industry sectors faced barriers to innovation as an indirect result of the pandemic. The respondent from a peak body for the health industry explained that many pharmaceutical companies have traditionally worked in partnership with universities, which have lost revenue from international student enrolments. Consequently, the number of university-based researchers has plummeted. The comments below reflect the barriers resulting from a lack of time to plan, reliance on technology, lack of capital reserves, uncertainty about future supply and demand, and the wellbeing of workers:

We're going with the flow. Things happen so quickly. It's been adaptation without planning and following government directions. (Peak body representative of healthcare industry)

The industry is likely to go back to previous ways of doing things if unable to take advantage of new methods. (Peak body representative of healthcare industry)

We're struggling to do the job. Technology doesn't work as well as it should. (Peak body representative of healthcare industry)

[COVID-19] has financially ruined many businesses across the industry. The industry is very tired. There's widespread fatigue for workers across the spectrum. (Representative for peak body and RTO in aged care)



The role of VET in meeting skills needs arising from innovation

The innovations or adaptations in the case study businesses that required workers to perform new or different tasks or to update their skills are presented in table 1.¹¹

The case-study interviews showed that, in general, the adaptations and innovations implemented by those businesses where new tasks were performed did not require training through the formal VET sector. Workers could often transfer existing skills without much difficulty. Where training was required, it tended to be conducted through informal on-the-job training or it made use of free online training (from government, industry associations or vendor websites) rather than through accredited VET (even where it was available). New workers were included in this approach, such as those taken on from different industries to join PPE manufacture. They were successfully trained on the job by existing supervisors, co-workers and, in some cases, retirees who came back to work to assist.

Aged care workers were a key exception, where some accredited training occurred in COVID-19-related areas and for upskilling in infection control and dementia care. This training tended to be provided online by private RTOs and was either self-funded or paid by employers. The VET sector responded to the needs of frontline and priority industries (namely, health and hospitality, but also retail, and transport and logistics) by developing an infection control skill set in May 2020. Based on existing nationally accredited infection control training for clinical workers, the skill set was approved by the Australian Industry Skills Commission (AISC) Emergency Response Committee. A new cross-sectoral infection control skill set for all industries became available in July 2020. This skill set is part of the national training system so will be subjected to the normal processes for maintaining relevance and currency. Both skill sets were developed and delivered very quickly, with only one month elapsing between development of the all-industries skill set and its delivery (Wibrow et al. forthcoming).

The use of social media on personal digital devices in aged care facilities was said to be problematic at times. The aged care respondents reported that residents often had difficulty with the technology, while many aged care staff, who lacked digital skills themselves, could not assist them. Where specialist IT support is not available, aged care staff might benefit from training in the use of social media and personal digital devices. Such training is already available in the VET system and could be modified to suit the aged care context, although interviewees were unsure about the potential role of VET in solving the issue.

¹¹ Innovations not requiring the development of new skills are presented in table B1, appendix B.

Table 1 Innovations or adaptations requiring new or updated skills in the case study businesses

Innovation/adaptation by case study industry	Type of training provided	VET availability	Does business see role for new VET?
Manufacturing			
Pivoting to new products (usually personal protective equipment) or methods	Internal (on the job, demonstrations/training by supervisors and co-workers)	Depends on product	Mixed views — depends on product
Modifications of products	Internal (on the job, demonstrations/training by supervisors and co-workers)	Not relevant	No
New machinery and equipment (incl. computers)	Demonstrations/training by vendors	Not relevant	No
Employing extra workers from other industries who had lost their jobs (and Australian Defence Force personnel)	Internal (on the job by supervisors and co-workers, role modelling by ADF)	Not relevant	No
Maintaining contact with customer base by blogging about items of interest, not merely those related to the product	Internal, training by colleagues, online resources	Yes ¹ but not needed/used by respondent	No
Production of new pharmaceuticals	Internal	Yes ² but use unknown	Yes
Home delivery of online orders	None	Yes ³ but not needed/used by respondent	No
Healthcare			
Use of surge ⁴ workforces in aged care	Internal (on the job), unaccredited structured training, accredited training	Yes ³	Yes, but needs to be shorter duration and cheaper
Switch to online communication between family members in aged care facilities and hospitals	None	Yes ⁵	Unsure
PPE marshals in hospitals and health services (but not in aged care)	Online, unaccredited by state government	No	No
Use of telehealth	Internal, online by software platform provider	Yes ⁶	No
'Teletrials' — clinical trials via telehealth methods where products are sent to patients instead of patients attending hospitals; data collected remotely or reported online	Online, unaccredited by peak body	No	Respondents unsure
Hospitality and tourism			
Automated processes ⁷ adopted to minimise expenditure (e.g. payroll and booking systems)	Internal training/online training provided by software vendor	Yes ⁸	Yes, but needs to be updated
Digital presence and websites (often limited in small family-run micro-businesses)	Internal training/online training provided by software vendor, online resources.	Yes ¹	Respondents unsure
Online ordering adopted by hotels, wineries and liquor outlets, and cafés and restaurants (see case study, ⁹ box 2)	None needed by one respondent, online resources for others	Yes ¹⁰	No

Innovation/adaptation by case study industry	Type of training provided	VET availability	Does business see role for new VET?
Takeaway and home delivery adopted by hotels, wineries and liquor outlets, and cafés and restaurants	None	Yes ³	No
Zoom dinner parties (restaurant/fine dining meals delivered to customers in lockdown in Victoria)	None	No	No

1. Examples include SIRXOSM004 'Analyse performance of social media and online business tools', SIRSS00021 'Develop an online presence for customer engagement', SIRSS00020 'Manage and implement social media and online customer engagement' and 'ICTWEB304 'Build simple web pages' units of competency.
2. For example, FDF30210 - Certificate III in Pharmaceutical Manufacturing.
3. Examples include CPPSS00050 'Clean hospitals and aged care facilities', CHCSS00078 'High support and complex care – aged care', CHCAE005 'Provide support to people living with dementia' units of competency.
4. Workers outside the usual workforce who are available to meet critical workforce needs arising due to a pandemic. They may include qualified personnel who have retired or final year students. Surge requests are made when an agency requires additional employees because their critical workforce needs cannot be met through current resourcing (Australian Public Service Commission 2020).
5. For example, SIRXOSM003 'Use social media and online tools' unit of competency; would need to modify to context of supporting aged care residents.
6. For example, HLTADM001 'Administer and coordinate telehealth services', and HLTADM002 'Manage telehealth technology' units of competency.
7. Acknowledged as likely to have resulted in substantial long-term job loss in the industry.
8. For example, SITTTSL010 'Use a computerised reservations or operations system' unit of competency.
9. The case study businesses gave permission to be identified; refer to appendix A for more detail.
10. For example, SIRXECM003 'Design and ecommerce site' unit of competency.

Source: interviews with industry representatives.

The shift to online delivery of training

The move to online delivery of training was reported to be time- and cost-effective for consumers. For example, an RTO converted part of a first aid course for dental and general practices to online delivery. Consequently, practices were shut down while training for three hours only rather than the previous five.

Other businesses used online training through the pandemic. As mentioned above, respondents for aged care reported high levels of uptake of available (online) training modules during the pandemic. Still other businesses took the opportunity to use online training in new software systems (for example, for web design, new contactless booking systems or new student enrolment systems). This tended to be provided by the software vendors, with interviewees believing that the VET sector is unlikely to have the capacity to provide training for the wide range of specific systems available.

Respondents saw online delivery of training, whether through the formal VET sector or not, as 'here to stay'. Despite this view, some forms of training are more effectively delivered face to face. While the RTOs interviewed had adapted their training to online delivery during the pandemic, they emphasised that many aspects of training in hospitality and healthcare could only be effectively undertaken face to face, with hands-on use of tools and equipment. One demonstrated the difficulty of viewing and handling a small piece of equipment during the online interview.

Respondents with a more multicultural workforce noted some difficulties with workers' language and digital literacy, which affected their ability to complete online training in cleaning and hygiene practices. Language and literacy training itself is less feasible during a pandemic for logistical reasons, such as the need for face-to-face and group teaching methods (O'Dwyer & Mihelic 2021). The difficulties experienced by some workers highlight the need for language and literacy to be addressed per se.

Before the pandemic

Many respondents stated that VET still needed to meet existing pre-pandemic training needs in their industries.

The interviewees reported that they usually addressed skills gaps and skills development with a range of training products, with a clear preference for courses of short duration and a focus on skill sets, regardless of type or location of delivery and provider.

Apart from the three interviewees who represented RTOs, respondents were not overly concerned with accreditation, unless a qualification was needed for a particular job, such as toolmaking. Some organisations in the aged care sector had developed their own non-accredited leadership courses based on the content of accredited VET courses, their aim being to make the training cheaper and more flexible.

After the pandemic

Respondents had mixed views of whether the VET sector had the capacity to meet current training needs, whether these were related to the pandemic or not. One respondent from a peak body for manufacturing reported no demands for a rapid response in training that would make a difference to skills needs. Likewise, the individual manufacturing businesses interviewed did not consider that their workers needed specific qualifications in the short-term, even if the business had changed the way it operated. For some interviewees, it was too early to tell. The respondent from a pharmaceuticals peak body believed that the long-term effects of the pandemic on productivity and the future demand for workers with relevant VET training (such as the Certificate III in Pharmaceutical Manufacturing) are still unknown.

Cleaning will continue to be important for infection control, especially for the healthcare and hospitality and tourism industries, but there was no strong support for the provision of VET training, either accredited or non-accredited. A peak body representative for the accommodation sector (in the hospitality and tourism industry) claimed that no VET providers have 'done this well', so the sector tended to use non-accredited training programs provided by other agencies. A respondent representing manufacturing did not consider that accredited or non-accredited VET had a role in meeting cleaning training needs or training for COVID-19 marshals, as there was already sufficient free online training available from government websites, and it is generally 'common sense'.

Some respondents spoke about the future role of VET in their industries, over and above the response to the pandemic. A respondent from a health industry peak body who is familiar with both higher education and VET was able to specify the level and content of VET training needed in his sector. He suggested that a certificate IV in clinical trials skills and a certificate IV in leadership and management of clinical trials need to be developed. These certificates should cover the necessary soft skills and the reporting and understanding of how clinical trials work. He has found that some fields in higher education neglect certain soft skills, which are given more attention in VET. He also suggested WHS as another possible area for more accredited VET training. More WHS consultants could be needed over the long-term, as greater attention to hygiene and safety in workplaces will continue.

For some, the pandemic highlighted how future workers (that is, the 'next generation of workers') may need external training from a VET provider, because they are unlikely to have 'grown up' with the machinery and skills of current older workers. One example given was sewing skills for PPE manufacture (and clothing manufacture in general).

Others felt that VET has an important role in providing accredited training post-pandemic because some sectors (such as the travel industry, a component of the hospitality and tourism industry) need an injection of external knowledge and ideas:

Travel is inbred in terms of education, it has no new ideas, but the old ways are not working now and won't in the future.
(Representative of peak body for travel industry)

This comment refers to changes in consumer preferences. The respondent explained that previously the industry had prided itself on direct customer contact and personalised travel advice. Now most people book their own travel online and the available training does not yet reflect these changes. Another interviewee, also from the travel sector, noted that VET training content for the travel industry has not been updated for 12 years. He suggested that the industry identify and develop the material they require existing VET trainers to deliver.

Views on the role for formal VET were not consistent across all sectors of the hospitality and tourism industry. Giving feedback, a peak body representative of the accommodation sector indicated that many employers prefer on-the-job training. The industry was described as:

one of the few industries where you can start at the bottom and get to the top without qualifications because it's important to know every aspect of the business.
(Representative of peak body for accommodation)

A demand for training in leadership, management, and online sales and marketing during crises (including floods, droughts and bushfires) rather than in technical skills was identified by many respondents from all three case study industries. These findings are consistent with the areas of skills shortages identified by the Australian Bureau of Statistics (ABS; 2020b) before the pandemic. Such training could be incorporated into existing courses.

Some respondents generally felt that future training in the VET sector would consist of short intensive courses, or micro-credentials, which enable businesses to be responsive to rapid change. They were not concerned about whether this kind of training should be accredited or not. The RTO respondents suggested that short courses should be designed to stand alone, provide stackable skillsets, or be used to build a full qualification if needed.

A representative of the manufacturing industry, however, was not convinced that short intensive training was the answer to skills shortages, whether COVID-related or not. He felt that many emergency claims for training are just a cry for funds. He also contended that any training offered now as 'rapid response' had been available before the pandemic. He believed there is now too much focus on rapid response training and micro-credentials for addressing enduring skills shortages.

Some uncertainty was expressed about the VET sector's ability to provide training in the future due to changes in the sector itself. One manufacturing respondent was unsure whether the VET sector can still deliver training in the skills needed for his specific field, because that training is no longer available at the local TAFE (technical and further education) institute. He believed that, if accredited VET training became available locally, more of his staff will benefit from it, as only about 20–25% have a relevant qualification. He also suggested that training in this field should have been maintained, by combining it with allied fields.

In a similar vein, a respondent from a peak body and RTO for aged care questioned whether some parts of the VET sector itself would survive the pandemic as they considered that some aspects of training

might become financially unviable. RTOs in the aged care sector were unable to find work placements¹² for new entrants; nor could they send trainers to workplaces during the pandemic.

Some respondents were unsure who should provide training. Several were unfamiliar with the VET system and unaware of the sector's scope and capabilities. One respondent who was familiar with VET explained that many industry leaders lack awareness of the VET sector because their own qualifications are in higher education. Indeed, in some businesses higher education is more relevant. One manufacturer (in advanced manufacturing) viewed the VET sector as unlikely to meet the company's niche business needs, which require staff with higher education qualifications. This company uses internal training and online training provided by professional networks such as LinkedIn.

12 The Australian Government Department of Education, Skills and Employment (DESE) investigated issues in the provision of mandatory work placements for VET students during the pandemic. The Australian Industry and Skills Committee (AISC) is working closely with industry and other stakeholders to support mandatory workplace placements: <<https://www.aisc.net.au/hub/aisc-review-covid-19-related-issues-mandatory-workplace-requirements-training-packages>>.



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Appendix

Appendix A: Method

Selection of case study industries and businesses

The manufacturing, hospitality and tourism, and healthcare (including aged care and pharmaceuticals) industries were selected by NCVER and the Project Advisory Committee as case studies. According to media reports, scans of the recent literature and ABS statistics for August and September 2020, these industries are among those most affected by the pandemic.

Approximately 100 businesses and peak bodies were identified from peak body membership lists, google searches and referrals from peak body representatives. They were contacted via email to explain the research and to seek their assistance, with an assurance of confidentiality and with the NCVER privacy policy attached. Telephone follow-ups were made between three and ten days later. Twenty-one managers from individual businesses or representatives of peak bodies agreed to participate. They were interviewed for between 30 and 60 minutes between mid-October and late November 2020.

Table A1 Summary of respondents by industry

Industry	Number of businesses	Number of peak bodies ¹
Manufacturing	6	1
Healthcare	2	5 ²
Hospitality and tourism	-	7
Total	8	13

1. Three of the peak bodies were also RTOs (two in healthcare and one in hospitality).
2. One interviewee had to leave the interview halfway through.

Characteristics of case study industries

Manufacturing

In August 2019, 6.7% of Australian workers were employed in manufacturing, down from 7.9% in 2014 (ABS 2019a). Most manufacturers whose workforce is based in Australia are SMEs; the workers of larger manufacturers, such as Ansell (producer of PPE), tend to be located offshore. At the end of the financial year 2018–19, Australian SMEs made up 99.5% of all Australian manufacturing businesses (ABS 2020b). In 2018–19, only 30% of SMEs in manufacturing were engaged in goods and services innovation compared with 42% of large manufacturers (ABS 2020b).

Even before COVID-19, manufacturing had the third largest shortage of skills for core business activities in trades (14.5% of all surveyed manufacturing businesses, after construction [23.5%] and other services¹³ [19.2%]). The next largest skill shortages in manufacturing were in marketing (5.5%) and financial skills (5.1%) (ABS 2020d).

¹³ 'Other services' is defined in ANZSIC as religious, civic, professional and other interest group services; selected repair and maintenance activities; and private households employing staff (ABS 2013).

Healthcare

For obvious reasons, the healthcare sector has been disproportionately affected by COVID-19. Including social assistance in the definition of healthcare, workers in this sector represented 13.5% of Australian workers in August 2019, up from 12.2% in 2014 (ABS 2019a). This group has a wide range of skill levels and qualifications.

Innovations in healthcare and social assistance were most likely amongst businesses employing 5–19 persons (25.7%) and 200 or more persons (also 25.7%). Innovations in processes were implemented by about half of small, medium and large business, but only by 19.8% of businesses employing 0–4 persons (ABS 2020c).

Hospitality and tourism

Hospitality and tourism are among the industries most heavily affected by COVID-19. This is a labour-intensive sector, representing 5.2% of employment (~666 000 employed persons) and 3.1% of GDP in Australia in 2018–19 (ABS 2019b)¹⁴. The sector provides jobs for both low-skilled and higher-skilled workers and employs many seasonal, part-time and temporary workers (OECD 2020).

Provisional estimates of overseas arrivals from non-Australian citizens show a decline of more than 99% between July 2019 and July 2020 (ABS 2020e). By June 2020, the number of main jobs in tourism had declined by 17.8% from December 2019 (ABS 2020f).

Case study businesses

One of the case study businesses was suggested as a good example of pivoting by an interviewee from an industry peak body. This business was contacted for further information and the CEO gave permission to be identified. The other was an industry interviewees who gave permission to be identified during the course of the interview.

Interview schedule

Interview Schedule

Innovations in response to COVID-19 and the impact on skills

Preamble: Thank you for assisting us with this research. It will be used to inform training providers, state training authorities, the Commonwealth Government and workers about the impacts of COVID-19 on normal business operation and the adequacy of VET to support any changes you have made. We are especially interested in whether you have made any innovations to the way you do things and whether your staff had the necessary skills to cope with these innovations or faced barriers due to cost or lack of VET courses or modules.

By innovation, we mean ‘changes or improvements to products, processes, services, distribution, delivery, sales and marketing’.

Before we begin, do you consent to this interview being recorded for reference purposes? (If NO – just take notes).

¹⁴ Data for tourism in the national accounts includes hospitality (ABS 2014). This report defines hospitality to include accommodation, cafes, restaurants and takeaway food services, and clubs, pubs, taverns and bars (ABS 2004).

Preliminary demographic details:

- How long has this business been operating?
- Location (state, city)
- How many employees do you have?
- % FT/PT/casual?
- Who/what is your main market?
- How many sites?

1. How has the COVID-19 pandemic affected your business?

2. What changes have you made to the way you operate? *(some may be positive e.g. hired more staff to keep up with demand, innovative changes in production, delivery or marketing; some negative e.g. retrenched staff)*

2.1. If no changes

2.1.1. Would you have liked to have made innovations?

If so, why weren't you able to do so? Were staff skills an impediment? Were costs or availability of VET a barrier for your organisation?

2.1.2. Do you know whether other businesses in this industry have been innovative in their response to the pandemic?

2.1.3. How do you know that?

2.1.4. What do you think enabled them to be innovative?

2.1.5. Do you plan to make any innovations when possible? *(probe if necessary – when do you plan to do this; what do you need to make the planned innovations happen; will you need to upskill or reskill existing staff and/or recruit new staff?)*

End of interview

2.2. If they did make changes:

2.2.1. What areas of the business did you innovate in? What were the specific innovations?

- a. Management
- b. Professional
- c. Technical and para-professional
- d. Trade
- e. Clerical/office
- f. Sales and personal service
- g. Transport, plant and machinery operation
- h. Labouring and related
- i. Induction
- j. Personal development and leadership
- k. Computing skills
- l. Data literacy and data science
- m. Health and safety
- n. Diversity and inclusion
- o. Other specify

2.3.

2.3.1. Would you have made these changes if it wasn't for the pandemic? *(probe why/why not, if appropriate).*

2.3.2. Would you have made any other changes under normal circumstances?

- 2.3.3. Will the innovations you have introduced continue once the pandemic is over?
 - 2.3.4. Has the innovation had a positive or negative impact on your business (e.g. not necessarily in returns but possibly in staff morale, providing new skills, insight into how to introduce innovations better in the future)
 - 2.3.5. Based on your experience with the pandemic-related innovation/s, will you be more likely to innovate in other new products or services in the future? Why/why not?
 - 2.3.6. What kind of returns on investment in this innovation/s have you received?
 - 2.3.7. Were there any other innovations you could have undertaken? Why this particular one?
3. Did you need to recruit workers with the skills you needed for the new innovations to work?

If so:

- 3.1. Did you have any trouble attracting them?
- 3.2. Did you look for any particular accreditations?
- 3.3. What new skills did they bring?
- 3.4. Did existing staff receive any training in relation to the new innovations or did they continue in their usual roles?

If not:

- 3.5. How well were your current staff able to adapt to these changes (e.g. flexible skills/skills transfer, or training)?
 - 3.5.1. Was appropriate VET training available and if so was cost a barrier?
- 3.6. **If flexible/transferable skills**
 - 3.6.1. What are the similarities and differences of the work as a result of the innovation/s?
- 3.7. **If needed training**
 - 3.7.1. Who provided the training?
 - 3.7.2. Cost, length of training (e.g. hours, days, weeks)?
 - 3.7.3. Was it accredited or unaccredited?
 - 3.7.4. How was it delivered (in person, online)
 - 3.7.5. Were you/your staff satisfied with the training?
 - 3.7.6. Was it easy to obtain and organise, given the pandemic conditions?
- 4. What type of qualifications did your workers have pre-pandemic? (field and level)
- 5. Will your current or future staff need new qualifications to cope with the new way of doing things in the long-term, or will short intensive training courses be enough?
- 6. Have there been any other issues related to your innovation/s and the skills of your workforce?
 - 6.1. Do you think the VET sector has the ability to deliver those skills?

Thank you for your contribution to this research. We will send you a summary of the key findings when they become available.

Appendix B: Changes not requiring new skills

Table B1 Innovations or adaptations not requiring new skills in the case study industries (no internal or accredited training required)

Manufacturing	Healthcare	Hospitality and tourism
Systems enhanced to increase capacity	One worker one site policy for aged care facilities (and increased hours for those workers; supported by the Vic. and SA governments)	Changed bench seats in 4WDs used in adventure tours to bucket seats to meet social distancing requirements
Planned capital expenditure brought forward	Change to staff management so that the same staff attended the same aged care residents	Room management, layout and furniture
Prohibited outside visitors from entering site; gates kept shut	Use of a shipping container with a glass partition for family visiting relatives in aged care	In advertising, pivot to focus on safety rather than location and luxury
Outside contractors supplying delivery or transport drivers asked to provide the same individuals for all work	Keeping larger stocks of PPE on hand	Tap into other networks such as Grey Nomads to meet shortage of international backpacker labour
Daily rather than weekly 'toolbox' meetings	Staff in health and aged care slept on the premises or in dedicated hotels to minimise the risk of contagion to and from their families	Use COVID safe approval from Australian Tourism Export Council for marketing of wine
New marketing method (billboards – not used before by this business)	Sent equipment such as mannequins interstate for use during online practical training in first aid	Eat Out to Help Out (vouchers from government to support restaurants and cafes)
Use of pop-up shops	Community paramedics make home visits to people too afraid to go to their GP	Restaurants pivoted to be more like grocery stores e.g. pick up newspapers, milk with meal deliveries
Maintaining contact with customer base by blogging about items of interest, not just related to the product	Only one paramedic per car. They use their own cars and are paid an allowance	Pivot from 'dining in' to 'dining out' model
More time spent on the telephone with customers in lieu of personal service Outside expertise in infection control (nurses) brought in as part of permanent staff	Relatives no longer allowed to travel in ambulances as a rule	'No-touch' systems for hotels (e.g. virtual payment, keyless automatic door entry)
Rescheduled rosters over 6 days per week instead of 5, to meet production targets with fewer staff on the floor due to social distancing rules.	Buddy system as training method for paramedics where online training not practicable	Use of credit cards at pre-booking to avoid no shows ³ (charged if don't turn up).
Shifted some assembly to Asia where the required facility was still able to operate	Robots for food delivery and some cleaning operations	Restaurants pivoted to selling gourmet meals in jars
Marketing/promoting products (both PPE and other products) as Australian-made (seen as more reliable and of better quality; customers more supportive of Australian business during pandemic)		Pivoting /flipping to regional and domestic travel
New formulae for cleaning products		
More sophisticated monitoring of production from external locations using cameras		
Development of technological solutions for testing new products (e.g. rig ¹ for testing new content on slot machines)		
Daily rather than weekly 'toolbox' meetings ²		
New design involving Indigenous artists		
Tendering for PPE contracts		

1 A rig is a replica of a slot machine.

2 An informal health and safety meeting of about 10–15 minutes that focuses on topics related to the workplace or job, such as hazards, safe work practices and how the organisation is minimising risks (Australian Industry Group 2020).

3 A hospitality respondent explained that 'no-shows' are more of a problem when only limited numbers are allowed in venues.

Appendix C: Indirect effects of the pandemic on innovation

Apart from the direct effects of the pandemic, business innovation has also been indirectly affected by government actions, workers' attitudes and behaviours, and productivity and profitability.

The role of wider government support, actions and policy

The interviews identified that businesses have mixed views of government action during the pandemic. Some were frustrated and even angry (particularly hospitality and tourism). In contrast, others expressed appreciation of government support (for example, manufacturing and some hospitality businesses). Some sectors, such as dentistry, had advised government of necessary restrictions. Others (particularly aged care) were frustrated with what they see as the culmination of a lack of long-term government support and recognition.

Manufacturing

Workplace health and safety regulations were said to change frequently. Management could benefit from some assistance in this area, such as proactive notifications from government. Small companies were described as 'winging it' because they were often unaware of recent changes and their details.

Interviewed small-to-medium enterprises saw government protection and assistance as necessary because Australian markets are small and fickle. Uncertainty over the future of the manufacturing sector existed before the pandemic, but, if government support increases post-pandemic, SMEs will be more confident of planning more effectively.

Health

Aged care experienced severe staffing problems, mainly in Victoria. Respondents from aged care attributed this problem fundamentally to government viewing aged care as separate from healthcare. Apart from more long-term systemic differentials, a respondent pointed to how hospitals were required to have PPE marshals during the pandemic, while aged care facilities were not. She also referred to 20 reviews of aged care over the last 20 years and a high level of agreement between providers and consumers on problems and solutions, which she sees as having been dismissed.

The peak body for paramedic practitioners reported that paramedics returned to the old model of service provision – assisting people in their homes.¹⁵ This approach would have benefited from additional staff, but no government funding was available.

The respondents from the medicines and pharmaceuticals sector suggested that some innovations in the use of telehealth during the pandemic are likely to be negated by government regulation, post-pandemic; for example, the temporary MBS telehealth items were, at the time of interviews, slated to cease on 31 March 2021.

A respondent from a peak body in the medical technology and pharmaceutical sector noted increased government attention to the sector. This attention is focused on maintaining supply to pharmacies and hospitals. The price of medicines and supply costs have increased. (Freight costs had reportedly increased by 1000%.) These costs have been borne mostly by industry, not consumers or government, although the federal government has assisted by subsidising freight costs. The need for skilled migration

¹⁵ The paramedic practitioner representative explained that many people were afraid to visit their GPs. Home visits by paramedics also helped to reduce the spread of COVID-19.

to provide the skills needed for Australian innovation in this sector was raised. Skilled migration was seen as the solution to a lack of international perspective amongst Australian businesses. This view may be less applicable to workers with vocational training.

Hospitality and tourism

Many areas in the travel sector previously requiring improvement were further exposed by the pandemic, such as how cancelled bookings affected commissions, the weak scope of terms and conditions, and how the industry engaged with government. Previously, little direct engagement occurred. Now, systematic processes to deal with the federal government have been developed to communicate how the industry works. This new communication indicated that politicians, their staffers and other bureaucrats are not familiar with key aspects of the industry, such as the use of commissions and claw-back difficulties when dealing with international third parties. One lesson from the pandemic is the need to codify how the industry operates. Government lack of awareness of the pandemic's true impact on travel was said to have resulted in the use of 'blunt instrument' travel bans, particularly domestic border closures.

The shortage of labour due to international travel bans affecting backpackers on working holidays and international students was highlighted by interviewees. These groups are the main source of labour in the hospitality and tourism industry. Respondents also expressed frustration at the apparent lack of government understanding of how the tourism business operates. One referred to a 'can't do' rather than 'can do' approach. Another said 'bureaucrats were making it up as they went along' and using excessive red tape, especially in the first wave. The pervading view was a disconnect between government departments and industry (not just hospitality and tourism), especially small businesses.

Workers' attitudes and behaviours toward new skills and transferring skills

Although individual businesses in the three case study industries have experienced very different impacts, workers in most businesses interviewed appear to have adapted to new tasks and processes quickly and easily. Businesses with staff who could work remotely reported no issues. A business that recruited extra staff from other industries described them as high-quality workers who were looking for stability and who readily absorbed training in new tasks.

Manufacturing

A business with increased production located in regional areas with limited labour pools took on workers released from other industries (for example, cafes and dry cleaners). The new workers had to be trained (internally and on the job), but they all worked very well, with one respondent citing a retention rate exceeding 80%. He described these workers as 'not a transient type of worker', implying qualities such as long-term motivation, flexibility and reliability.

A respondent business producing cleaning products in a capital city reported that working with the new innovations had a positive impact on workers because they felt they were contributing to overcoming the pandemic: 'It made people feel good, that's more important than returns to shareholders'.

This respondent also found that the rate of sick leave dropped. He attributed this pattern to workers feeling that being at work is a privilege in these conditions, so it would be 'bad form to take a sickie'.

One respondent spoke broadly about some older staff adapting well to required changes, while others struggled.

Health

New skills and skills transfer were not reported as problematic. Respondents representing aged care reported that aged care workers had to adapt to increased demands on their time and skills and to a range of tasks through necessity, but at the cost of fatigue. Given the findings of the Royal Commission into Aged Care Quality and Safety¹⁶ (Deloitte Access Economics 2020), more workers will have a wider range of skills, post-pandemic.

Hospitality and tourism

No respondents from this industry commented on any particular attitudes or behaviours from workers toward new skills or skills transfer, even though it was one of the hardest hit by the pandemic. This outcome implies that remaining workers were more likely to multitask, or that the more skilled workers remained (or both). A respondent from the restaurant and catering sector suggested that some staff experienced burnout. On the other hand, she also felt that the survival of the industry also showed resilience.

As in the manufacturing SMEs, staff in some hospitality and tourism SMEs were described by one respondent as ‘jacks-of-all-trades’. Using a range of different skills and learning new skills can be routine for many workers. A wide range of skills would contribute to the high level of skills transfer and flexibility identified in the interviews.

Impacts on productivity and profitability

Productivity and profitability were not necessarily correlated during the pandemic, particularly in manufacturing; nor is profit the main aim of some organisations, particularly in healthcare. While severe downturns in profitability can drive innovation, as occurred amongst restaurant and catering businesses, other businesses were less likely or able to take risks.

Innovations in hospitality served to keep some businesses solvent rather than profitable. Some businesses in the hardest-hit industries of hospitality and tourism are likely to be ‘zombie’ businesses¹⁷ (see Stayner 2020). Some businesses in the other case study industries could also be zombie businesses.

Manufacturing

The PPE manufacturer experienced an estimated 20–25% increase in productivity due to new machines and process management. This business went from a small family business with 15–18 full-time staff to 120 employees (although staff numbers will be reduced after the pandemic). At the time of the interview, in October 2020, this business operated around the clock. More production also requires more resources, such as monitoring equipment and increased reporting and administration.

The pandemic has reduced margins for other businesses, despite continuing strong demand, by disrupting supply chains that rely on imports, increasing energy prices, and restricting interstate freight. One respondent’s overseas materials increased in price by a factor of 16.

Demand fell in some sectors in manufacturing: one interviewed business lost 55 of its original 70 customers and halved the number of shifts per day. All staff were kept on with the assistance of

¹⁶ The Royal Commission has called for a minimum of certificate III qualifications for all personal care workers (Deloitte Access Economics 2020).

¹⁷ Unviable businesses artificially kept afloat by external support, in this case by JobKeeper payments for workers (Carey 2020).

JobKeeper, but some have little to do. This respondent also found frequent handwashing and cleaning of equipment, and increased administration and record-keeping very time-consuming and thus unproductive. He estimated productivity decreased between 10 and 20%.

The fashion clothing business interviewee reported that the pivot to PPE had helped cash flow and significantly contributed to the bottom line. The business is now in a much better financial position than it would have been otherwise. However, it is still too early to calculate the returns on investment.

Some businesses prioritised other concerns over profits. The manufacturer of cleaning products focused on producing disinfectants, in effect reducing the production of other products. This business also avoided taking on new staff, even with a tripled demand for industrial cleaning products, to better protect existing staff.

Social distancing reduced productivity for the poker and game-manufacturing company because fewer people could be on site to assemble components. The poker machine side of the business shut down anyway during the pandemic due to lack of orders. The game-development side grew, but not enough to offset the losses from lack of poker machine orders.

The wine-production industry respondents reported that the industry was already using agricultural technologies¹⁸ (ag-tech) before the pandemic to increase agricultural productivity. Profits have since been affected by seasonal labour shortages for picking grapes: they cited an example of a vineyard needing 100 workers but only finding 40.

One respondent summarised the situation as: 'Managing COVID has had a big impact on the way we operate – we have put in all the usual COVID-safe practices, but it has come at considerable additional cost'.

Health

The respondent representing a peak body for medical technology and pharmaceuticals stated the pandemic had prompted fast-tracked proof-of-concept processes and relaxed regulations. These changes will drive innovation.¹⁹

Dentistry was severely affected by the pandemic, but the respondent for this sector of the health industry expected suppressed demand to compensate. He also pointed out that the salaries of oral health therapists with VET qualifications can exceed those of graduate dentists with higher education qualifications, so practices prefer to use graduate dentists as assistants.

It should be noted that both not-for-profit providers and private providers of aged care receive profits. However, not-for-profits have lower profits and profit margins (BDO 2020). As described by the representative of a peak body in aged care, the workforce for both provider types is traditionally based on casual workers, with frequent movement between facilities. The pandemic has changed these arrangements. Single sites have had to increase hours for workers, and some facilities have offered more money to attract and keep their workers, especially in Victoria. These changes would have negatively affected profitability.

¹⁸ Ag-tech includes technologies such as blockchain, artificial intelligence, big data and the Internet of Things (IoT).

¹⁹ The respondent noted that, historically, medicines have been very highly regulated and generally slow to change.

Hospitality and tourism

The wine industry representatives noted that ATEC (Australian Tourism Export Council) program has introduced new health and safety measures, and new policies, administration and governance. They described these as ‘very thorough’, but at this stage they were unsure whether the more stringent requirements had affected cellar door sales.

A representative from the travel sector described its current status as undergoing consolidation, or, as he described it, ‘big fish eating little fish’. He acknowledged that this strategy cannot guarantee survival: clientele of companies in buy-outs may not necessarily come along, or even still exist. He also pointed out that intrastate travel cannot compensate for interstate and international travel, especially in areas such as Far North Queensland and Central Australia, which are heavily reliant on international travel. He referred to statistics showing that up to 90% of tourists to attractions such as the Penguin Parade in Phillip Island, Victoria, are international visitors, mostly from China. He reported industry recovery estimates of up to four years.

The accommodation sector could not pivot or innovate, and had lost half of its workforce.²⁰ The respondent for this sector reported that businesses have relied on reserves and injected capital to remain solvent. He estimated the sector will not recover until 2023–24.

The respondent representing food and catering stated that many restaurants, cafes and other food outlets and providers have already become insolvent and have closed permanently. Many are ‘zombie companies’. For those still operating, social distancing requirements mean that the ratio between staff and customers is not cost-effective.

20 Workers in the accommodation sector were described as having VET qualifications at best and mostly female. This view is broadly consistent with ABS 2016 Census data showing that over half (60.5%) of persons employed in the accommodation industry have education levels of certificate IV or lower VET qualification or Year 12 or lower secondary schooling as their highest level of education. A similar proportion (59.7%) of these workers are female.



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