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PREFACE

At the Singapore National Trades Union Congress (NTUC), we recognise acutely that we are on the precipice of revolutionary change. The transition towards a more digital, flexible, and greener economy accelerated by generative artificial intelligence, the post-pandemic rise of remote and gig work, and the climate crisis represent fundamental shifts in relationships between employers and workers, as well as workers to their work. As these relationships transform, so must the Labour Movement's compact with workers. To this end, NTUC reached out to over 42,000 workers through our year-long #EveryWorkerMatters Conversations public engagement exercise to better understand their needs, anxieties, and aspirations for the future. We have also intensified our efforts in research and innovation to assess and leverage pivotal labour trends that will impact the workforce of today and tomorrow. The Singapore Labour Journal is an extension of these ambitions.

The theme of this edition is "Challenge as Opportunity," which reflects the Labour Movement's unwavering aim to anticipate change and adapt by innovating, as well as our mettle amidst uncertainty and adversity. This edition delves into pressing labour trends such as slowing workforce growth, and the need for flexible work arrangements to re-employ mature workers and caregivers. We have also maintained our distinctive approach of continuously including practitioners and policymakers in addition to scholars from diverse disciplines in these conversations. This edition includes insider perspectives into developments in Singapore's skills and training ecosystem and how flag carrier Singapore Airlines (SIA) Group turned to unions to manage its 30,000-strong staff during the COVID-19 pandemic. It also features NTUC's programme to offer flexible roles for women caregivers seeking to return to work, a first-of-its-kind in the environmental industry, showcasing our resilience and adaptability in the face of challenges.

In a fast-changing and increasingly volatile work landscape, embracing challenges as opportunities will require critical dialogue and inquiry among all stakeholders. In this respect, journal work—the undertaking of cultivating conversations, sharing diverse perspectives, and building upon others' knowledge—is a project of mutuality and community not unlike unionisation. Underlying both is the ethos that we do better when together. NTUC, with its third year and volume of this Journal, proudly remains committed to creating space for important, thoughtful, and provocative work, and to ensuring that every stakeholder's voice is heard and valued in these conversations.

The challenges ahead are inevitable and necessary. Trying to avoid these disruptions and structural changes in our economy will not only doom workers to redundancy but also neglect their potential to create new jobs and better working conditions. What we must do is, therefore, face these challenges head-on, help workers stay ready, relevant, and resilient, and safeguard their interests and rights to shared prosperity.

I am hopeful that this Journal will advance our knowledge of the latest labour issues and best practices and serve as a catalyst for change. I am grateful for the support of our Advisory and Editorial Board members, whose expertise has contributed to the Journal's success. I also sincerely thank the esteemed contributors and reviewers for entrusting their work to us.

Happy reading, and may these pages inspire meaningful discourse and action in our respective fields.

Patrick Tay
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General Editor of Singapore Labour Journal
National Trades Union Congress, Singapore

RESEARCH ARTICLES

Slowing Workforce Growth: Predicting Labour Trends and Investigating Perspectives of Mature Workers and Women With Caregiving Responsibilities

Sheryl Chua, Soon-Hock Kang, Nicholas Sim, Wen Shan (Vivien), Zheng Fang and Sandra May Myo Han

Abstract

The labour force is experiencing an increased proportion of mature workers, alongside a slowdown in the number of young entrants joining the workforce. Many organisations will need to adapt their workforce management strategies to cushion the reduced labour supply in the workforce. This paper explores the implication of this demographic development by utilising a multimethod approach to examine current and future trends in the labour market as well as the key factors that can influence the decisions to remain in the labour market for mature workers and women with caregiving responsibilities. Forecasting methods were applied to explore how various demographic scenarios could impact specific industries. We found that the labour market is generally expected to recover based on the forecasted increase in the job vacancy-to-unemployment ratio and fall in the unemployment rate. At the industry level, however, the manufacturing industry is expected to experience some headwinds in employment growth, which is expected to be weak, while the construction industry is expected to see a decline in employment growth. Finally, job vacancies across all industries are expected to decline over time. From the qualitative study, we found mature workers and women with caregiving responsibilities face challenges such as having limited and unequal access to employment, facing skills gap barriers, and struggling to balance between their personal commitment and professional demands. By addressing the unique needs of mature workers and women with caregiving responsibilities, organisations can adopt successful workforce management strategies to cultivate a diverse and inclusive workplace.

Introduction

Today we are observing an unprecedented trend in the global population; people aged 65 years old and above are outnumbering children younger than five years old (United Nations, 2019a). By 2050, more than 1.5 billion people around the world will be aged 65 years and above (United Nations, 2019b). Population ageing and its impact on the Singapore labour force had been anticipated but have more recently come under the spotlight (Ministry of Finance, 2023; Seow, 2016). Provisions were made during Budget 2023 that acknowledged the value of mature workers and offered them support to remain longer in the workforce.

Singapore's workforce is ageing and will continue throughout the 21st century. The median age of Singapore's resident population has increased from 37.4 years to 41.5 years across the decennial census years 2010 and 2020 (Singapore Department of Statistics, 2021). The drivers for this development are the country's ultra-low fertility coupled with improving life expectancy at the older end of the age spectrum. In addition, with smaller birth cohorts being the norm over the last few decades, it has also contributed to a decline in the number of young people entering the labour force. Looking ahead and with the expectation that this demographic trend is unlikely to change, this would mean that in time the Singapore workforce for most sectors of the economy will be older. In addition, without the possibility of replacement by the local population or immigration, the workforce in most sectors will shrink. The creeping nature of the phenomenon will affect how the labour market functions, how businesses operate, the types of employment available, and the implementation of new policies to ensure sustainability (OECD, 2020), which will ultimately have an impact on industrial relations moving forward.

Strategies to Address a Shrinking Workforce

Some of the strategies adopted by countries grappling with slowing workforce growth include utilising robotic technology, equipping older workers with skills to enhance their employability, and providing flexible work arrangements to facilitate their continued participation in the labour market (Choi, 2016; Egdell et al., 2020; OECD, 2018b, 2018c). There is also a strong emphasis on promoting and protecting the health of older citizens to maintain a productive and engaged ageing workforce (Laishram & Melody, 2021; Thanapop & Thanapop, 2021).

In Singapore, businesses have adopted various strategies to address a shrinking workforce: First, the use of automation to overcome the manpower shortfall brought by population ageing and, in the process, seeking to meet their business goals; second, businesses have also tapped on other sources of manpower to complement the local labour pool to remain economically competitive. For instance, leveraging the foreign workforce to address its demographic challenges and while doing so, the Singapore government has enacted several policies to safeguard the interests of its local workforce and minimising the social costs to Singaporeans (Ministry of Manpower, 2022). The Singapore government has also encouraged mature workers to prolong their work lives to reduce strains on Singapore's labour supply. Amendments have been made to the Retirement and Re-employment Act to protract Singapore's retirement and reemployment ages to 63 and 68 years, respectively (Singapore Statutes Online, 2024). Besides the mature workers, businesses could also potentially tap on women with caregiving duties who may have difficulties returning to the labour force after having to leave their jobs due to their commitments like in Japan, another superaged society. Hong and Schneider (2020) posit that Japan's shrinking working age population will propel more women and elderly beyond the retirement age to join the labour pool. Similarly in Singapore, it is pertinent to explore existing available workforce that could potentially be tapped on to slow down the decline in manpower.

Promoting an Inclusive Workplace

To encourage mature workers to continue working, workplace policies would need to adapt to be more inclusive (Chen & Gardiner, 2019; Connell et al., 2015). Under the Tripartite Guidelines on Fair Employment Practices, Singapore has clear guidelines on non-discriminatory employment, including age discrimination. Employers are expected to avoid age-centric selection criterion unless "bound by legal or regulatory requirements" (Tripartite Alliance for Fair &

Progressive Employment Practices, 2019). They are also encouraged to reveal if a job is suitable for mature workers, in alignment with national efforts to improve employment opportunities for mature workers (Tripartite Alliance for Fair & Progressive Employment Practices, 2019). The Ministry of Manpower in Singapore will also be rolling out anti-discrimination legislation in 2024 to eliminate workplace discrimination and address unfair treatment at the workplace (Ministry of Manpower, 2023b). Furthermore, the Healthier SG initiative in Singapore targets preventive care through early detection of health issues and supporting an active lifestyle by forging long-term health-seeking habits. This shifts the onus of taking care of one's health onto the individuals in improving their quality of life (Ministry of Health, 2023). Additionally, the Ministry of Manpower has acknowledged that Singapore's fast ageing society continues to pose significant challenges as caregiver needs increase while the labour force shrinks. Thus, the Ministry of Manpower has launched the Tripartite Guidelines on Flexible Work Arrangement Requests in 2024 to support employees with caregiving responsibilities to be able to continue working or reenter the workforce (Tham, 2023).

In addition to examining the perspectives of mature workers, this study also examines the employment challenges faced by women with caregiving duties. Women, especially those from Asian countries such as Singapore, Japan, and China, experience pervasive societal expectations to take up more unpaid caregiving responsibilities than their male counterparts (Yoon, 2015). Chai et al. (2021) conducted a study with middle-aged Chinese men and women and found that women experienced employment income loss when more time is allocated to childcare. However, the effect of caregiving hours on income was not significant for men. Caregiving responsibilities are also not limited to providing care for children. With the strong emphasis on filial piety in Asian culture, daughters and daughters-in-law are expected to assume the primary caregiver role to provide care for the elders in the family (Chai et al., 2021). For instance, in China, the intensive caregiving duties placed on women result in a "double burden" where a combination of caregiving duties and their work responsibilities makes it more difficult for them to remain in their jobs and they are less likely to be employed (Chen et al., 2017). Although women could potentially cushion the reduced manpower supply in the workforce, their participation would most likely be contingent on a long-term change in attitudes towards women in the paid labour market as well as a subversion of the traditional role of women as caregiver in the family.

In view of these occurrences elsewhere, this paper examines the concerns and challenges faced by both mature workers and women with caregiving duties in Singapore. It explores the themes and types of initiatives necessary to increase the economic activity of women by removing some of the barriers faced by women who want to return to the workforce but are struggling to do so.

Research Questions

This study attempts to address the following research questions that are inexplicably linked:

- How would the future industry-specific labour force profile look like for the Singaporean economy as its resident population ages?
- What are the perceived and actual barriers and facilitators to staying in work for mature workers and women with caregiving duties?
- What are the desired forms of support for mature workers and women with caregiving duties to remain in employment?

Study 1

To understand the challenges posed by an ageing workforce in Singapore, it is pertinent to examine the current and future trends of the labour market. For this purpose, forecasting methods are employed to project changes in the workforce composition.

Methodology

The labour force projections were constructed by using quarterly data related to the labour market from https://beta.data.gov.sg/ and the Department of Statistics, Singapore. We used variables where quarterly data are available, as the use of quarterly data (as opposed to annual data) provides a larger sample size to accommodate more complex forecasting model specifications (such as having longer lags and the use of lagged covariates) (Ministry of Manpower, 2023a). We also employed data that had been updated. For instance, variables such as "Workers Made Redundant, Annual" and "Resident Labour Force Aged 15 Years" were last updated in 2017. As such, although they are related to the labour market, we were not able to construct projections for them.

For the labour market time series indicators, we employed the following: employment change by industry, quarterly (in thousands); retrenched employees by industry group; and finally, job vacancy by industry group. Besides labour market variables, we used external covariates to improve our forecast. Our first external covariate is the consumer price index, a general indicator of price in Singapore. Our second external covariate is the gross domestic product (GDP) at current prices, which indicates the amount of output produced within Singapore. We used nominal GDP at current prices, as opposed to real GDP, as it is directly provided by the Singapore Department of Statistics data portal. As the purpose of the external covariates is to improve the predictive abilities of the forecasting model and are themselves not our focus, we used what is directly provided. Finally, our third external covariate is the value added per worker. Since our study focuses on the labour market, we may think about this covariate as capturing the general productivity of workers in Singapore. To employ the external covariates, we transformed them by log differencing instead of using them in levels. This allows our external covariates to capture consumer price index inflation, growth in value added per worker, and GDP growth. Besides the fact that it is easier to interpret these variables in terms of growth, there is also clear evidence that they are nonstationary in levels, which makes them unsuitable for the forecasting exercise, and therefore should be converted into first differences before being employed.

To train the forecasting model, all available data for the labour market indicators are used. We plot the historical and forecasted values of the labour market indicators. A 20-quarter-ahead (i.e., five-year-ahead) forecast is constructed and plotted as a dash line. As the last data point for the labour market indicators varies at different dates, the end date of the available data series is shown in the figures above the vertical dotted line. The lightly shaded area surrounding the forecasted series represents the 95% confidence bands. We may interpret these confidence bands as showing the best- and worst-case scenarios for the forecast. For each regression model, we present two plots—one that presents the forecast of the labour market indicator using a model without external covariates, and another that presents the forecast of the same variable using a model with external covariates. The end date of the dataset is based on the latest data point available from https://beta.data.gov.sg/ obtained via the website's Application Programming Interface. We overlay grey ribbons to indicate the technical recession periods corresponding to the 2009 Global Financial Crisis and the 2020 Coronavirus disease 2019 (COVID-19) pandemic in the models.

Results

Figures 1–3 show the industry-specific employment growth for manufacturing, services, and construction industries, respectively. The black line represents the past data trend. The red line indicates the best-case scenario while the blue line indicates the worst-case scenario for the forecasts. The dash line represents the 5-year-ahead forecast.

Figure 1 shows that manufacturing employment growth has remained small over the last 20 years, where the average employment change in the sector per quarter is 0.63×10^3 (i.e., 630 per year). By contrast, in Figure 2 the services industry has added many positions, where the average quarterly employment increase in the sector is 14.45×10^3. Figure 3 shows that the average quarterly employment change in the construction sector lies between the manufacturing and services sectors, where 3.01×10^3 positions are added per quarter on average.

During the COVID-19 pandemic, the services industry experienced the sharpest decline in employment, where more than 150,000 jobs were lost. However, its recovery was rapid and its employment forecast is slightly positive, where service employment change will return to the pre-2015 trends. By contrast, the employment forecast for the manufacturing industry is less optimistic. Both models (with and without covariates) suggest that manufacturing employment change will dip below the long-term average and remain sluggish over the next 5 years. The employment forecast for the construction industry is the most bearish of the three sectors. By 2024, construction employment is expected to shrink and remain sluggish over the next 5 years.

Figure 1

Employment Change in Manufacturing

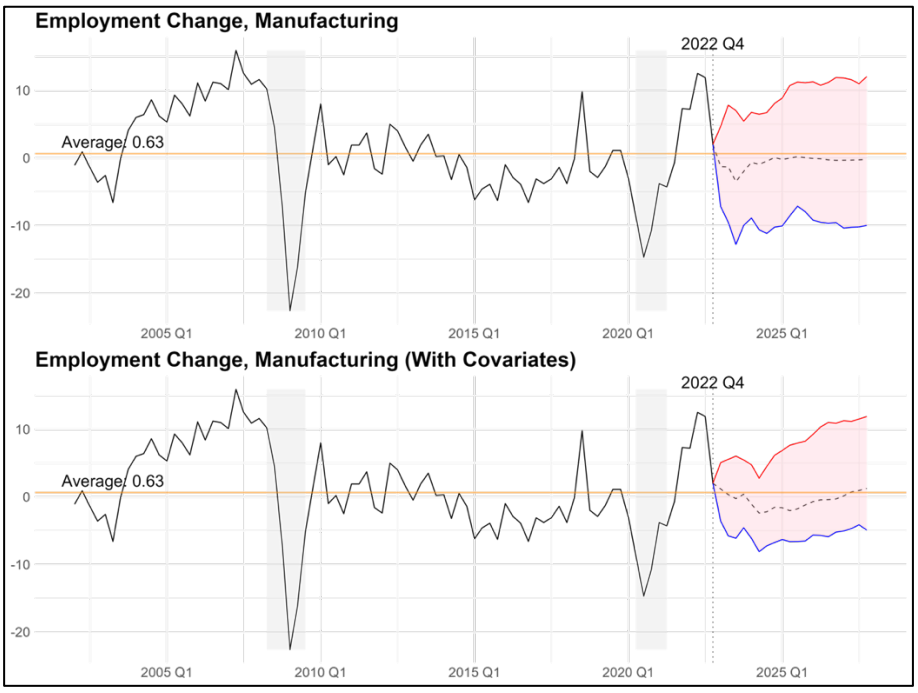


Figure 2

Employment Change in Services

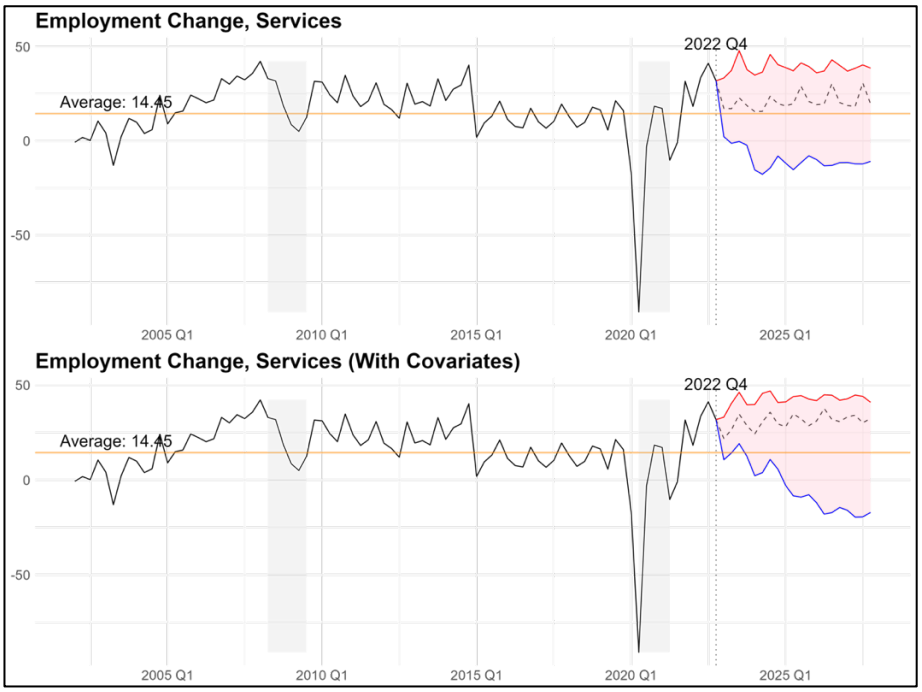
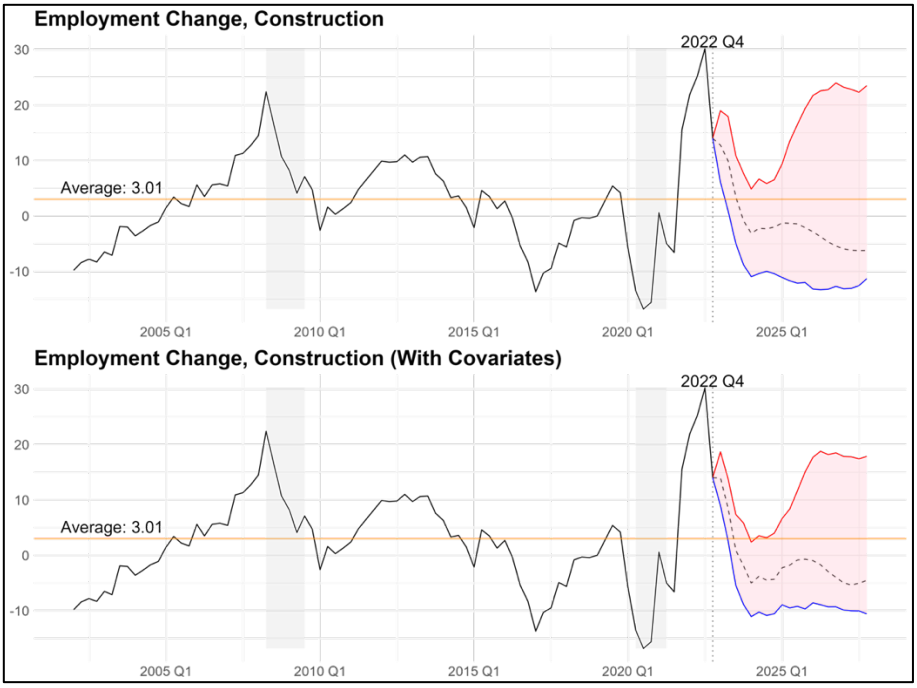


Figure 3

Employment Change in Construction



Figures 4–6 plot the numbers of employees retrenched in the manufacturing, services, and construction industries, respectively. While it is predicted that manufacturing employment is expected to decline (see Figure 1), this is mitigated by a slight decline in expected retrenchments in the industry (see Figure 4). Interestingly, for the services industry, Figure 5 shows that both models predict that retrenchments will increase initially, before declining towards the long-term average. For construction retrenchments, Figure 6 shows that the models with and without covariates predict the retrenchment trends differently. This may not be surprising when viewed from the lens of business cycle as the construction sector tends to be highly cyclical, and therefore, more volatile.

Figure 4

Retrenched Employees in Manufacturing

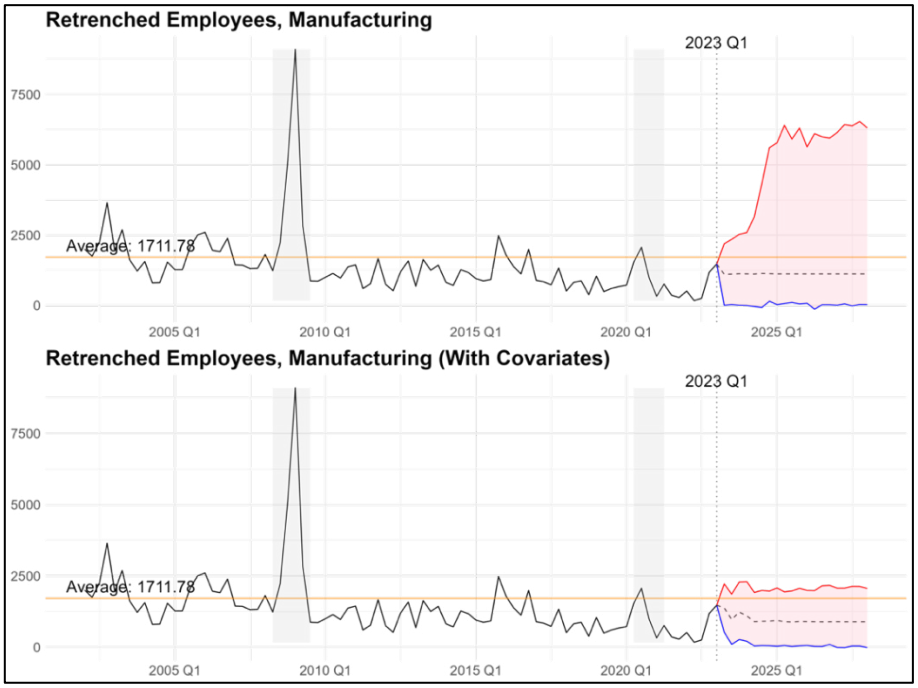


Figure 5

Retrenched Employees in Services

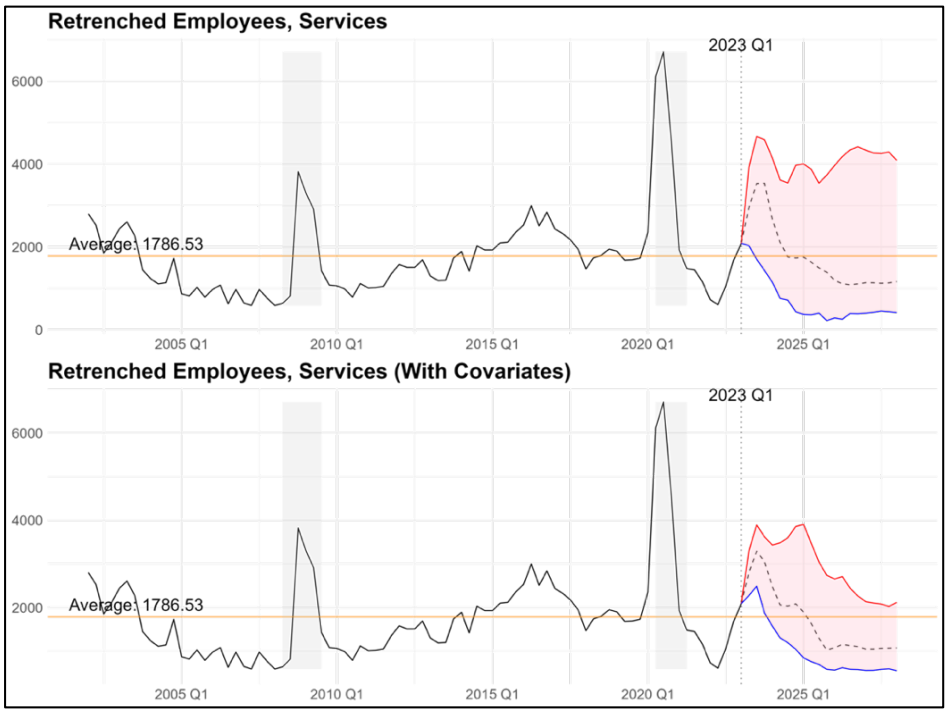
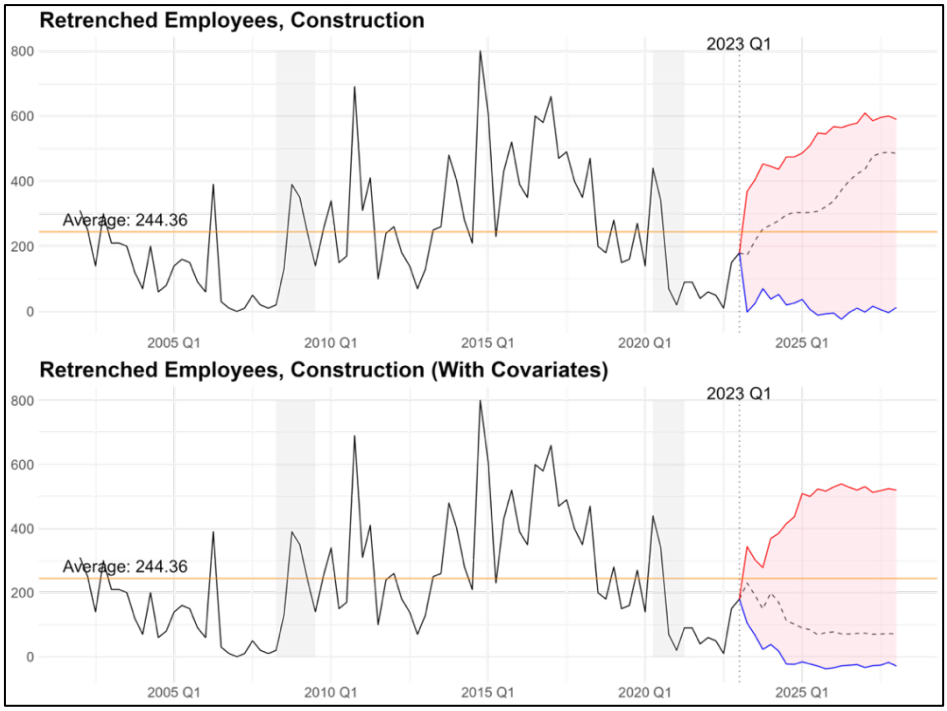


Figure 6

Retrenched Employees in Construction



Figures 7–9 plot the numbers of job vacancies for the manufacturing, services, and construction industries, respectively. For the manufacturing industry, Figure 7 shows a slight downward trend in job vacancies, as predicted by both models. Figure 8 shows that the number of job vacancies in the services industry was at its peak in 2020. A possible explanation is that the pandemic resulted in a mismatch of jobs and vacancies in the services industry, and those retrenchments in the sector during this period had left significant positions to be filled. Job vacancies in the services industry are expected to decline over the next 5 years, although they are expected to remain above the long-term average. Based on the model with covariates, Figure 9 shows that job vacancies in the construction industry are expected to decline. This is consistent with the forecasted employment change in construction shown in Figure 3, where employment in construction is expected to weaken over the next 5 years.

Figure 7

Job Vacancy in Manufacturing

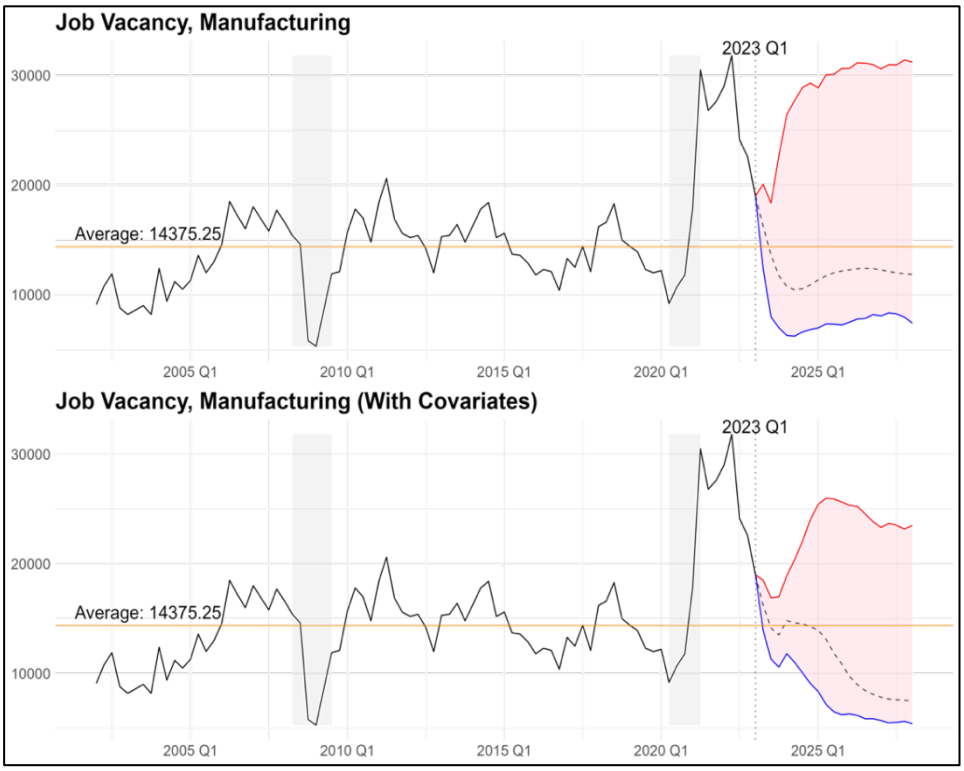


Figure 8

Job Vacancy in Services

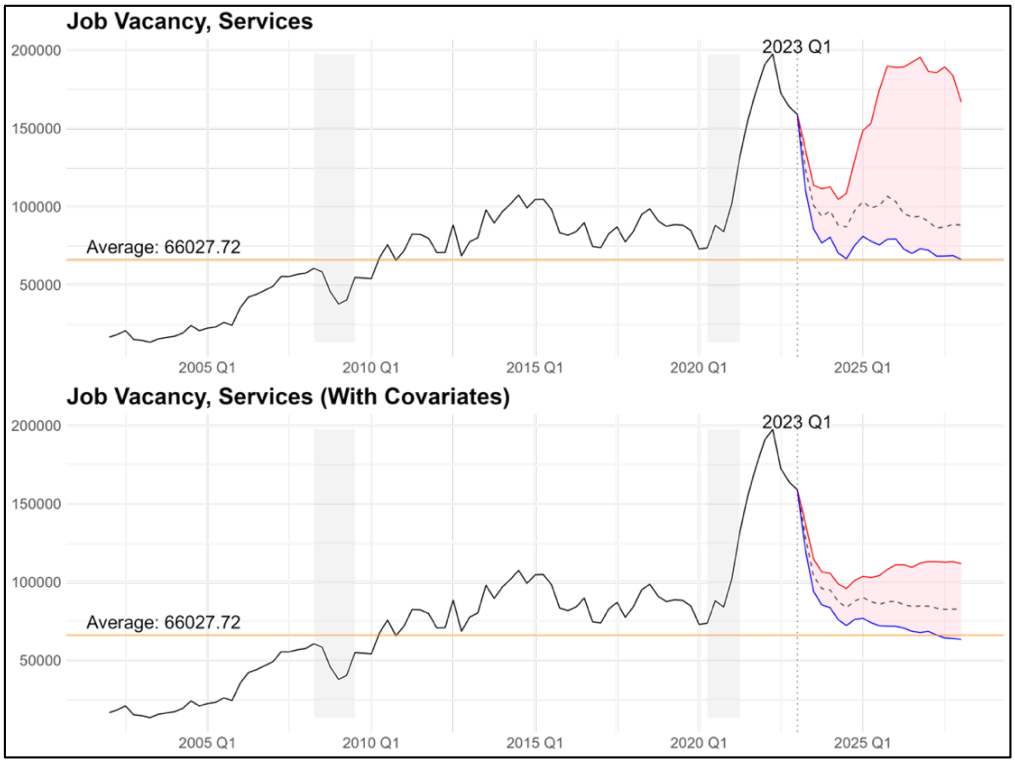
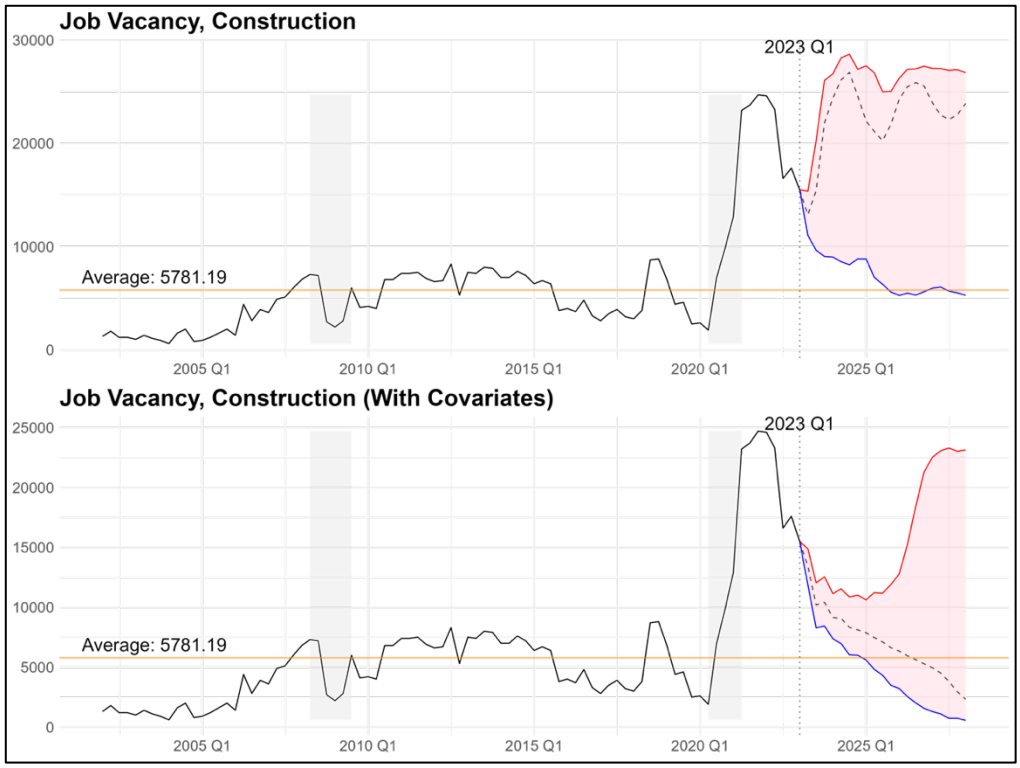


Figure 9

Job Vacancy in Construction



Study 2

The purpose of the focus group discussions (FGDs) centre around the challenges and possible means to support the reintroduction of mature workers and women with caregiving responsibilities back into the labour force, thereby potentially sustaining the local manpower pool considering the manpower situation as presented in the projections.

Methodology

Advertising posters were disseminated by the National Trades Union Congress through their contacts and channels to recruit participants. Participants who were interested to participate in the research could sign up on the Qualtrics survey form and indicate their preferred timeslot for the FGDs. Potential participants who met the inclusion criteria were contacted and provided with more information on the FGDs. The inclusion criteria were: (i) mature workers (45–65 years old) or (ii) women with caregiving duties (21–65 years old) and (iii) able to read and converse in English.

Forty-three participants were recruited to participate in the FGDs, 13 participants withdrew from the sessions for personal reasons. From January to June 2023, four FGDs sessions were conducted with 30 participants. Of the four FGDs sessions, three sessions were conducted at the Singapore University of Social Sciences' campus and one session was conducted at the National Trades Union Congress' meeting room. There were 13 participants who were mature workers without caregiving duties, 12 mature workers who were also women with caregiving duties, and five who were not mature workers but were women with caregiving duties. Twenty-four participants were females and six were males. Ages ranged from 25 years to 64 years old (M = 49.4 years, SD = 9.6).

Prior to the start of the FGDs, participants were informed that the session will be audio-recorded for transcribing purposes and the researchers may take notes to provide an audit and paper trail to strengthen the trustworthiness of the data. Participants were assured that no identifying information will be linked to their responses and that their participation was voluntary. Code numbers were used to identify participants instead of their real names. Participants were also told that they could refuse to answer any questions. Informed consent was first sought prior to the commencement of the FGD.

A semi-structured interview guide was used to gather insights from the participants. The average duration for the FGDs was 108.3 min. At the end of the session, participants received a S$25 NTUC FairPrice voucher in appreciation for their time.

All FGDs and interview sessions were transcribed verbatim by student assistants and completed transcriptions were cross-checked by the research assistant who verified them with the audio files to ensure their accuracy. Verified transcriptions were loaded into MAXQDA for further analysis. Thematic analysis was used to analyse the transcripts. Lower-order themes were assigned with labels that are as close to the participants' words while higher-order themes were assigned with labels using the language of social science.

Results

We reviewed some of the barriers faced by mature workers and women with caregiving duties in finding employment and staying in it. Next, we examined the facilitators that helped them in finding and staying in the employment. Finally, the additional support that they feel will help them in their employment. Table 1 summarises the themes and categories raised from the FGDs.

Table 1

Themes and Categories

<table>
<tr><td colspan="2">What are the perceived and actual barriers and facilitators to staying in work for women with caregiving duties and mature workers?</td></tr>
<tr><td>Actual and perceived barriers</td><td>Perceived facilitators</td></tr>
<tr><td>Having limited and unequal access to employment
Hiring bias due to ageism and stereotypes against mature workers
Difficulties in reentering the workforce after a long period of unemployment
Experiencing caregiver discrimination
Facing skills gap barriers
Gap between training content and required job skills
Having to keep up with new technology and lack of support
Struggling to balance personal commitment and professional demands
Restricted employment prospects to manage caregiving duties
Concern over job security
Experiencing stress when managing dual responsibilities of caregiving duties and work</td><td>Staying relevant to industry
Acquiring industry-relevant skills
Having a strong professional network
Adapting to career transitions to remain in the workforce
Flexibility as a workplace norm
Providing spatial and temporal flexibility
Providing flexible work options
A workplace culture of respect and empathy
Recognising the value of mature workers
Empathising with employees’ needs</td></tr>
<tr><td colspan="2">What is the desired support for mature workers and women with caregiving duties?</td></tr>
<tr><td colspan="2">Promoting an inclusive society
Addressing ageism in hiring and protecting mature workers’ rights (Implemented but requires enforcement)
Creating awareness of the responsibilities of caregiving (New suggestion)
Bridging the gap between skill acquisition and employment
Incorporating internships and apprenticeships in upskilling programmes (New suggestion)
Implementing needs-specific human resources (HR) policies and support
Offering more varying employment contracts (Implemented)
Providing more health care benefits (Implemented but requires enhancement)</td></tr>
</table>

- Implementing profamily leave system (Implemented but requires enhancement)
- Assigning a buddy to facilitate learning (Implemented)
- Organising workshops on caregiving (New suggestion)
- Having structured HR conversations on retirement options (Implemented by unions and some organisations)

To find out the barriers mature workers and women with caregiving duties faced when finding employment and staying in employment, we asked the participants these questions:

- What are the factors that made it challenging for you in finding a job?
- What are some of the instances that had made you think twice about staying in your current job?
- What were some of the challenges that you faced as a mature worker/woman with caregiving duties in continuing to work?

Theme 1: Having Limited and Unequal Access to Employment

Hiring Bias Due to Ageism and Stereotypes Against Mature Workers

Difficulty in finding a job due to age was an actual barrier mentioned by many mature workers. They shared that it may be due to the stereotypes that mature workers "of a certain age cannot be retrained or un-coachable, cannot be re-integrated":

> There's an underlying premise that we can't seem to catch up and simply because there's a tech thing, but did anyone check in whether we can or we cannot? I don't think there's a checking in, I think it's just a blanket assumption that you reach a certain age, you are unfamiliar with mobile [devices] even. (P23, mature worker with caregiving duties, 54 years old)

Although the Fair Consideration Framework (Ministry of Manpower, 2023c) sets out the requirements to ensure companies abide by the fair hiring practices, participants mentioned that they still encountered discriminatory (HR) practices. The following is an example of the experience faced by a participant:

> When I look for a job, especially those who leave their telephone number, we can call them. They said, *How old are you?* Then when you say you are at this age. They said, *We accept applicants up to 35*. Even for part-time job, not a full-time job. (P3, mature worker with caregiving duties, 53 years old)

Difficulties in Re-entering the Workforce After a Long Period of Unemployment

Re-entry to the workforce is a challenge especially for those who have been away from the workforce to take care of their children or elderly parents. Many shared that they struggled because their skills are no longer relevant:

> After seven years of stopping work right, now if you want me to go back into full-time employment, I will have to take baby steps again. Because to an extent I have lost touch you know with the progress of that is in organisations maybe the process you know. So, if I still want to go back to...I will probably have to start somewhere…less maybe skill intensive type. (P30, mature worker with caregiving duties, 62 years old)

Participants also shared that the negative perceptions many potential employers have regarding long periods of unemployment made it more challenging. Participants highlighted that these unemployment periods, because of caregiving duties, were viewed unfavourably by potential employers. Potential employers tend to perceive it as a period of career stagnation and considered the unemployment gap as a disconnect with the industry; past experiences were not

valued, and the skills and knowledge regarded as outdated. Even mature workers in managerial positions previously who have taken a career break were only offered entry-level positions on their re-entry.

Experiencing Caregiver Discrimination

Participants with caregiving duties felt discriminated at the interview stage by potential employers who question their work commitment level and productivity. Participants were concerned with how potential employers will view the demands of caregiving as a hindrance to their dedication to their job and performance. This suggests that there might be a barrier for reentry whether real or perceived:

> Even in the past, recruiter will ask how old is my daughter, who is taking care of her. But I am the one that is looking for a job. Not her, right? Yeah so, I think they are pivoted into that direction where if you have a younger child, more attention will be on child. Might not so much on the work, or something like that. But we are also trying our best to strike a balance, which I find a bit tough. (P24, woman with caregiving duties, 34 years old)

Theme 2: Facing Skills Gap Barriers

Gap Between Training Content and Required Job Skills

Mature workers do recognise their lack of skills and took the initiative to upskill. However, they still face difficulties in finding employment as the knowledge that they acquired through the training was too basic. This made it hard for them to secure employment as some of these companies do require them to have a few years of practical experience in the relevant field:

> The company wants someone who has experience in it for five years. It's like you just come out, what experience you got? You know, so it's redundant…my diploma (P28, mature worker with caregiving duties, 52 years old).

Having to Keep Up With New Technology and Lack of Support

Mature workers shared that they must learn and relearn new processes and new technologies that are being implemented at their existing workplace or when they transit to new jobs. This was a challenge for them because some felt that the training was inadequate, and they were often left to figure things out on their own:

> I just changed my division one year ago, to do a new type of job and now I'm still learning after one year. I'm still like quite new…so everything now is like self-learnt. When you ask someone, is like what she said, read up yourself you know, there's not actually like last time really demonstrate for you to see. Now is like *ok you read up yourself, I give you the instruction, okok you go read yourself you know, whether you know or not then just see how.* (P16, mature worker, 50 years old)

Theme 3: Struggling to Balance Personal Commitment and Professional Demands

Restricted Employment Prospects to Manage Caregiving Duties

For participants with caregiving duties, they shared the struggle that they faced while simultaneously attending to their caregiving responsibilities and staying in employment. Participants shared they shifted to part-time employment because they needed to devote more time to caregiving as they had no additional help (e.g., being the only child to elderly parents) or were unable to find alternative caregiving arrangements (e.g., infant care):

> I mean there are shortage of infant care [centres] and there are shortage of childcare [centres] ... I want to seek for a job so I need to have proper arrangement for my daughter. I actually call the infant care [centre] to ask, *do you have a place a vacancy*, they say *you*

> *will be on the waitlist*. My next question is *Ah, how long is the waitlist?* I'm like [queue number] 100 plus on the waitlist. (P24, woman with caregiving duties, 34 years old)

Similarly, a few participants shared that the nature of their work made it impossible for them to continue providing care while working and they had to leave their job. A few participants shared that they had to quit their jobs because the care recipient's condition had deteriorated and needed more caregiving. Thus, they either quit their jobs or take on entry-level roles with less responsibilities but with significant pay cuts to manage the increasing family commitments.

Concerns Over Job Security

Participants also shared their concerns over their job security due to their caregiving duties:

> My colleagues are actually physically working at their desks and I'm the one who is like a deserter to them but I'm actually the one supporting them you see. So, it's a private arrangement between me and my boss but then like I said I don't know how this arrangement can last. So, it's like I always feel very insecure. What if let's say this job no more then, what can I do next. (P18, mature worker with caregiving duties, 52 years old)

Experiencing Stress When Managing Dual Responsibilities

Participants expressed that they experienced inner conflict as they juggle to fulfil their role as a mother while trying to maintain a successful career. Some of this stress stems from the high expectations placed on women with fulfilling their caregiving roles:

> Life is still full of struggle and challenges. Especially these few years. I'm also trying hard to be a good mum and take care of my family, hoping to fulfil all my commitments well. (P29, mature worker with caregiving duties, 50 years old)

Participants also expressed that some of their workplaces lacked compassion for their circumstances, and questioning and scrutiny was commonplace when they needed to take caregiving leave. There is also added stress because they need to rely on their colleagues to take on their work in their absence.

The following questions were asked to identify the facilitators for finding and remaining in employment:

- What are the factors that have helped you in finding a job?
- What are the factors that made you want to work longer in the company?
- What are the working arrangements/working conditions that you think were good in supporting you as a mature worker/woman with caregiving duties?
- What were some HR policies that were implemented that you think were helpful for you as a mature worker/woman with caregiving duties?

Theme 1: Staying Relevant to Industry

Acquiring Industry-Relevant Skills

Participants expressed that the success rate of finding employment also depends on whether one has the relevant skillsets required by the market:

> The skills that you have at that moment require in the market. So, for example, I learn cybersecurity right, now is a piece of a hotcake in the market and a lot of people know that you know this, they will want to talk to you on this topic first, whether you are really in-depth in this area, but at least they talk to you to see whether you are able to have that kind of level to join the company. At least you get yourself a higher chance of getting an interview. (P11, mature worker, 53 years old)

A few participants have tapped on the various government initiatives to improve their job prospects with initiatives providing internships/emplacement helpful especially when transiting to a new industry. Having the relevant skillset is important; but one participant also shared that it is crucial to demonstrate their acquired skillset through the projects completed.

Having a Strong Professional Network

Participants faced difficulties finding employment through the traditional route of submitting their resumes to organisations. However, having a strong professional network opened the doors to job opportunities and for some strengthened the chances of employment from referrals and connections:

> The right people at the right time because it is important for us to get connected with our previous, you know, our ex-colleague or our bosses. You know it is always important to maintain relationship. It comes in handy when you're out there looking for other opportunities, I mean when you have the connection right, you will also feel comfortable to reach out to them. So, I feel networking and maintaining relationships. (P15, mature worker with caregiving duties, 45 years old)

Adapting to Career Transitions to Remain in the Workforce

A few of the mature workers highlighted that as many of them tended to hold higher positions in the past, it was important to recalibrate their expectations. For example, adjusting to new employment in a lower position or work on a project basis and being open to learning new skills would help mature workers to keep up with the industry trends and remain in employment.

Theme 2: Flexibility as a Workplace Norm

Providing Spatial and Temporal Flexibility

Many of the participants shared that they appreciate the flexibility that their organisations have provided for them in terms of *spatial flexibility* and *temporal flexibility*. This was important for both mature workers and women with caregiving duties as many participants shared that the flexibility provided allowed them to attend to their personal matters and commitments such as medical appointments and caregiving responsibilities.

Similarly, a hybrid work model where employees are allowed to work from home was also perceived to be beneficial to those with caregiving duties:

> For the past few years, I switched from working on-site to becoming mainly from home as a part-time tuition coordinate-coordinator. My boss runs a tuition agency, and he needs help from me to do tuition matching for his group of tutors under him. My timing is quite flexible ... because past few years my mother-in-law is having the early stages of dementia. (P29, mature worker with caregiving duties, 50 years old)

Providing Flexible Work Options

For both groups having flexibility in their jobs was also one of the most mentioned factors when they seek employment. Mature workers prioritised flexibility in their jobs rather than career progression. This is because the flexibility offered more "work-life balance" allowing them to transition to a slower pace of work—less stressful and manageable while earning a stable income together with the opportunity to pursue other personal interests.

Some mature workers shared that as they aged, they experienced lower stamina which affected their job preferences (e.g., slower pace of work, shorter hours, and part-time work):

> I actually move from my previous employment I was handling marketing so I realised that age does matter as I play as I grow older, I realised that my own stamina may not be able

> to kick up off of those fast-paced work which is marketing. (P13, mature worker, 55 years old)

Theme 3: A Workplace Culture of Respect and Empathy

Recognising the Value of Mature Workers

For mature workers, it was also important for them to be in organisations with an age-inclusive work culture where they are respected for their experiences:

> I work for my company ever since when I first graduated. I worked for 6 years. After that, I left the company and worked in other companies and end of the day, I went back to that company again and worked for another 4 years, so total is 10 years. So basically, why I go back is because of the culture of the company where the boss treats the employees just like a family. (P5, mature worker with caregiving duties, 47 years old)

Empathising With Employees' Needs

Many of the participants perceived the flexibility at work to be largely enabled by their supervisors. Participants shared how their supervisors were empathetic to their individual circumstances and trusted them to get their work done without micromanaging them:

> Because my boss is quite understanding and trusting. So, he trusts that I would meet my job quota while trying to fulfil my family commitment as well. He's also very understanding that I have my caregiving duties ah. At times I mean, I maybe a bit unable to fulfil his expectations, he is also willing to be lenient and understanding. That's what I appreciate, and I continue to work for him. (P29, mature worker with caregiving duties, 50 years old)

Women with caregiving duties were concerned with having their colleagues cover their work when they had to apply for urgent leave to attend to family emergencies. Hence, having supportive colleagues was important to them.

A work culture that is caring towards its employees and promotes work-life balance was mentioned to be important facilitators of staying in employment:

> To know that you have a caring environment rather than you know, you're just one labour unit, FTE (*Full time equivalent*). I think a win-win solution for a company is really a company … who shows the employee that you're being valued, and of course then the employee has to be contributing. So, my experience has been very good. (P19, mature worker with caregiving duties, 52 years old)

The following questions were asked to find out the type of support the participants hoped to receive when they looked for employment:

- What do you think can better help you to find a job?
- What changes do you hope to see in your company that could better support mature workers/women with caregiving duties?

Theme 1: Promoting an Inclusive Society

Addressing Ageism in Hiring and Protecting Mature Workers' Rights

As highlighted previously, mature workers faced hiring bias and age discrimination. Participants hoped more could be done in ensuring mature workers receive equal opportunities and have a more transparent hiring process:

> I don't think is only awareness. If you try to change it with awareness, and like maybe you talk to the HR people. You say, *Can't do this, right*? But nobody is monitoring it. The sentiment is there, the ageism, the racism, the whatever-isms are there, you know, it will continue. So, it needs to be, there needs to be some form of checks in the system.

> Whether it's random or not, right, for people to say, *Hey, I was really in alignment for this job. Why didn't I get this job*? And to trigger some, you know, some, some evaluation of who got the job? Why they got the job? (P2, mature worker with caregiving duties, 53 years old)

One participant who witnessed unfair dismissal at her workplace suggested for processes to protect their rights; for example, to have independent agencies administer and audit exit interviews and ensuring feedback to the organisation is anonymous.

Creating Awareness of the Responsibilities of Caregiving

Some of the participants highlighted that they hoped for their colleagues to be more empathetic to their circumstances and understand the struggles they have as a caregiver. Participants suggested that such understanding can be fostered through various HR initiatives such as "bring your loved ones to work" initiatives, caregiving workshops, and home visits.

Theme 2: Bridging the Gap Between Skills Acquisition and Employment

Incorporating Internships and Apprenticeships in Upskilling Programmes

While participants shared that they have benefited from the SkillsFuture initiative, one of the most cited issues was the difficulty in finding employment even after completing their courses. Participants suggested that training providers collaborate with industry partners to offer internship opportunities. These opportunities provide a platform for them to apply their knowledge to real-world practical settings and showcase their ability to prospective employers.

Theme 3: Implementing Needs-Specific HR Policies and Support

Offering More Varying Employment Contracts

Many of the mature workers highlighted their preference for part-time jobs because they perceive them to be less stressful and offer flexibility. With differing needs, participants suggested that organisations explore offering part-time or freelance opportunities. One participant shared her observation of "job sharing" practices that provide employment opportunities for mature workers. Other participants were supportive of this suggestion because they could better manage their caregiving responsibilities and work:

> I have from a friend who lives in Adelaide. In that region, because I think of job shortages, they encourage part-time working. What happens is that of five days right, they will have like two persons doing five day's work. So maybe one do Monday, Tuesday, another one will be like Wednesday, Thursday. And Friday maybe they alternate or something. So it's a part-time arrangement and in fact, for them there's no incentive to do more because they are actually going to be penalised by income tax. That is really to help more women who have constraints to be able to manage both. (P19, mature worker with caregiving duties, 52 years old)

Being a caregiver places demands on their time and energy. However, participants also shared that they need to continue working to meet their financial needs. One of the suggestions provided by participants was to have a platform where they could look for freelance jobs that they could fit into their schedules.

Providing More Health Care Benefits

In terms of health care benefits, mature workers hope for organisations to organise more health talks, subsidised health screening packages, and to provide funds for them which they could use to purchase health supplements. For those with caregiving duties, they have suggested that such benefits extend beyond their spouse and dependents (e.g., parents,

grandparents). Participants highlighted that they tend to focus more on their health as they age. By providing such health benefits, it adopts a preventive approach to help them stay healthy.

Implementing Profamily Leave Systems

Participants shared that they hope to see improvement in the leave systems that could recognise the demands of caregiving and better able to accommodate employees who need to take time off to take care of their children or parents. For example, participants suggested that parental care or family care leave be made compulsory for all organisations to provide, and that family care leave should not come with an age restriction:

> Family Care Leave, once your child hits 18, or if he is 12, you cannot use for them. That means if your child is sick, you cannot take Family Care Leave to look after them. So that is the downside of it. Which hopefully the policy can change. Because it's Family Care Leave but there is an age restriction to it. So that makes it very difficult. (P6, mature worker with caregiving duties, 56 years old)

Assigning a Buddy to Facilitate Learning

Participants shared that there are instances where they had to learn on their own and find answers on the Internet. They preferred hands-on training and guidance from their colleagues. Participants suggested that organisations assign them a buddy to help them to learn new processes and technology:

> The organisation I was part of has this buddy system because the job was very sensitive dealing with government and political, so buddy system really helps. Especially when new employees come, they will see the mud on the ground and it was very challenging so, they need to be hand-held for a case few so they can get them into these situations and challenges, buddy system really helps. (P15, mature worker with caregiving duties, 45 years old)

Organising Workshops on Caregiving

As the demands of caregiving increase, participants hope for organisations to arrange workshops to improve the caregivers' knowledge and skills. Some of the examples provided by participants include first-aid skills, self-care for caregivers, and taking care of people with different conditions (e.g., dementia).

Having Structured HR Conversations on Retirement Options

Participants shared the importance of HR to engage mature workers in their career planning and retirement plans. Participants agreed that HR professionals would need to be trained in coaching to help mature workers identify the skills they need to stay relevant and have conversation with employees on their retirement plans, ideally 5 years before their retirement age:

> Like a pre-package for you, maybe 3 options like because different people have different needs. Some people may have elderly to take care of, but some people may have lost their parents at a young age … like, 5 years down the road, do you wish to have 10% cut, but you have how many more days. The other one probably is to switch to part-time. But this is not a fixed thing but at least there are 3 options for you to pre-plan. (P5, mature worker with caregiving duties, 47 years old)

Discussion

We shed light on the outlook of the labour market and how the ageing population may affect labour trends in the manufacturing, services, and construction industries. Based on the

forecasting results, the labour force will experience more changes in the years to come. From the industry-specific labour force projections, it can be observed that there will be headwinds encountered by the manufacturing and construction industries regarding employment growth. In the long run, job vacancies are expected to decline with job seekers spending long periods seeking employment. Such changes in the labour force will have an impact not only on the way businesses are run but on how the existing manpower will be managed. We can infer from the observations made in this research that the labour pool will shrink and at some point, businesses will have to rely on less traditional sources—mature workers and women with caregiving duties. They could either be in the workforce or be encouraged to return to the workforce. The qualitative study seeks to examine how to better support mature workers and women with caregiving duties to foster an inclusive workplace.

The FGDs revealed the most mentioned barrier faced by mature workers was the difficulty in finding a job because of their age. In addition, despite upskilling efforts, many still face difficulties in finding employment because the knowledge they acquired through the training was too basic. There exists a discrepancy in expectations between job seekers and employers. Job seekers who have upgraded their skills anticipate securing employment upon acquiring foundational competencies. However, employers are seeking new entrants with advanced skills and previous relevant experiences. They also felt that not much support was given to them to guide them through new processes and new technologies. This corroborates with a report that showed that age discriminations, compounded by negative stereotypes towards mature workers, are still troubling issues that plague the workforce in the European Union (European Commission, 2019). It is imperative to revise this obstructive narrative that employers identify with regarding the capabilities of mature workers. Innovative methods that have been designed include the “Life is passion” campaign in Poland, featuring television and other media coverage that defies the stereotypical negative attributes of older people and substitutes them with favourable images (OECD, 2015). A more legislative approach to impede age discrimination is through official laws and constitutions. Most countries have enacted anti-discrimination policies that forbid ageist employment practices such as the Age Discrimination in Employment Act in the United States (OECD, 2018a). Advocating for a diversity-valuing organisational culture in MNCs and SMEs would be beneficial in challenging these existing conventional views that pervade through systemic structures.

For both mature workers and those with caregiving duties, long periods of unemployment make it more challenging for them to reenter the workforce as potential employers would perceive their skills as obsolete. Existing programmes typically focus on training unemployed workers, assisting in matching job seekers to job vacancies, and networking opportunities to help mature workers form social and support networks (Wandner et al., 2018). However, there is growing evidence of personalised solutions such as profiling and assessments by trained career counsellors, followed by career guidance counselling and trainings to address worker motivations and self-confidence (European Commission, 2019). Personalised action plans were established to tackle the training needs of mature workers before giving them job placement support (OECD, 2015, 2018b, 2018c). These trainings and career programmes encourage upskilling to increase the competency of mature workers who otherwise may continue to face unemployment because of outdated skills or the lack of qualifications that are deemed necessary for the current job market.

The FGDs also revealed that, despite the unique challenges faced by both groups, there were similarities in the facilitators that assist them in employment. First, the need for a more inclusive workplace culture. Promoting inclusivity spanned options like profamily and age-friendly HR practices; to having open conversations with employees; and to seeing how organisations can also serve their interests while fulfilling business outcomes. This is crucial given an ageing workforce coupled with low birth rates, the phenomenon of a “sandwiched generation” will also become more prominent.

There is also an emphasis on flexibility that the two groups value when considering employment and remaining employed. The self-governance over the control of one’s schedule is especially critical for helping mature workers manage their work and personal commitments. A flexible work environment allows them to perform their professional roles in a manner that

complements their life circumstances. Aligned with existing research on flexibility at the workplace, flexibility in working-time arrangements was found to be significant especially for older men and women involved in caregiving duties. The autonomy over their working hours not only encourages prolonged participation in the workforce but also improves the general welfare of employees (Noone et al., 2018).

With the demographic shift, it is paramount that organisations put in place more tailored strategies or policies that will serve the needs of their mature workforce and women with caregiving duties. While the dimensions of workplace satisfaction are considered by employees, whether these practices are specifically catered to sustain both the workforce depend very much on the interests of both employers and upper management authorities.

The Labour Movement may wish to consider gearing their initiatives and championing for a more integrated workforce where mature workers, youths, and women with caregiving duties are adequately supported in ensuring their assimilation into a technologically advanced workplace. As the current position taken by the Labour Movement is directed heavily towards reemployment of mature workers through upgrading and upskilling programmes, it can further expand their efforts to offer internship opportunities for workers to apply their skills in prospective organisations with the possibility of employment on completion of internships, as well as consider shifting the nature of job applications from online platforms to social networking. In the context of change management, trade unions play a mediating role in terms of buffering the tension between mature workers and organisations. The trade unions play a role in encouraging mature workers to embrace open-mindedness and adapt to changes, while also advocating with organisations to allocate additional time for mature workers to make necessary adjustments.

This research is not without its limitations. The future labour force projections are limited to the three industries (manufacturing, services, and construction) and focus on the general employee profile. Future studies could expand on the industries in Singapore as well as focus on the projection for mature workers. The FGDs have also predominantly involved participants from white-collar occupations. In addition, we have examined the perspectives of women with caregiving duties. During the discussions, we have observed that the caregiving burden is also experienced by men. Future studies could include the perspectives of blue-collar workers and men with caregiving duties.

Conclusion

Promoting the employability of mature workers while enhancing employment opportunities for them will lead to longer, more rewarding careers that generate benefits not only on an individual scale but also at the national level. In the context of population ageing, mobilising the potential labour force effectively and sustaining high productivity regardless of age are critical. A healthy workforce with up-to-date skills and a more accommodating employment system are necessary to achieve this goal.

Drawing on our research findings, we can extract several lessons and subsequently identify good practices to respond to current and looming demographic challenges. By taking the necessary pre-emptive measures and making changes to align and meet the challenges posed by population ageing and slowing labour force growth, organisations and the Labour Movement can support employees and employers to achieve better business outcomes that can benefit all parties, and thereby produce a vibrant economic outlook despite the impending challenges.

BIOGRAPHIES

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REFERENCES

Chai, H., Fu, R., & Coyte, P. C. (2021). How do middle-aged Chinese men and women balance caregiving and employment income? *Healthcare (Basel, Switzerland)*, *9*(4), Article 415. https://doi.org/10.3390/healthcare9040415

Chen, M. K.-L., & Gardiner, E. (2019). Supporting older workers to work: A systematic review. *Personnel Review*, *48*(5), 1318–1335. https://doi.org/10.1108/PR-11-2018-0455

Chen, L., Zhao, N., Fan, H., & Coyte, P. C. (2017). Informal care and labor market outcomes: Evidence from Chinese married women. *Research on Aging*, *39*(2), 345–371. https://doi.org/10.1177/0164027515611184

Choi, E. (2016). Older workers and federal work programs: The Korean Senior Employment Program (KSEP). *Journal of Aging & Social Policy*, *28*(4), 308–324. https://doi.org/10.1080/08959420.2016.1153993

Connell, J., Nankervis, A., & Burgess, J. (2015). The challenges of an ageing workforce: An introduction to the workforce management issues. *Labour & Industry: A Journal of the Social and Economic Relations of Work*, *25*(4), 257–264. https://doi.org/10.1080/10301763.2015.1083364

Egdell, V., Maclean, G., Raeside, R., & Chen, T. (2020). Age management in the workplace: Manager and older worker accounts of policy and practice. *Ageing and Society*, *40*(4), 784–804. https://doi.org/10.1017/S0144686X18001307

European Commission. (2019). *Employment, social affairs & inclusion*. https://ec.europa.eu/social/main.jsp?catId=1122&langId=en&intPageId=4993

Hong, G. H., & Schneider, T. (2020). *Shrinkanomics: Policy lessons from Japan on aging*. International Monetary Fund. https://www.imf.org/en/Publications/fandd/issues/2020/03/shrinkanomics-policy-lessons-from-japan-on-population-aging-schneider

Laishram, L., & Melody, T. (2021). Policy reforms and changing intergenerational support of elderly in India. *Journal of Population Research*, *38*(4), 401–416. https://doi.org/10.1007/s12546-021-09275-z

Ministry of Finance. (2023). *Growing our economy and equipping our workers*. Budget 2023. https://www.mof.gov.sg/singaporebudget/budget-2023/budget-statement/d-growing-our-economy-and-equipping-our-workers#emEquipping-and-Empowering-Our-Workersem

Ministry of Health. (2023). *Living life to the fullest—2023 action plan for successful ageing*. The Ministerial Committee on Ageing. https://www.moh.gov.sg/docs/librariesprovider3/action-plan/2023-action-plan.pdf

Ministry of Manpower. (2020). *Skills upgrading*. *Employment practices: Skills, training and development.* https://www.mom.gov.sg/employment-practices/skills-training-and-development/skills-upgrading

Ministry of Manpower. (2022). *Factsheet on foreign workforce policy announcements at COS 2022*. https://www.mom.gov.sg/-/media/mom/documents/budget2022/updates-to-ep-framework.pdfhttps://www.mom.gov.sg/-/media/mom/documents/budget2022/updates-to-ep-framework.pdf

Ministry of Manpower. (2023a). *Labour force in Singapore 2022*. https://stats.mom.gov.sg/iMAS_PdfLibrary/mrsd_2022LabourForce_survey_findings.pdf

Ministry of Manpower. (2023b). *Government accepts Tripartite Committee's final recommendations for WFL*. https://www.mom.gov.sg/newsroom/press-releases/2023/0804-government-accepts-tripartite-committee-final-recommendations-for-wfl

Ministry of Manpower. (2023c). *Fair Consideration Framework (FCF)*. https://www.mom.gov.sg/employment-practices/fair-consideration-framework

Noone, J., Knox, A., O'Loughlin, K., McNamara, M., Bohle, P., & Mackey, M. (2018). An analysis of factors associated with older workers' employment participation and preferences in Australia. *Frontiers in Psychology*, *9*, Article 2524. https://doi.org/10.3389/fpsyg.2018.02524

OECD. (2015). *Ageing and employment policies: Poland 2015*. https://doi.org/10.1787/9789264227279-en

OECD. (2018a). *Ageing and employment policies: United States 2018: Working better with age and fighting unequal ageing*. https://doi.org/10.1787/9789264190115-en

OECD. (2018b). *Working better with age: Japan*. https://doi.org/10.1787/9789264201996-en

OECD. (2018c). *Working better with age: Korea*. https://doi.org/10.1787/9789264208261-en

OECD. (2020). *Promoting an age-inclusive workforce: Living, learning and earning longer*. https://doi.org/10.1787/59752153-en

Seow, C. (2016). Singapore confronts an aging population. *The New York Times*. https://www.nytimes.com/2016/03/08/business/international/singapore-confronts-an-aging-population.html

Singapore Department of Statistics. (2021). *Population trends 2021*. Ministry of Trade & Industry. https://www.singstat.gov.sg//media/files/publications/population/population2021.pdf

Singapore Statutes Online. (2024). *Retirement and Re-employment Act 1993*. Attorney-General's Chambers of Singapore. https://sso.agc.gov.sg/Act/RRA1993?ProvIds=P13-#top

Tham, D. (2024). *All employers must have process for workers to request flexible work arrangements from December*. CNA. https://www.channelnewsasia.com/singapore/flexible-work-arrangement-requests-tripartite-guideslines-employers-employees-4266831

Thanapop, S., & Thanapop, C. (2021). Work ability of Thai older workers in Southern Thailand: A comparison of formal and informal sectors. *BMC Public Health*, *21*, Article 1218. https://doi.org/10.1186/s12889-021-10974-8

Tripartite Alliance for Fair & Progressive Employment Practices. (2019). *Tripartite guidelines on fair employment practices*. https://www.tal.sg/tafep/getting-started/fair/tripartite-guidelines

United Nations. (2019a). *World population prospects 2019: Data booklets*. https://population.un.org/wpp/publications/files/wpp2019_databooklet.pdf

United Nations. (2019b). *World population prospects 2019: Highlights*. https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf

Wandner, S. A., Balducchi, D. E., & O'Leary, C. J. (2018). Public employment policy for an aging workforce. *Gerontology and Geriatric Medicine*, *4*. https://doi.org/10.1177/2333721418800064

Yoon, J. (2015). Labor market outcomes for women in East Asia. *Asian Journal of Women's Studies*, *21*(4), 384–408. https://doi.org/10.1080/12259276.2015.1106861

Dismantling Age Myths: Towards a Resilient Multigenerational Manufacturing Sector in Singapore

Thijs Willems and King Wang Poon

Abstract

This paper examines the strategic importance of fostering a multigenerational workforce to enhance the competitiveness of Singapore's manufacturing industry in the face of the Fourth Industrial Revolution. Addressing common myths about age and technological adoption, our mixed-methods study reveals that the integration of the diverse strengths of an age-diverse workforce is not only beneficial but also necessary for innovation and sustainable growth. With Singapore's manufacturing workforce rapidly ageing and fresh talent dwindling, the industry faces challenges like knowledge transfer, automation, and the risk of skills dilution. We argue that a multigenerational approach that combines the expertise of older workers with the digital fluency of the younger generation can create a resilient talent pool essential for continuous expertise and complex problem-solving. The aim of this paper is thus to debunk several myths around an ageing workforce that currently stand in the way of fostering a multigenerational workforce in Singapore's manufacturing industry. We end the paper by arguing that such a workforce will become increasingly important for other industries as well.

Introduction

The concept of cultivating multigenerational workforces is widely accepted as a strategic approach to embrace in the face of industrial transformation. Yet practical implementation remains a challenge, often obstructed by entrenched myths about age and adaptability in the workplace. Our paper delves into these misconceptions, proposing that dismantling these myths is crucial for developing an adaptive and resilient multigenerational workforce in Singapore. Specifically, we explore these myths through a mixed-methods study in Singapore's manufacturing industry. Although the manufacturing industry has unique characteristics, our findings provide a valuable perspective on multigenerational workforce dynamics that may be applicable across various sectors, challenging more general misconceptions about age and technological adaptability.

Singapore's manufacturing industry, like many other industries across the globe, stands at the cusp of the Fourth Industrial Revolution (Brynjolfsson & McAfee, 2014; Susskind, 2020). It faces a complex mix of opportunities and challenges, with innovative and sustainable solutions as the key requirement for further growth amidst issues such as global crises and an ageing workforce. The Singapore government is committed to developing the manufacturing sector. As part of the Singapore Economy 2030 plan, it outlined an ambitious 10-year plan to increase the manufacturing value-add by 50% by 2030 and maintain its share of about 20% of gross domestic product (Ng, 2021). The Manufacturing 2030 plan outlined by the government is a clear signal of its desire to maintain manufacturing as one of the key drivers for Singapore's future economy.

However, a significant demographic challenge looms over the industry: a rapidly ageing workforce. With the average manufacturing worker in Singapore now in their 50s (Singapore Department of Statistics, 2022), a critical transfer of knowledge and expertise is at risk as this cohort approaches retirement. Concurrently, the industry struggles to attract fresh talent, with a marked decrease in the number of young people interested in manufacturing careers.

This generational gap is further complicated by the push towards automation. While automation offers increased efficiency, it also introduces challenges such as the "deskilling" of workers (Braverman, 1974) and the creation of expertise gaps. These changes demand a workforce that is not only technically adept but also capable of complex problem-solving when automated systems falter. This "irony of automation" (Bainbridge, 1983) entails that the more systems are automated, the more crucial human expertise becomes to manage situations in which such systems fail (Willems & Hafermalz, 2021). For manufacturing, the consequences of system failure can mean loss of life or large sums of money. The risk of such skills dilution, because of these reasons, is thus an acute issue for manufacturing in Singapore.

In response to these challenges, this paper proposes the cultivation of a multigenerational workforce as a strategic imperative. Doing so requires the dismantling of some persistent myths around older workers. By integrating the expertise of the current ageing workforce with the technological fluency of younger generations, we can forge a talent pool that is innovative and resilient. At the core of this is the principle of active participation and reflection, or what is more commonly referred to as a form of situated workplace learning (Lave & Wenger, 1991; Schön, 2017; Wenger, 1999). This approach emphasises the contextual nature of learning, where knowledge is shared and expertise is developed through the daily interactions and problem-solving activities of people of different generations in the course of their work.

One strategy we thus wish to explore in this paper is that of actively fostering and leveraging the benefits of a "multigenerational workforce," as this may mitigate or at least soften the consequences of a skills dilution. Our research suggests there is significant untapped potential in Singapore's existing multigenerational workforce. By dispelling myths and leveraging the full range of generational strengths, we can maximise the benefits of this diversity. Bringing together the wisdom of experienced professionals and the tech-savviness of younger generations can create a dynamic and versatile talent pool where people of different age groups and with different types of expertise can effectively learn from one another. This fusion not only propels current manufacturing capabilities forward but can lay a robust foundation for continuous innovation, ensuring the industry's resilience in the face of global trends now and in the future.

The idea of a multigenerational workforce is not new. It has been proposed that it is one of the key factors transforming contemporary workplaces across the globe (Born & Drori, 2015). It has also introduced specific opportunities such as an impetus for new innovation (Raghunath, 2021) and implications for workers' engagement (Kaifi et al., 2012), as well as created new challenges to be managed such as bridging generational divides in human resource policies (Smith & Garriety, 2020) and addressing issues associated with different generations having different affinities with technologies that are changing the workplace (McMullin et al., 2007). For this paper, however, we are particularly interested in putting forward the view that an integrated multigenerational workforce can be a catalyst for development through reciprocal learning. This model not only sustains expertise across generational divides but also harnesses distinct generational strengths to forge a more resilient manufacturing workforce. We show how this may create a more secure and consistent pool of stocks that helps the industry navigate future ups and downs. This, we argue, should be a key consideration for organisations as well as policymakers when developing workforce plans to tackle the challenges associated with the future of work.

This paper thus seeks to delve into the multifaceted benefits and the strategies for cultivating a multigenerational workforce within Singapore's manufacturing sector. Focusing on the potential of blending diverse generational skills and experiences, we aim to argue how such a workforce can define Singapore's manufacturing industry's competitive edge. As the industry grapples with the fast pace of technological change, the cross-generational exchange of knowledge and skills becomes not just beneficial but also essential for maintaining and fostering an environment where innovation thrives. This exploration is aimed not only at understanding the inherent value of an age-diverse workforce but also at providing actionable insights into how it can be effectively implemented to ensure the sector's advancement.

To explore this, we conducted a mixed-methods study in Singapore's manufacturing industry. As part of a larger study on the future of work, we wanted to capture the voices of manufacturing workers as an empowering counter-reaction to the dominating voices of consultancy and technology firms, which often tout technology as the sole solution and workers as the ones who need to adapt (Schlogl et al., 2021). We conducted a total of 71 interviews with workers from all age groups, as well as two surveys (one with 300 manufacturing workers and another one with 1,300 workers from all industries). The findings highlight the significant benefits of a workforce spanning generations, and show how diverse perspectives and skillsets can contribute to innovation and productivity. Based on these, we map out some strategies that Singapore's manufacturing industry can consider.

In detailing our findings, we confront and dispel three myths that have obscured the contributions of a multigenerational workforce. We begin by overturning the misconception that digital prowess is the sole catalyst of innovation. Our research reveals a more nuanced reality where innovation is fuelled by a blend of digital literacy and the seasoned domain expertise of older workers, proving that adaptability and depth of knowledge are equally critical.

Moving beyond the narrow view of technology adoption, we spotlight the often-overlooked role of experienced workers in integrating new tech with existing practices. Contrary to the myth of their aversion to technological change, we find that older workers are instrumental in driving innovation, leveraging their extensive industry knowledge to ensure that technological advancements are both relevant and effectively applied. Lastly, we challenge the outdated belief in unidirectional learning, where knowledge is perceived to flow from one generation to another in a single direction. Our findings illustrate a vibrant landscape of learning, characterised by mutual exchange and collaboration across age groups, fostering an environment where shared knowledge enhances the collective expertise of the workforce. These insights illuminate the fallacies in common stereotypes while highlighting the intrinsic strengths of a workforce that spans generations, advocating for strategic efforts to harness the full spectrum of skills and experiences within Singapore's manufacturing industry.

Below, we start by briefly explaining the methods employed in this study. We then draw on our data more broadly to explore the development of Singapore's manufacturing landscape in order to identify several continuities that define the industry as well as highlight some discontinuities of challenges particular to the current era. We do so to set the stage for a deep

dive into our findings on how a multigenerational workforce may address these (dis)continuities. Finally, we discuss our findings and explore several pathways for how a multigenerational workforce can be effectively encouraged through organisational and national policies.

Methods

This paper builds on a mixed-methods study conducted between 2020 and 2023 to understand the shifting landscape of Singapore's manufacturing industry, specifically in terms of technological transformations and their impact on workforce development. In total, we conducted 71 interviews with manufacturing workers from different age groups (from interns to those already retired) and different functional groups (from technicians to managers and directors). These qualitative instruments were designed to elicit deep insights into the lived experiences of workers, their perceptions of the sector's evolution, and their visions for its future. The main findings of this study are reported elsewhere (Poon et al., 2023; SkillsFuture Singapore, 2021), but for the purpose of this paper we zoom in on one of the key findings of the overall study: the potential of a multigenerational workforce. To understand this phenomenon better, the researchers conducted two additional surveys to target a larger population that strengthens the qualitative findings and to potentially make these more generalisable.

Survey 1

The questions for the first survey were designed with the qualitative data in mind, zooming in on manufacturing workers' experiences and outlook of their industry, as well as on their perceived levels of skills and competencies. 300 workers participated in this study, aged between 19 and 73 years old (median age = 34), with 136 male and 164 female respondents. There was no statistically significant difference in the survey results based on gender. We recruited workers of various roles and from different departments, including engineers, technicians, accounting, and administration. The survey was structured along three sections: workers' experience and outlook; assessing their competencies, both digital and nondigital; and what workers considered helpful for their future in the industry. The data of this survey as well as our qualitative findings prompted us to design a second survey specifically looking at the "attractiveness" of different industries as perceived by Singaporean workers (i.e., their willingness to join different industries).

Survey 2

For the second survey, we recruited 1,300 respondents from different industries. Of the respondents, 300 were from the Manufacturing sector, 200 were from the Financial Services & Insurance sector, 200 were from the Computer & Technology sector, and the rest were from various other sectors. The median age of those surveyed was 30 years old. Of the survey respondents, 600 were male and 700 were female. Workers of various roles and departments were recruited for this survey, including engineers, technicians, accounting, and administration. For this survey we asked the respondents questions around the following themes: their willingness and confidence to switch to a different industry, a ranking of the attractiveness of different industries, the reasons for wanting to change industries, and the barriers preventing them from doing so.

For both surveys we used an external vendor to recruit participants. After data collection, we received the raw data on which descriptive analysis was carried out. Correlation analysis was also run between the different questions and the demographic factors, such as income, age, and work experience. Interviews were thematically analysed using NVivo and following the basic principles of grounded theory (Gioia et al., 2012).

Given our large dataset and our broader questions for the larger research project, we present in this paper our data somewhat selectively by primarily focusing on the idea of a multigenerational workforce. Since our qualitative study as well as our two surveys covered a good range of workers' ages, this is warranted. Moreover, the overall study clearly indicated the multigenerational workforce as one of the main insights generated through the study (see

SkillsFuture Singapore, 2021). For the purpose of this paper, we used 40 years as the cut-off age for older and younger workers, because one of the project objectives was to understand the impact of technology on mid-career workers and beyond. Moreover, from our discussions with government agencies, they too consider people aged 40 years and above as older workers.

Findings

In this section, we address and debunk three critical myths that underscore the evolving nature of innovation and learning in the manufacturing sector. We begin with the myth that innovation is solely propelled by digital competencies, highlighting instead the fusion of these modern skills with the rich domain knowledge of established workers as the true catalyst of progress. Far from being rigid, these professionals demonstrate remarkable adaptability built up over the years, and they can utilise this experience to guide technological advancements within the industry. Next, we dispel the misconception of older workers' aversion to technology adoption, illustrating instead their instrumental role in harmonising new tech with existing operations to propel innovation that is not just technology focused, but can also be meaningfully incorporated into the industry. Lastly, we overturn the myth of unidirectional learning—often seen as flowing from old to young or from young to old (through reverse mentorship). Our findings illustrate the reality and importance of a multidirectional learning culture, where knowledge transfer is a reciprocal process across all ages. Debunking these myths clarifies some of the misconceptions around a multigenerational workforce, while reinforcing the importance of each generation's role. This makes a compelling case for the deliberate nurturing of a multigenerational workforce as a strategic asset for Singapore's manufacturing industry.

Myth 1: Digital Skills Alone Drive Innovation, and Since Older Workers Are Reluctant to Change, This Hampers Industrial Transformation

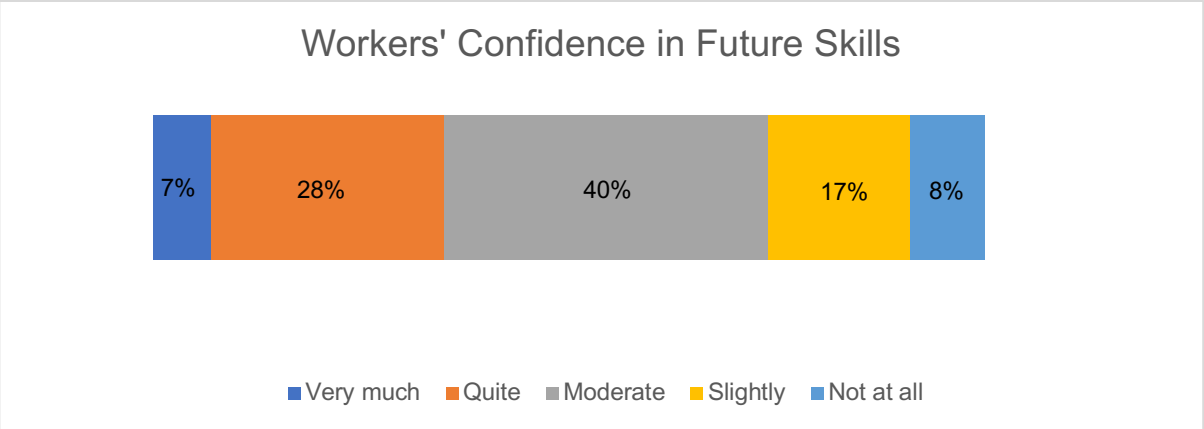
The prevailing narrative often singles out digital skills as the sole driver of innovation in the manufacturing sector. Doing so tends to cast older workers as being less adaptable to such technological shifts. However, our findings present a different picture. In the words of one older engineer:

> We started our apprenticeship in the 70s you see, during that time it was very manual ... Yah we were very worried when we went into computerised training. We are very worried that we would press the wrong button because when you press the wrong button the machine will crash ... But if you think that oh my manual skill is very good, it's good enough I won't need to learn computerised processes but as years go by, your skill becomes obsolete. So it's better, it's not whether you like it or not. You have to know that as the industry progresses you have to follow. When this is the direction of the trend you have to follow.

In Survey 1, a substantial 75% of respondents from Singapore's manufacturing industry expressed at least moderate confidence in their skills for the next 2–3 years (see Figure 1), with only 25% responding that they believe they do not or only slightly have the skills necessary to navigate changes in the years to come. We did not find any difference here between older and younger workers. This confidence for the future defies the myth that older workers are set in their ways or that digital skills are the exclusive catalysts of innovation.

Figure 1

Manufacturing Workers Feel That They Have Most of the Skills Needed for the Next 2–3 Years in the Industry

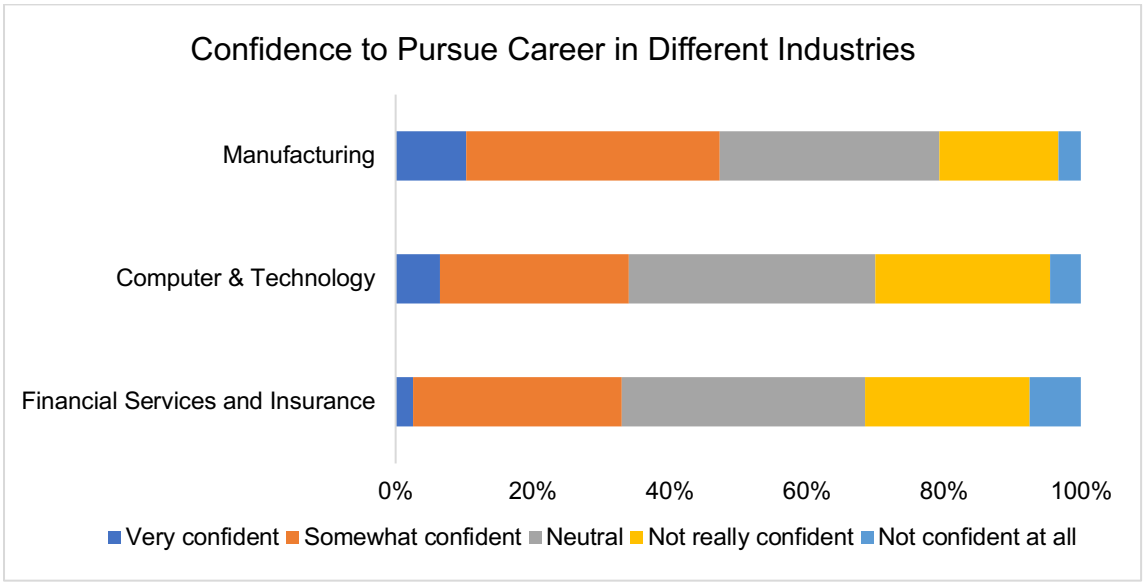


Reality: Innovation Flourishes at the Intersection of Digital and Domain Expertise, Bolstered by the Adaptability of Seasoned Workers

In Survey 2 we specifically asked how confident workers are that the skills they have are transferable to other industries if they were to pursue a career elsewhere. Manufacturing workers rated themselves the highest, compared to other groups of workers, in their ability to move to other sectors, with 47% saying that they were confident in doing so (Figure 2).

Figure 2

Confidence of Workers in the Computer & Technology, Financial Services & Insurance, and Manufacturing Sectors to Pursue Careers in Other Industries



This can at least partially be explained by what some respondents see as "generic engineering skills" that are not specific to any of the manufacturing subsectors (e.g., chemicals, electronics, biomedical, etc.) but apply to the entire domain. In the words of an engineer in the additive manufacturing sector:

> What I see in our department is that a lot of the engineering skills are easily transferable. So there are some things, like industry knowledge, that you need to pick up if you were to change to a different company. If I moved to, like an energy generation company, I

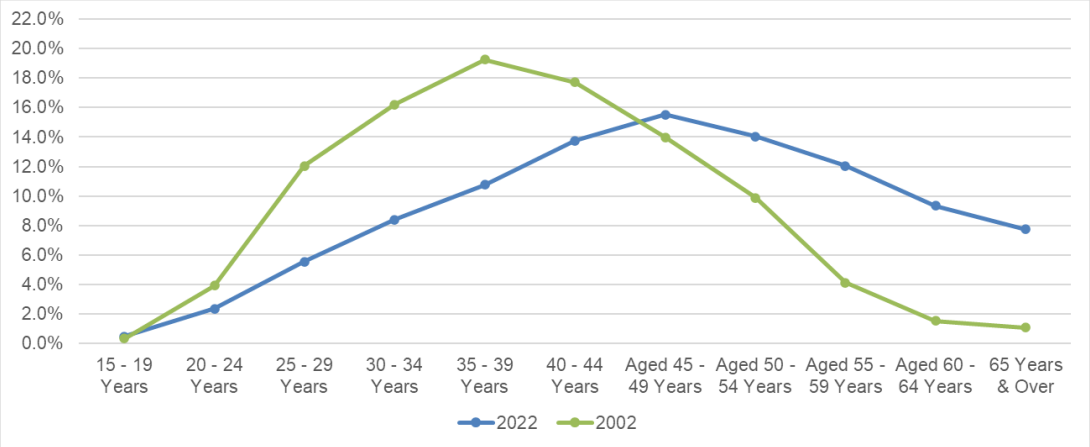
> think a lot of the soft skills, like analysis, or critical thinking, things like that would be very helpful. I would need to pick up on things like the energy generation technology. But I think generally, if you're working in that company day to day, this process happens like really quickly. Yeah. And I still have colleagues that do a bit of like programming. I'm sure this is easily transferable to maybe like electronics or software.

This confidence suggests that the manufacturing workforce is already adaptable and versatile and thus relatively resilient amidst industry changes or technological and global transformations.

However, these findings need to be interpreted critically. As seen in Figure 3, the average age of the manufacturing workforce has increased in the past decennial. This is a result of a population that is ageing in general, but the effects are especially visible in this industry because fewer and fewer young people want to join manufacturing. The confidence and resilience as discussed above needs to take this into account. Older workers, forming the majority of the manufacturing workforce, have gone through many boom-and-bust cycles that have strengthened their adaptability. This is not necessarily the case for younger workers or fresh graduates entering the industry. Moreover, this is compounded by the fact that uncertainty in the industry is worsening due to current energy and commodity risks, geopolitical shifts, and a general reconfiguration of the supply chain.

Figure 3

Percentages of Workers by Age Group in the Manufacturing Sector, in 2022 and 2002



Note. From "Percentage by Age Group in Manufacturing Sector 2020–2021," by Singapore Department of Statistics, 2022.

The success of Singapore's manufacturing industry thus increasingly hinges on a population that is poised to leave the industry in the next decade or so. A multigenerational workforce with the right strategies may be able to counter this. At the core of this demographic mix is the potential for significant knowledge transfer—a process that is essential for guiding younger professionals through the complex landscape of contemporary manufacturing. Seasoned workers, bearing the acumen from past cycles of boom and bust, are in a unique position to impart strategies for navigating the industry's inherent uncertainties. Through structured mentorship programmes, this wisdom can be systematically disseminated, equipping the new wave of workers with the tools to thrive in an ever-changing environment. This also becomes increasingly important in the context of troubleshooting as manufacturing usually implies a complex system that needs to be understood in its entirety. One precision engineer captured this as follows:

> But they [younger generation] don't know where these tools come from. In case anything goes wrong with the tool, they actually don't know how to do a lot of the troubleshooting. But for us, because we know how the tool was being made, the geometry that affects the machining, this and that, so when things go wrong…we have the knowledge to

> understand that. So, when it comes to some of the troubleshooting we're doing ourselves, it becomes handy to do. We have this additional knowledge compared to today.

However, the efficacy of these programmes hinges on the reciprocal nature of knowledge exchange. While the depth of industry-specific knowledge from experienced workers is indispensable, the infusion of new skills, particularly in digital technologies, from the younger generation is equally critical. This bidirectional mentorship model is not without its challenges. It demands a level of openness and adaptability on both sides, with each generation willing to assume the roles of both teacher and student. These are prerequisites for an industry aiming to stay in tune with technological advancements while maintaining a grip on its foundational practices.

Bridging diverse disciplines within the industry also remains a pivotal concern. The need to develop a workforce that is not only technically proficient but also possesses the versatility to work across various domains is more pressing than ever. A delicate balance must be struck in cultivating a workforce that can move fluidly between specialised tasks and broader strategic or emerging roles. The aim is to avoid the pitfalls of a siloed skillset, fostering instead a labour pool that is comprehensive in its competencies. Despite the optimistic outlook illustrated by our data, the underlying challenges must be navigated. The future of the industry may well depend on how effectively it can blend the robust experience of its longstanding workers with the innovative approaches of those entering the industry.

Myth 2: Older Workers Are Less Receptive of New Technology

The Singapore government's commitment to the sector, as outlined in the ambitious Singapore Economy 2030 plan, aims to increase the manufacturing value-add by 50% by 2030. This strategic vision not only reinforces the sector's pivotal role in the economy but also highlights the government's push towards adopting Industry 4.0 applications, drawing more global and local companies to pursue advanced manufacturing techniques in Singapore. Such initiatives are indicative of a clear desire to intertwine digital advancements with existing domain expertise, creating a fertile ground for innovation. There is a pervasive myth that older workers are less receptive to new technology, often casting a shadow over their contributions to the workplace. In one of our initial interviews, an engineer repeated this popular myth:

> Because they're so used to the way it's been run … Nobody wants to do anything. Because they're so comfortable with whatever they have. That's the first reason. Because they've been there for 10-15 years. They've been doing it day in day out, like what earlier I mentioned, the cow path, so comfortable moving. Suddenly you ask them to change direction, they're lost. They say, sure or not? This one high risk low volume, maybe doesn't work. This one, whoa. They will give you a lot of reasons why you should not be doing that. Because they're not in their comfort zone.

The quote suggests rigidity and reluctance to adapt to the evolving technological landscape, framing older workers as potential obstacles to progress. This stereotype, not just in this interview quote but also in popular discourses both locally and abroad, paints a picture of a demographic resistant to learning and integrating new digital tools, which appears to be at odds with the dynamic and fast-paced nature of modern industry, particularly in sectors like manufacturing where digital competencies are increasingly valued. However, as we will see, this myth does not hold up when scrutinised against the actual capabilities and attitudes of older workers in the field.

Reality: Older Workers Are Instrumental in Integrating New Technology With Existing Operations That Will Further Drive Innovation

Innovation in manufacturing does not solely pivot on technological adoption but rather on the meaningful integration of these technologies with the foundational domain knowledge possessed by the workforce. This integration is where the value of a multigenerational workforce becomes clear. Older workers, with their deep domain knowledge and understanding of foundational technologies, are as crucial for innovation as the younger, often more tech-savvy

generation. Combining both types of expertise builds a foundation for applying new technologies meaningfully rather than digitalising just for the sake of it. Conversely, younger workers bring a digital proficiency that, when combined with the domain expertise of their older counterparts, helps establish an environment ripe for innovation.

The success of digital innovation rests on the foundational domain knowledge that older workers possess, as described by an engineer in the Robotics sector:

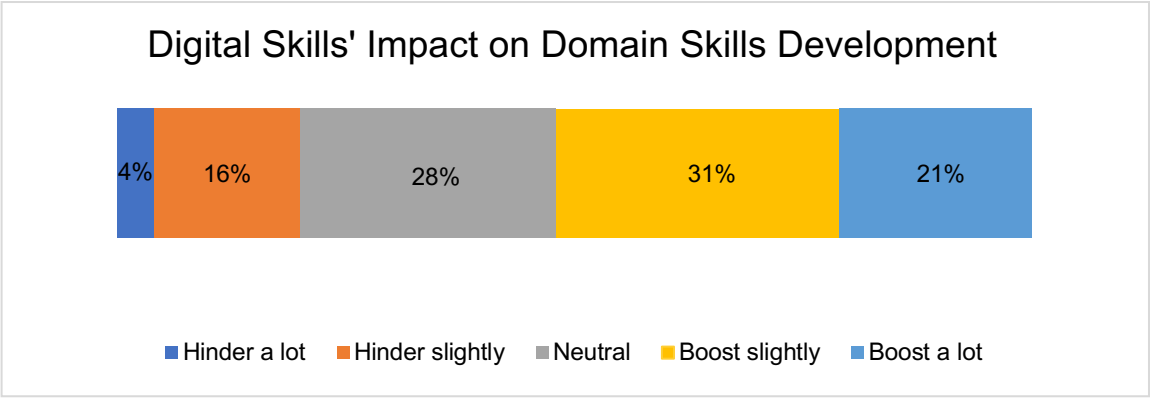
> The foundation of traditional technologies, they make up the foundation of any new cutting-edge technology. So for newer cutting-edge technology to emerge, there has to be some form of foundation. So therefore, this foundation has to be instilled in engineers.

This perspective illustrates that while workers are receptive to furthering their digital skills, there remains a strong focus on domain knowledge, which is seen as the foundation upon which innovation is built. It is a recognition of the synergy between the value of domain skills and the promise of innovation.

Interestingly, when we asked respondents whether they think digital skills will hinder or boost the development of their domain skills, 52% answered that digital skills will boost their existing domain skills (see Figure 4), suggesting that we need to start thinking of digital skills as complementary to domain skills rather than as a replacement of it. Looking more detailed into these responses we found a positive correlation (r=0.137, p<0.05) between respondents' age and how much they think digital skills will boost domain skills: The older the workers are, the more positive they are that digital skills can boost their domain skills. For instance, while 50% of the workers below 40 years old think that digital skills will boost their domain skills "slightly" or "a lot", this percentage was significantly higher at 60% for those workers aged 40 years and above. These perhaps counterintuitive findings suggest that older workers may already have a solid foundation of domain skills, and therefore may have a better idea of where digital technology could be applied in useful ways. Rather than the view that digitalisation "disrupts" processes, these experienced workers may be able to better see where digital technology is relevant in existing workflows and can be used in concert with domain skills for a net gain in productivity. As for the younger workers for whom the digital world is second nature, they might feel that the increasingly digitalised nature of the workplace hinders them from picking up the domain expertise in their industry. With increased emphasis on digital skills and the prevalence of automation, they may feel like they know the procedures but are lacking in the domain knowledge necessary to fully understand the manufacturing process.

Figure 4

Majority of Manufacturing Workers Feel That Digital Skills Boost Domain Skills



Digital proficiency is not just about being conversant with new technologies but about understanding how these technologies can complement and enhance domain-specific knowledge. The positive correlation found between the age of respondents and their view on how digital skills can boost domain skills underscores the potential for multigenerational

collaboration in driving innovation that is both at the cutting-edge of emerging technology and implemented in meaningful ways. There appears to be a genuine fear that digital in the current workplace is being overemphasised at the cost of domain knowledge, with a technician in the Energy & Chemicals sector saying that:

> There is an increasing need for hands-on or "field" experience. There are now many engineers who are only doing data analytics in the office and rarely enter the field anymore. As a result, they can't distinguish between water and acid.

Overemphasising the digital ironically creates risks to workers' employment, something that is well explored in the literature (Bainbridge, 1983): The more processes are being automated, the more fundamental the human contributors or controllers become; yet, the more processes are being automated the less opportunity there is to develop human expertise. This tension between the digital and the domain is not about choosing one over the other but about finding the right balance where digital skills supplement rather than supplant domain expertise. The evidence suggests that manufacturing workers, particularly those seasoned in the field, view domain knowledge as fundamental, a sentiment that is echoed across the sector.

Combining the more traditional and the more emerging digital type of expertise thus seems a way through which the manufacturing industry in Singapore can redefine what innovations entails. Hands-on experience together with the digital competencies of younger workers can ensure that workplaces are not digitalising just for the sake of it but that it actually benefits the practices of workers. A multigenerational workforce arguably provides a more direct path to diversity of thought, which in turn can further increase the adaptability and versatility of the workforce.

Myth 3: Learning Is Unidirectional, and Typically Happens From Older to Younger Workers or Vice Versa

The prevalent belief that knowledge transfer within the manufacturing sector follows a one-way street, from the old to the young or through reverse mentoring, is a myth that our findings challenge. The notion undervalues the rich, reciprocal exchange of skills and experiences that occurs in a multigenerational setting. Our findings suggest that learning is indeed multidirectional: Veteran workers possess invaluable hands-on expertise and critical thinking honed through years of navigating the industry's ebbs and flows, while younger workers contribute up-to-date technical knowledge and digital fluency. This symbiotic relationship fosters a dynamic learning environment, with each generation enriching the other, facilitating innovation and safeguarding against the erosion of vital industry skills. This also indicates that learning is about much more than upskilling or following formal training programmes. In a multigenerational workforce, informal and on-the-job learning becomes at least as important.

Reality: Learning Is Multidirectional and Collaborative, With All Generations Contributing to and Benefiting From Shared Knowledge

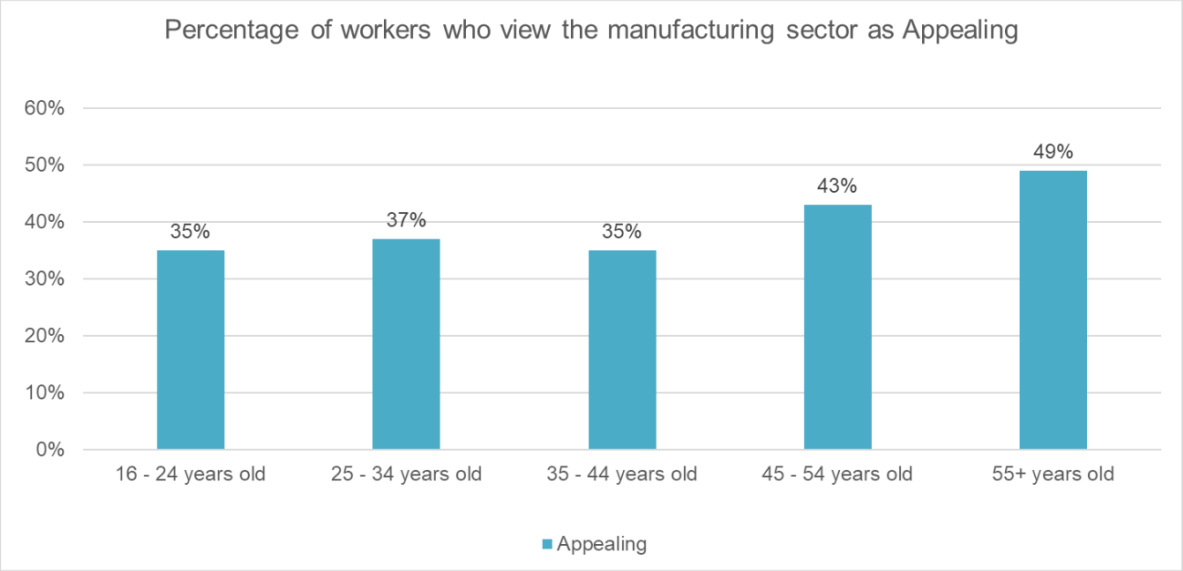
In addition to spurring meaningful innovation and enhancing the adaptability and versatility of Singaporean manufacturing workers, our data also indicates that a multigenerational workforce may be fruitful in stimulating learning across generations. This would not only contribute to lifelong learning strategies, but also ensure that the industry becomes better protected against skills dilution.

The slow disappearance of the more traditional, hands-on knowledge and skills of workers is an immediate risk that should be managed. This includes securing a pipeline of younger technology professionals that want to join the industry. As we have seen earlier, the average age of the manufacturing workforce has been inching up (Figure 3). The extensive experience and substantial stock of skills in the industry are now a strength, but without younger entrants, the experience and stock can diminish even before we have achieved Singapore's manufacturing strategies and ambitions. This risk is acute given how unattractive manufacturing is to younger workers. In our survey we asked workers in other industries to rate how appealing it would be to

join the manufacturing sector. Notably, only 37% of those between 25 to 34 years old found manufacturing to be appealing. This compared to 49% of those aged above 55 years who found it appealing (see Figure 5). This is in addition to the percentage of manufacturing workers who considered pursuing a career in a different industry (57%), a much higher percentage than for example workers in the Computer & Technology sector (30%) or in the Financial Services & Insurance (36%) sector.

Figure 5

Appeal of Working in the Manufacturing Sector, Breakdown by Age Group



This thus presents a triple whammy of risks that must be strategically managed: a relatively large proportion of workers leaving the industry naturally in the next decade or two (e.g., due to retirement), fewer people joining the industry, and a large proportion of workers who are considering switching industries—something that may become prevalent if the sector goes through another downturn or crisis. This is of course a complex issue requiring a diverse set of measures. But we would like to explore here how cultivating a multigenerational workforce can mitigate the issue of skills dilution.

Enhancing lifelong learning and protecting Singapore's manufacturing skills are crucial, especially when considering the multifaceted risks posed by an ageing workforce, the dwindling interest from youth, and the temptation for skilled workers to migrate to other industries. Our research underscores the importance of cultivating a multigenerational workforce, where the transfer of tacit knowledge and the blending of old and new skills can create a robust learning environment that benefits all. An especially effective practice here would be to leverage early placements of interns or entrants to the industry to pick up important "field experience" but also to encounter and manage operational disturbances at an early stage. As an industry expert in the oil and gas industry highlights, this is not only one of the more crucial skills to develop in terms of safety but also an area where domain and digital skills can form the basis for further innovation and learning:

> Let's give a very simple example within the O&G industry: Suddenly you feel that there is a low flow alarm that is coming from an unexpected valve closing, or pump failing, or leakage. The important point is that from the older generation, probably they will know that, there are 2 kinds of skills that is necessary—the recognition skills—to select the right information that is presented and form a mental model at hand, and 2nd, the connective skill to forecast what is going to happen next and access whether you have time to implement something. This is coming from the older people. For the younger people, when they look at this, they have some images in terms of how these things can be implemented, how these things can be enabled using Industry 4.0 initiative. So you

> actually put them together. And whether this is reverse mentoring or reverse coaching, or the traditional mastery in terms of mentorship, it does work.

This approach to learning would provide an opportunity for companies to rethink workplace learning and to encourage multidirectional mentorship. Where traditional mentorship has been unidirectional (from senior to junior), multidirectional mentorships (Yang et al., 2023) can benefit both young and old workers. While senior workers can pass on their embodied knowledge and deep experience to juniors, juniors who tend to be more familiar with the digital aspects of work (because they acquired their technical skills in a digitalised setting) can provide new perspectives and accelerate digital transformations in the workplace. This cross-learning can aid in improving domain-digital literacy for all workers in the workplace.

Perhaps one of the more pertinent issues here is that organisations must create a culture that fosters multigenerational mentorships and interactions. This requires a rethink on who or what the expert is in a given field, as indicated by an engineer:

> I feel like it's something that is necessary. Having these fresh graduates in the company, injecting this new talent into the company, but also working alongside seniors … That actually brings a nice synchronicity of the different talents, but also fresh perspectives on a set of things ... I feel that the company can move together. Between the young and old. Because I don't think that the fresh graduates, when they come in, they get a certain amount of intimidation from the seniors. We don't feel that. Because we actually feel that everyone has a place, a part to play to actually drive the solutions into place.

Such a culture is thus about breaking down traditional hierarchical barriers in acknowledging that nobody's expertise is superior but that innovation in the industry requires diversity of thought and a wide variety of approaches. And this is most likely to happen on the job and through informal learning practices. More concretely, this can also be manufactured by a particular design of the workplace. We take inspiration here, for example, from ergonomics-focussed factories such as the Porsche-Leipzig factory. This facilitates two things at once: It allows older workers to continue their occupation in good health for a longer duration, and it also signifies to younger workers that the industry is becoming a more attractive one to work in and that there is a future for them in it. Finally, it provides additional opportunities to capture the knowledge of older workers before they may leave the industry (McGee, 2019).

Discussion and Conclusions

This paper identified and debunked three persistent myths around older workers that have hampered the effective implementation of a multigenerational workforce. Our findings indicate that actively fostering and leveraging the benefits of a multigenerational workforce can be an effective strategy for Singapore to pursue in countering some of the threats the manufacturing industry is facing. Particularly, we have shown how manufacturing workers see this as: a matter of establishing further adaptability and versatility (which could make them more employable in case of downturns), the spurring of more meaningful innovation as it becomes better incorporated into existing processes and practices, the stimulation of learning across generations in ensuring no important skills and knowledge leave the industry when part of the current workforce retires. Contrary to the myth that older workers are less receptive to new technology, our findings emphasise that their engagement is crucial within the workforce where they can merge their seasoned expertise with the technological savviness of younger workers.

These insights align closely with the work of Wenger (1999), where the mutual engagement of a multigenerational workforce forms a community of practice. This community is not just about sharing the same space or occupational territory, but about active participation and finding synergy between the seasoned expert and the tech-savvy professionals entering the industry. This is for example shown in our findings on how digital technological developments can actually provide further depth and sophistication to deep-rooted existing practice. Such learning is most likely of a situated (Lave & Wenger, 1991) and a reflective (Schön, 2017) kind. The apprenticeship model that Lave and Wenger (1991) describe, for example, is not confined to formal educational settings but is primarily situated in and on the manufacturing floor. It is also a

highly reflective practice that requires an interplay between the often tacit understandings of one generation and the more explicit and digitally oriented knowledge of a younger generation. In other words, learning in a multigenerational workforce is inherently a social process, and policy should go beyond merely encouraging interactions between generations, but find ways to institutionalise these to ensure a continuous cycle of learning between people. In refuting the myth of unidirectional learning, we uncover that on-the-job learning is crucial and enriched by multidirectional and collaborative learning, where wisdom and digital literacy are shared between generations.

The future of Singapore's manufacturing industry hinges—amongst many other things—on harmonising such different generations of expertise. The irony of automation (Bainbridge, 1983), and the irony of digital transformation processes for that matter (Willems & Hafermalz, 2021), is that these processes require a blend of generational competencies to manage unexpected situations in nuanced ways. As such, the multigenerational workforce becomes a strategic advantage more than just a demographic reality. Such an advantage should build on the idea that different generations have different technological affinities (McMullin et al., 2007) and that each generation brings their own unique strengths to Singapore's manufacturing landscape. If this can be accomplished, it would paint a different future than the usual future of work predictions about workplace disruptions (e.g., Brynjolfsson & McAfee, 2014; Schlogl et al., 2021; Susskind, 2020). Specifically, it may address the risk of deskilling and the degradation of labour as it was famously described by Braverman (1974) and more generally in labour process theories. Our notion of the risk of skills dilution here is aligned with such deskilling theories except that it takes into account not just technological transformations but also social phenomena opening up new ways to potentially address this. The harmonisation of expertise across generations presents an opportunity for a strategic advantage, challenging the myths of resistance and reluctance, and proving that a multigenerational workforce can navigate the complexities of automation and digital transitions with nuanced expertise.

This research contributes to the literature by providing a nuanced understanding of the Singapore manufacturing sector's workforce dynamics. It ties empirical evidence to the theoretical frameworks established by scholars like Teo and Ang (2001), illustrating how the past (Hwa, 1979; Lee, 1973) and present states of the industry can inform its future trajectory. Moreover, Singapore's proactive governance, as highlighted by Raghunath (2021), must continue to address the skills dilution risk by fostering policies that promote lifelong learning and multigenerational mentorship, as identified in our study. These policies should be crafted to encourage a culture of continuous learning and flexibility, just as Smith and Garriety (2020) highlight the need for bridging generational gaps in the workforce. We specifically feel that the discourse around technology, as well as around the future of work in general (e.g., Schlogl et al., 2021), should more actively involve the voices of workers. Doing so would provide a more nuanced discourse around how existing knowledge, skills, and competencies are not there to be overthrown by a digital revolution but are key to ensuring that digitalisation happens in a meaningful way. Most importantly, the myths we identified in this paper should be actively countered when such policies are designed. Doing so would be an indicator to the current workforce as well as future applicants that the manufacturing industry in Singapore is here to stay, and that there is a future in this industry for human workers in addition to digital tools.

In conclusion, the policy implications of our study are clear. As the Singapore Department of Statistics (2022) reports on workforce demographics, there is a pressing need for strategies that not only attract younger cohorts but also facilitate the transfer of tacit knowledge across generations. Schlogl et al.'s (2021) discussion on the policy discourse of work and Yang et al.'s (2023) practitioner-focussed view on learning opportunities provide a framework for such strategies, which should be aimed at nurturing a workforce equipped for the multifaceted challenges of modern manufacturing. Addressing the above, our study's policy implications are clear: To counter the myths and shape a competitive edge, strategies must be formulated to attract younger talent and foster a multigenerational workforce where tacit domain knowledge is a precondition for—and not an obstruction to—the future of manufacturing.

BIOGRAPHIES

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Thijs Willems is a Research Fellow at the Lee Kuan Yew Centre for Innovative Cities at the Singapore University of Technology and Design (SUTD). He conducts ethnographic research on the Future of Work, focussing on the impact of technology on work practices, interactions, and the transformation of the workplace. His work highlights strategies for sustainable digitalisation efforts that puts human expertise at the centre in an era marked by automation. Through ethnographic fieldwork, Thijs explores how workers navigate and adapt to new roles and tasks, contributing novel perspectives to the discourse on the future of work.

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REFERENCES

Bainbridge, L. (1983). Ironies of automation. In *Analysis, design and evaluation of man–machine systems* (pp. 129–135). Pergamon Press.

Born, N., & Drori, E. (2015). *What factors will transform the contemporary work environment and characterize the future of work?* ILR School, Cornell University. http://digitalcommons.ilr.cornell.edu/student/78

Braverman, H. (1974) *Labor and monopoly capital: The degradation of work in the twentieth century*. Monthly Review Press.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W.W. Norton & Company.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, *16*(1), 15–31. https://doi.org/10.1177/1094428112452151

Hwa, C. S. (1979). Economic change in Singapore, 1945-1977. *Southeast Asian Journal of Social Science*, *7*(1/2), 81–113. https://www.jstor.org/stable/24490038

Kaifi, B. A., Nafei, W. A., Khanfar, N. M., & Kaifi, M. M. (2012). A multi-generational workforce: Managing and understanding millennials. *International Journal of Business and Management*, *7*(24), 88–93. https://doi.org/10.5539/ijbm.v7n24p88

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815355

Lee, S. Y. (1973). Some basic problems of industrialization in Singapore. *The Journal of Developing Areas*, *7*(2), 185–216. https://www.jstor.org/stable/4189998

McGee, P. (2019, January 17). Germany invests to prolong employees' working lives. *Financial Times*. https://www.ft.com/content/f1b294b8-9cbe-11e8-88de-49c908b1f264

McMullin, J. A., Comeau, T. D., & Jovic, E. (2007). Generational affinities and discourses of difference: A case study of highly skilled information technology workers. *The British Journal of Sociology*, *58*(2), 297–316. https://doi.org/10.1111/j.1468-4446.2007.00152.x

Ng, C. (2021, January 25). 10-year plan for Singapore manufacturing to grow 50% by 2030: Chan Chun Sing. *The Straits Times*. https://www.straitstimes.com/business/economy/10-year-plan-for-singapore-manufacturing-to-grow-50-by-2030-chan-chun-sing

Poon, K. W., Willems, T., & Liu, W. S. Y. (2023). The future of expertise: From stepwise domain upskilling to multifaceted mastery. In Lee, W. O., Brown, P., Goodwin, A. L., Green, A. (Eds.), *International Handbook on Education Development in Asia-Pacific* (pp. 1–19). Springer, Singapore. https://doi.org/10.1007/978-981-16-2327-1_42-1

Raghunath, N. (2021). *Shaping the futures of work: Proactive governance and millennials*. McGill-Queen's University Press.

Schlogl, L., Weiss, E., & Prainsack, B. (2021). Constructing the 'Future of Work': An analysis of the policy discourse. *New Technology, Work and Employment*, *36*(3), 307–326. https://doi.org/10.1111/ntwe.12202

Schön, D. A. (2017). *The reflective practitioner: How professionals think in action*. Routledge.

Singapore Department of Statistics. (2022). *Percentage by age group in manufacturing sector 2020–2021*. https://www.singstat.gov.sg/

SkillsFuture Singapore. (2021). *Mastery in the digital age: Reconceptualizing expertise, developing deep technical mastery, and accelerating effective workplace learning*.

Smith, J., & Garriety, S. (2020). The art of flexibility: Bridging five generations in the workforce. *Strategic HR Review*, *19*(3), 107–110. https://doi.org/10.1108/SHR-01-2020-0005

Susskind, D. (2020). *A world without work: Technology, automation and how we should respond*. Penguin Books UK.

Teo, T. S., & Ang, J. S. (2001). Singapore's manufacturing sector as engine for economic growth: Past, present and future. *Science and Public Policy*, *28*(5), 361–370. https://doi.org/10.3152/147154301781781309

Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press. https://doi.org/10.1017/CBO9780511803932

Willems, T., & Hafermalz, E. (2021). Distributed seeing: Algorithms and the reconfiguration of the workplace, a case of 'automated' trading. *Information and Organization*, *31*(4), Article 100376. https://doi.org/10.1016/j.infoandorg.2021.100376

Yang, S., Seah, Z., & Chow, R. (2023). Fostering learning opportunities for workers: Looking through the lens of a practitioner. *Singapore Labour Journal*, *2*(1), 96–106. https://doi.org/10.1142/S2811031523000190

Future-Oriented Learning in Workplaces and Company Training Committees

Helen Bound

Abstract

The world of work is dynamic and emergent, demanding different approaches to learning in, through, and for work. The main focus of this paper is to address the question of how we can think differently about learning in the workplace and supporting learning. Supporting learning is a pedagogical act in its broadest sense. Given the landscape of dynamic change in which individuals and firms work, pedagogies and ways of thinking about pedagogy need to be future-oriented. We need to develop people and firms that are able to thrive in constantly changing circumstances, to be able to work with emergence. In this paper, I put forward a framework for Future-Oriented Pedagogies based on mixed methods research work completed at the end of 2023, at the Institute for Adult Learning. Specifically, I consider how the National Trades Union Congress Company Training Committees could use the Future-Oriented Pedagogies framework to ensure the quality of offerings for formal learning in workplaces and how the Future-Oriented Pedagogies framework can be used to enhance a culture of learning that goes beyond formal arrangements for learning (training, undertaking online courses or sessions, and on-the-job training).

Introduction

Learning in workplaces is often equated with training where employees are sent off-site, undertaking online courses or sessions and on-the-job training. While all of these are important aspects of learning in, through, and for work, training, preordained online learning, and on-the-job training are just part of the rich possibilities of learning through work. Why people and organisations need to learn goes beyond the capabilities required for any particular job and the need for a competent workforce. The contexts in which people work are dynamic and emergent, as they must be, to meet constantly evolving circumstances. Rapid advances in technology, particularly the use of Artificial Intelligence, present possibilities and risks that are constantly emerging. Product life cycles, production cycles, and production and business concepts are becoming shorter. Global threats and risks such as international conflicts, climate change, and pandemics all impact on market relations, possibilities, and risks, further contributing to challenges for organisations and workers/learners. The emergence of as-yet-unknown solutions, ideas, ways of working, and how we relate to others and things demands different approaches to how we think about learning at, through, and for work (Engeström & Sannino, 2010).

Such demands are not just the province of professionals and technicians. Production line workers, for example, need to master variation as product life cycles and process optimisation demand change, breaks, disturbances in quality, and waste issues. Such challenges need individuals and collectives—all those involved up and down the production line and management—to be comfortable with what is emerging, and to go beyond what is already known. Working across boundaries of organisational divisions, teams, disciplines, projects, cultures, and working environments is the new norm; a norm that needs boundary-crossing capabilities (Bound, 2024).

The main focus of this paper is to address the question of how we can think differently about learning in the workplace and supporting learning. Supporting learning is a pedagogical act in its broadest sense. Be it peers, a mentor, a buddy, a supervisor, those conducting courses, or anyone in a workplace assigned to support people's learning, all make decisions (often based on their beliefs and learning experiences), consciously and unconsciously, about what learning is, and thus how to support/teach learners and learning. The opportunities for support and how that support is enacted are dependent on the purpose(s) of the learning, power relations, design of the work, as well as the cultures and structures of the work settings, in addition to the dispositions of those involved. The question is: How can we bring all this complexity together to support those who support learning? These are people who knowingly, or not, make pedagogical decisions. Those who make pedagogical decisions need to understand the context, work, and pedagogy. Given the landscape of dynamic change in which individuals and firms work, pedagogies and ways of thinking about pedagogy need to be future-oriented. We need to develop people and firms that are able to thrive in constantly changing circumstances, to be able to work with emergence.

In this paper, I will put forward a framework for Future-Oriented Pedagogies (FOP) based on a mixed methods study completed at the end of 2023, at the Institute for Adult Learning (Bound et al., 2024). In this paper, I also consider how Singapore's National Trades Union Congress (NTUC) Company Training Committees (CTCs) could use the FOP framework to ensure the quality of offerings for formal learning in workplaces, and how the FOP framework can be used to enhance a culture of learning that goes beyond formal arrangements for learning (training, undertaking online courses or sessions, and on-the-job training).

I begin by briefly discussing learning at, through, and for work. This is followed by examining some common assumptions about learning (and teaching), and the possibilities for NTUC CTCs to use the FOP framework. Then, I present the FOP framework. Subsequently, I consider some wider possibilities for these training committees.

Learning In and Through Work

It is useful to begin this section with a definition of what I am referring to when discussing learning at, through, and for work. Evans (2015) offered a useful definition which she used for work-based learning: "Learning at work, for work and through work that expands human capacities through purposeful activity where the purposes derive from the contexts of employment" (p. 18). Expanding human capacities and purposeful activity are highlighted. Another definition emphasises being and becoming through increased capability to act differently, resulting in new relations between people and things in a range of contexts:

> We consider learning to be a process contributing to an increased capability to act differently in the environment … leading to new sets of relations … in different contexts. Through the processes of developing capabilities, acting differently and creating new sets of relations in an environment … workers undertake journeys of being and becoming. (Bound et al., 2019, p. 89)

Both these definitions bring a focus to the contexts of learning and learning environments and highlight a relational understanding of learning. Context is inclusive of societal, cultural, historical, economic, political, and situational factors; it is entwined in everyday practices (Bound, 2015; Evans et al., 2011). Context creates or limits affordances for learning, thus it is important, to *know*, whether your workplace/work setting offers expansive opportunities for learning and/or whether the environments are restrictive of learning opportunities and support for learning (Fuller & Unwin, 2004).

It is often assumed that it is individuals who are solely responsible for learning. While individuals exercise choice over the extent to which they engage in learning, mediated by their background, education, learning experiences, and aspirations, that choice is also mediated by a range of contextual factors. Fuller and Unwin (2004), for example, noted that all too often it is assumed, but not the reality, that there is a causal relationship between individual learning and improvements in organisational performance.

There is a dynamic interplay between individual workers' multisensory experiences of and in their situated environments and their active engagement in purposeful activity (Billett, 2015; Evans, 2015). As individual workers interact with people and things, higher orders of cognition are stimulated (depending on the tasks). The extent of such stimulation is mediated by past personal experiences. Past experiences will fill in gaps (or not), "working to close uncertainties, inconsistencies and lack of viability in what is experienced" (Billett, 2015, p. 67). The relationship between individual learning and organisational learning is complex. Beyond the learning process described by Billett, and the culture and structure of work settings, Fuller and Unwin (2004) argued that business strategies also mediate opportunities for learning: "[T]here is strong evidence to suggest that management decisions about competitiveness and product market strategies provide a framework within which choices about how work is organised and people are managed are taken" (Bosworth et al., 2001; Metcalf et al., 1994; as cited in Fuller & Unwin, 2004, p. 126). "According to this argument, the distribution of opportunities for informal and formal learning across the workforce flows from the resolution of these prior issues" (Coleman & Keep, 2001, as cited in Fuller & Unwin, 2004, p. 126).

In rethinking learning in, through, and for work, it is helpful to consider the business literature on dynamic capabilities of organisations (Bessant et al., 2012; Giniuniene & Jurksiene, 2015; Teece et al., 1997) as it focusses on the firm as learning collectively. The unit of analysis is the firm, not individuals. Literature on workplace learning has typically considered individuals and the culture and structure of workplaces. Dynamic capabilities recognise that collective interaction, exchange, sharing, knowledge building, and collective sense of agency are what build the dynamic capabilities of a firm, enabling it to thrive in changing circumstances.

Teece et al. (1997), the seminal authors of the concept of a firm's dynamic capabilities, noted that "traditional elements of business success—maintaining incentive alignment, owning tangible assets, controlling costs, maintaining quality, 'optimizing inventories'—are necessary but they are unlikely to be sufficient for sustained enterprise performance" (p. 1320). They defined dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516).

Not surprisingly, for a firm to develop dynamic capabilities, learning is considered as critically important (Bessant et al., 2012; Giniuniene & Jurksiene, 2015; Teece et al., 1997). Existing literature notes that how firms use the resources of leadership, learning culture, technology for business and learning, market intelligence, partnerships, and pedagogy is what enables them to be dynamic and agile. Notable in this list of resources is the inclusion of pedagogy and learning culture (Bound et al., 2024).

Pedagogy and Learning

As this paper considers learning at, through, and for work in relation to future-oriented learning, understanding pedagogy and learning is a necessary core focus.

For many decades now, pedagogy refers not just to the teaching of children, but to the teaching of groups and individuals of any age. In their study of FOP, Bound et al. (2024) expanded pedagogy to mean the beliefs and practices of the educator and their institution(s)/organisations; the interactions and relations between educator, learner(s), the space, artefacts, and intents of the learning and those involved. In this paper, an "educator" is anyone who has responsibility for any period of time for supporting the learning of others. In a firm or industry setting, educators may be supervisors, other experts, designated mentors, or coaches. In educational institutions and private training providers, "educator" includes trainers, lecturers, facilitators, guides, curriculum designers, and so on.

Concerning pedagogy, our understanding of learning is constantly evolving, as are our practices to support learning. Global evidence shows that a transmissive, monological pedagogy is still maintained (Guzmán & Larrain, 2021). Various studies have found that monologic discourses have negative effects on learners, e.g., while there are some gains in skills, learners are not engaged in critical types of learning experiences (Barker, 2003; Skidmore, 2006; Worthman, 2009).

However, in dialogic teaching, learners are required "to think, not simply to remember" (Skidmore, 2006, p. 504). The basis of dialogic teaching is the learner's use of language for appropriate meanings, interpreting, and making the meaning their own. This is a process of filtering through prior experience, knowing, and negotiation of meaning (Hung et al., 2005, p. 38). These processes take place through psychological signs, symbols, and other tools that mediate (Vygotsky, 1978) the meaning-making process. Learners also become comfortable with differences, manage multiple perspectives, learn how to build knowledge from multiple sources, improve on ideas, and learn how to learn (Bound et al., 2019; Edwards, 2010; Guzmán & Larrain, 2021; Wells & Mejia Arauz, 2006). These capabilities contribute to learners' ability to navigate and hopefully thrive in emergent, changing circumstances, i.e., become future-oriented. Dialogic pedagogical approaches are the basis of FOP (Bound et al., 2024).

We need to rethink the traditional theories of learning—behaviourism, cognitivism, and constructivism. These theories have long driven various approaches to learning, but there has been a disconnect between these theories and the realities and messiness of learning, including concerns such as the separation of mind and body, of theory and practice, and of context and behaviour. Sociocultural psychology that developed out of "concerns about the separation of mind and the world, or self and context" (Edwards, 2010, p. 65) instead situates learners in cultural contexts and their material artefacts which mediate actions and activity in relation to learning. We are always learning something which is not yet stable or understood (Engeström, 2001) and that which is emergent, as we co-construct which is emerging. Being future-oriented is implicit in such constructions of learning. This is core to what Bound et al. (2024) mean by "future-oriented"; namely, the ability of people and collectives (e.g., groups, teams, divisions, organisations, and institutions) to thrive in dynamically changing circumstances, to be able to remain comfortable with what is not yet known, with what is emerging, and to exercise their agency in shaping what is emergent.

Relations Between Context, Learning, and Pedagogy

What this means for learning at, through, and for work is that "organisations need structures and cultures that can capture and learn from the experiences of workers and teams to enable *continuous inquiry for organisational learning*" (Owen, 2022, p. 106). Owen also noted that we need to account for the active nature of workers in shaping their workplace contexts—as well as the process of being shaped by them. Core to learning in relation to work are skills such as asking questions, noticing, and sharing observations; giving and seeking feedback; making sense of new information; and seeking alternative perspectives, clarification, and consulting and collaborating (Owen, 2022, p. 106). These processes inform how we interpret and act on key features in the practices we inhabit, contributing to how we relate differently to reposition ourselves in the everyday practices of the work (Edwards, 2022). Expertise is not just developed inside the practitioner's head but also "expands the structures of knowledge to include not just mental and symbolic representations but also … recurring patterns of social practice" (Konkola et al., 2007, pp. 213–214). These learning processes contribute to the identities of individuals and collectives, thus any educator (person supporting learning in any way) needs to understand what is important for learners—individuals and collectives—as how identities are shaped is important in moving towards future-oriented being and becoming.

For worker-learners to take forward their intentions and potential contributions, they need to have both organisational permission and the ability to negotiate what matters to them and recognise their own and the organisation's values that inform the practices they engage in every day. Therefore, beyond individual learning, a firm needs to have the conditions that support learning and to learn as an organisation, ideally to develop dynamic capabilities. This symbiotic relationship is further deepened when individual worker-learners exhibit responsible agency by being aware of the implications of their actions on others and society more broadly.

In summary, the discussion in this review of the literature brings together pedagogy, learning, and the context of work. Opportunities for learning and being and becoming future-oriented are mediated by strategic business decisions that become integrated into everyday practices. An organisation that encourages questioning and deepening understanding through collaborative sharing, probing, and reflection across the boundaries within it not only continuously builds a highly competent workforce, but is likely to build dynamic capabilities. Dynamic capabilities enable an organisation to not only be highly responsive to dynamic contexts but potentially be at the head of the game in strategic niches at different points in time, enabling it and its people to thrive. Pedagogies that contribute to such possibilities need to be future-oriented to align with business strategies that are future-facing.

The Potential of Enacting Pedagogy and Learning Through National Trades Union Congress Company Training Committees

NTUC's website explains that its CTCs were established to help workers become Worker 4.0 (proficient in working with machines, using technology, and tapping digital resources to be more productive at work); and to partner companies in their transformation towards Industry 4.0. "Combined, these will help our workers have better Wages, Welfare and Work Prospects."[1]

The aims of CTCs, of which there are now over 1,900, are to:

- identify jobs that are likely to be disrupted due to industry transformation;
- assess skills development gaps;
- map out new skills and competency requirements as well as progression pathways for the workforce;
- put in place relevant training programmes to help employees take on new roles;
- track demonstration of the acquired skills and competencies;

[1] For more details: https://www.ntuc.org.sg/uportal/programmes/company-training-committees.

- undertake communication initiatives for workforce to embrace change and have a lifelong learning mindset.

These Committees involve union leaders working closely with management towards:

- identifying the skills and training that workers need to support the company's strategic vision and direction and to keep up with industry transformation;
- coordinating efforts to communicate and implement training plans to build new competencies, close existing skills gaps, and enhance productivity through technical, adaptive, and technology skills to realise the company's vision for the future;
- enhancing and implementing a workforce upgrading plan, to help ready workers for the evolution of jobs, stay relevant with new skills, and be resilient to new ways of working, towards better jobs, better pay, and better career progression.

The Singapore government has long had a focus on productivity; it is a key part of the Singapore story that people are its key asset (Bound, 2015). Buried in the last point of each list above is a focus on the future. The narrative held within the above points is the one of workers being at the behest of change over which they have limited control; and that when worker learners position themselves as future-ready, they will be rewarded with better jobs, pay, and career progression. This is a questionable claim. However, it does open a space for thinking differently about change, relevance of skills, and productivity.

Pedagogies with the intent to develop future-orientedness (rather than a static state of future-ready) position worker-learners as active in change, to work with what is emergent in creative ways; question taken-for-granted practices that may no longer be the best fit for new or emerging challenges, products, and services; and be comfortable with difference in order to navigate uncertainty and the unfamiliar. These capabilities develop worker-learners' learning capabilities and their expertise as particular kinds of practitioners. More than technical skills, worker-learners develop holistic capabilities, and as such are better able to improve their contributions to productivity.

In the following section, I will share the FOP framework. Subsequently, I will consider how NTUC CTCs could use the FOP framework.

Methods

Bound et al. (2024) adopted a mixed methods approach using different qualitative and quantitative approaches to examine the current pedagogical practices and analyse how Singapore's Training and Adult Education ecosystem mediates these practices. One of the objectives included developing a FOP framework. FOPs refer to the pedagogical *intent and enactment* of *growing future-oriented learners* who:

- work with what is emergent, unknown, and complex;
- question taken-for-granted practices, necessary for working in changing circumstances;
- exercise their natural curiosity, critically evaluate, be comfortable with differences, and know how to navigate the unfamiliar;
- grow their identity as learners and as practitioners.

Ethical approval was given by the Institute for Adult Learning, Singapore on April 7, 2022.

Sample

Our sample captured the experiences of learning and teaching in five industries: business and finance (*n*=5 training providers [TPs]), food and beverage (*n*=3 TPs), healthcare (*n*=3 TPs), manufacturing (*n*=2 TPs), the Training and Adult Education sector (*n*=5 TPs), and the ed-tech sector (*n*=13 TPs). Ed-tech providers consented to interviews with their directors and managers.

Training providers from the selected industries include Institutes of Higher Learning and private training organisations. Adult educators from the participating training providers were interviewed. A wider group of educators and training providers took part in dialogue sessions and in a quantitative online survey measuring the beliefs and pedagogical practices of the respondents.

Data

A range of data types were collected:

1. Curriculum documents were collected and analysed (*n*=18). Sample selection was purposeful, based on a combination of information from SkillsFuture Singapore, and necessarily involved the use of organisational networks as we sought to meet our desired number of participating organisations. Providers selected included a mix of Workforce Skills Qualifications and non-Workforce Skills Qualifications courses.
2. Observations of teaching (*n*=21) and interviews with curriculum designers, adult educators, and heads of programmes/management (*n*=45) were undertaken in each of the participating organisations.
3. Dialogue sessions (focus groups run as dialogue sessions) of 2.5 hr each were conducted with learners, educators, training providers, and unions (*n*=61 participants). Permission was gained to use approved lists to approach the organisations (TPs) and educators. Responses included NTUC educators.
4. Brookfield's (1995) Critical Incident Questionnaire (CIQ; five open-ended questions) was completed by learners (*n*=226) at the end of each observation. Learners opted to either complete it or not. In some cases, hard copy was used, while in other cases a QR code was provided for learners to complete it online. The CIQ [2] was administered to the learners in 13 of the courses in order to gather their perspectives on the lesson they had just completed.
5. The quantitative online survey was administered to 800 members of the Adult Education Network in Singapore. Its purpose was to gather the beliefs and practices of Adult Educators (AEs). A total of 355 members responded. After removing duplicate entries and ineligible respondents, there were 195 completed surveys.

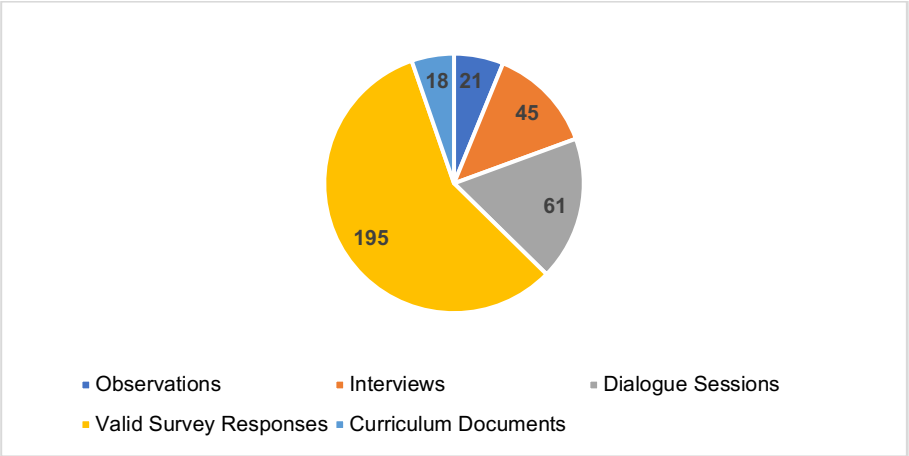
The total number of data points was 340 (Figure 1). In addition, the thoughts and experiences of academic and industry experts were captured through academic panel discussions (two meetings with the whole panel and three meetings with selected panel members) and two reference group discussions. Reference group members were selected to participate in these sessions on the basis of their standing in the sector.

[2]The Critical Incident Questionnaire:

1. At what moment in class did you feel most engaged with what was happening?
2. At what moment in class were you most distanced from what was happening?
3. What action that anyone (teacher or student) took this weekend you found most affirming and helpful?
4. What action that anyone took this weekend you found most puzzling or confusing?
5. What about the class that surprised you the most? (This could be about your own reactions to what went on, something that someone did, or anything else that occurs to you.)

Figure 1

Number of Participants in Each Type of Data



Analysis

Curriculum analysis was undertaken by using a very early form of the framework. Interviews and dialogue sessions were coded in NVivo, using thematic, inductive analysis to reveal pedagogical practices, beliefs, and what mediated and shaped pedagogical practices. The CIQ was analysed separately to identify common themes and differences. In the survey, we looked for similarities and differences between our analysis of the findings and what the survey of beliefs and pedagogical practices was telling us.

What We Found

Similar to international studies, we found that traditional, monological pedagogy, or what we named in our FOP framework as the "Reproducing Knowledge" (RK) pedagogical approach, remains dominant in Singapore. However, we also observed educators and training providers using pedagogical approaches that are/show considerable promise for being future-oriented.

RK is based on what is often termed in the literature, discussed briefly in the section "Learning In and Through Work", as traditional or monologic approaches (Alexander, 2008; Macneill et al., 2005; Nystrand, 1997; Skidmore, 2006). What we saw in the data was that much of the time educators used PowerPoint, did much of the talking (a monologue), and used the Initiation-Response-Feedback (IRF) (see the section "Learning In and Through Work"). However, when we saw evidence of learners' engagement with the materials and ideas, where they were learning about what is already known, we called this Distributed Knowing. "Distributed" comes from the community of practices literature where knowledge becomes *knowing*, through accessing and engaging with others, with the tools being used and by "doing" within a situated context. We labelled activities as Dynamic Generative Knowing (DGK) approaches when we saw the data that learners were engaged in, for example, dialogic inquiry and knowledge building.

Having identified these different pedagogical approaches, we went deeper into the data to identify what was driving these different approaches. Here, we accessed the full range of data to identify four different aspects that differed in each pedagogical approach (RK, Distributed Knowing, and DGK). These aspects are discussed below (see Table 1):

1. *Beliefs* refer to an educator's, an institution's, an enterprise's, or a national system's beliefs about learning, teaching, knowledge, and learners.
2. *Who is doing the work of learning* refers to relations between educator(s), learners, and artefacts (e.g., a case study, a digital game) and who is doing what. For example, who is doing most of the talking, who is contributing expertise, who is asking questions, and who is doing the sense-making are examples of the work of learning.

3. *Assessment* is usually considered part of learning design, but we have separated it out because if we give specific attention to assessment, as this can be a powerful tool for change. Assessment and learning are intertwined, not separate processes or activities. As with learning design, the Six Principles of Learning Design (Bound & Chia, 2020)—authentic, alignment, holistic, feedback, judgement, and future-oriented—are used to guide the design of all types of assessment—summative, formative, diagnostic (Darling-Hammond, 2014), and sustainable assessment (Boud, 2000).
4. *Learning Design* involves the Six Principles of Learning Design to guide the design of the "dance" along the pedagogical practices' continuum in any area where learning occurs seamlessly between spaces—workplaces, digital environments, classrooms, laboratories, and so on.

Table 1

The Structure of the Future-Oriented Pedagogies Framework

Aspects of Pedagogical Practices	Reproducing Knowledge	Distributed Knowing	Dynamic Generative Knowing
Beliefs about teaching, learning, learners, and knowledge			
Who is doing the work of learning?			
Assessment			
Learning design			

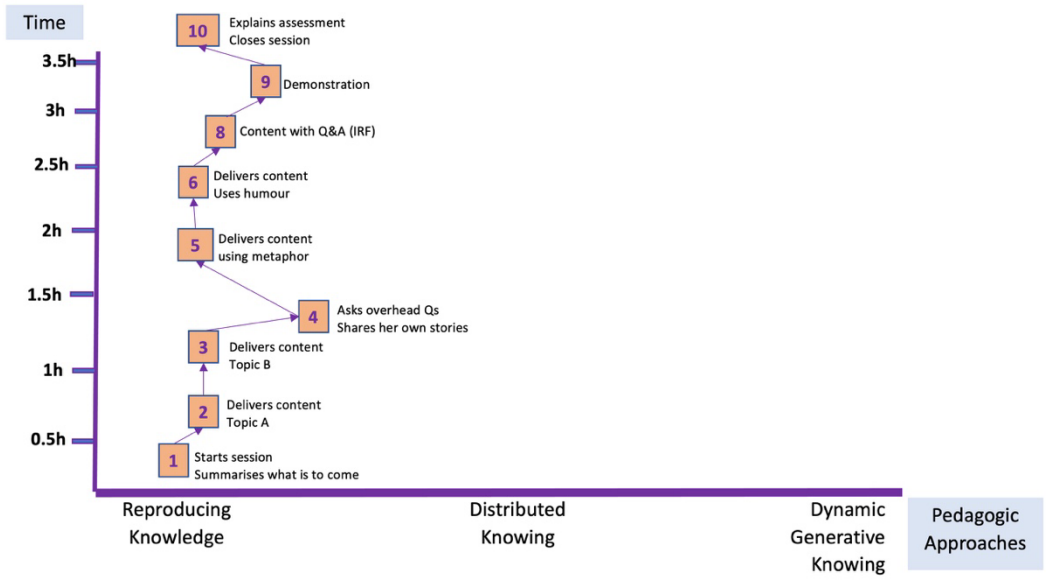
The Future-Oriented Pedagogies Framework as an Analytical Tool

Examples of what the different pedagogical practices look like in classrooms and online where learning was *for* work, are shown in Figures 2 and 3. Each number in the map denotes a different activity. Figure 2 is an example of an RK approach. The observed session was entirely concerned with downloading content. The educator was following the curriculum design (learning design), suggesting that the curriculum designer believed learners must be taken through the content step by step, and that they cannot begin with complex situations (such as what they experience in their everyday work). Their *belief* about learning appeared to be that learning is about acquiring knowledge as a commodity to be owned by individuals, and that this does not require active engagement with the content. This implies that knowledge is handed to learners by experts.

Assessment (not shown in Figure 2, but evident in the curriculum documentation) required learners to reproduce what they had been told through demonstration and multiple-choice questions (RK). *Who was doing the work?* The educator was doing all the work of learning, and making sense of the content. The role of learners was to listen and respond to short answer questions. At one point (item 4), the educator, who presented very professionally and knowledgeably, asked two questions that required learners to think about application in their own contexts. She was met with silence. This is often the pattern when learners have been given the implicit message that their role is mainly to listen. As for the *design of learning*, certainly, the examples and material the educator shared were authentic, but the learners were not working with this authentic material. Thus, there was no opportunity for learners to experience holistic learning, give feedback, make judgements, or develop learning to learn capabilities (other principles in the Six Principles of Learning Design).

Figure 2

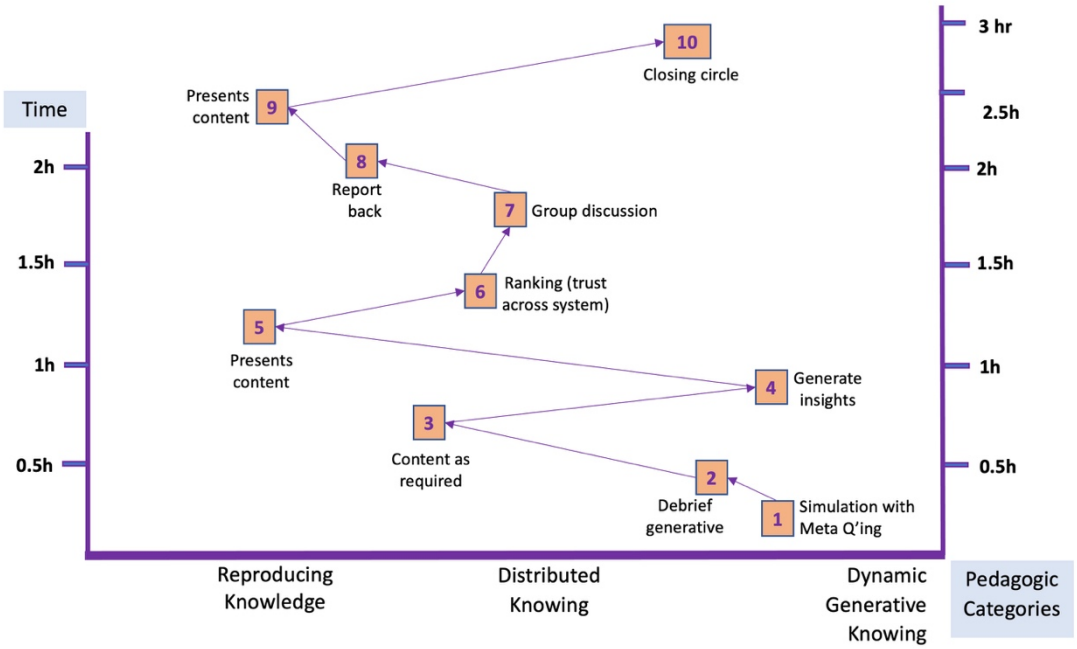
Reproducing Knowledge: Food and Beverage Hygiene Course (Workforce Skills Qualifications)



Unlike Figure 2, there is a "dance" across different pedagogical approaches in Figure 3. Data from our dialogue sessions with adult educators, training providers, and the first reference group session identified a belief amongst some that short courses (one to two days) mean there is so much content to get through that there is little choice but to use an RK approach. However, the data in Figure 3 and other data collected show that this is not so. Like the Food and Beverage Hygiene course in Figure 2, the leadership course in Figure 3 is a one-day course. The "dance" or movement across the different pedagogical approaches is illustrative of an intent to change thinking and practices. Indeed, this course was one part of a systemic approach to change practices to holistic patient care.

Figure 3

A Dance Towards DGK: An In-House Leadership Course in Health



In activity 1, when learners entered the room after lunch, they were engaged in a simulation game about power. Each table (each of the three tables had different artefacts or lacked representing their power) was asked to discuss three different questions: What is your perception of your own group? What is the group's perception of other groups? The big meta question: How does your group envision other groups to change health care for the better? There was a strong alignment between the design of learning, beliefs, and pedagogical practices (part of the design of learning). The educators believed in their people and their abilities to make sense of their world. One Adult Educator, Janine, commented that "we see it as an intervention to develop people". Eric (management) spoke of the need for a holistic understanding of change and developing change agents:

> As a person, the character and define who they are, actually … I help them make better sense of what's going on in their lives. Beyond clinical capabilities, the need for staff to be "making sense" of what is happening across the sector, the hospital and specifically of the why and value of the change processes … Enables them [staff] to be all-rounded … to do the job that they need to do … [and] contribute to a shared mission … [be] agents of change.

Learners are equipped with a repertoire of tools, a "magic box" (Eric) to enable problem-solving and use of a common shared language in their day-to-day work. Learning is understood as requiring active engagement, constant opportunities for dialogue, experiencing emotions, thinking big, and moving back and forth between the big picture and day-to-day realities of the work. Learners are assumed to be not just active sense makers but knowledge builders. Learners were doing much of the work with the educator inputting content (see boxes 5, 7, and 9 in Figure 3) at different points. Educators asked open, inquiry questions or used closed questions as a prelude to first focus on responses and thinking before opening up the dialogue. As learners asked questions, they either threw the question back to the group or gave input, aiming to push thinking further. Typical of DGK learners and educators was inquiring—examining, exploring, delving into, querying, investigating, and interrogating (Martinello & Cook, 2000). Assessment was informal, i.e., educators were making diagnostic assessments throughout the session and made adjustments according to the responses they received. The design of learning met all six principles of learning design.

An Appetite for Change

The data shows there is a clear appetite for change from monological pedagogies for learning to future-oriented pedagogies, be it in workplaces, classrooms, online, or elsewhere. Indeed, a central message arising from our research is the necessity for systemic approaches to elevate support for current and upcoming generations of learners. Selena, curriculum designer from an ed-tech firm, expressed this need for change:

> To be very honest, we are preparing for something which we have never experienced before. It's important to be aware of it and then to, to then start breaking free from our own mental models so that we can better leverage on our capabilities to help the next generation of learners… because what has worked for us right, what has been impactful for our learning or our generation of learners, may not be so for future learners. And actually frankly because of the way things are moving right, within a year or two…a lot of things will have become obsolete.

Although our observations were of classroom pedagogical practices, our reference group and participants in dialogue sessions spontaneously pointed out that they saw the FOP framework as being highly applicable to work settings. No matter the learning space—classroom, online, or work—different pedagogical approaches are evident as the educator (whoever has the responsibility for learning in that moment, including, for example, the designer of online learning) and worker learner interact. What happens in exchanges between worker-learner and educator can be analysed using the four different aspects of the FOP framework (beliefs, who is doing the work, assessment, and design of learning) to identify what the pedagogical practices are. The possibilities for this are taken up in the subsequent section.

Qualities of Training Provider Firms That Exhibited DGK Pedagogical Approach

The Case of USH

This case is an extract from Bound et al.'s (2004) research report. USH (a pseudonym) is a large hospital committed to change across its many departments and thousands of employees. Those we spoke with and observed across different divisions and settings have an expansive horizon of possibilities. At different levels of leadership and staff, we heard different expressions of the shared narrative of change that each person had internalised as their own. Vivian (management), for example, described herself as a "culture architect". Janine (educator) wants her learners to be a "contributor of a shared mission … agents of change". Bianca (management) commented that "when … uh, I don't know what the end point is, you're really creating a whole new model. Then I think we've got to uh create those realities together." Eric (management) reflected:

> For me it's about … pushing the boundaries ... I don't, I hate to lead L&D teams where we are compliant and we will never be able to make a difference. I think one thing we do very differently here is the fact that we strongly believe in collective … We're all here to make a difference in however small or big ways to.... The ultimate endgame is for our patients actually.

Common across these quotes is the importance of collective, creating new realities together to develop cultures that support change for holistic patient care. Notable also is the reference to creating change agents at all levels in the organisation. The focus is not just on individual staff but on creating capabilities, tools, and systems that support collective change (creating those realities together).

Like any firm, training providers vary in their organisational capabilities. Private for-profit training providers where we observed DGK pedagogical approaches were notably different from those that used predominantly the RK pedagogical approach. Providers achieving DGK pedagogical approaches have expansive partnerships, leadership that is flexible, caring, and agile, a well-developed supportive learning culture, more sophisticated understandings about pedagogies, and are learner-centred. These qualities and organisational capabilities contributed to their use of FOP practices (use of DGK). Across the organisation, its people are engaged, internally and externally, in boundary-crossing activities (Bound et al., 2004). This move away from silos within the organisation contributes to a culture that is open, willing to explore, and learn from mistakes, cultivating capabilities as an organisation and within its people that support a dynamic approach towards change. We can draw parallels between these training providers and other types of firms.

Obviously, different organisations differ in their qualities. For example, Rohei's value base is characterised by a strong commitment to experiential learning, professionalism, client focus, and continuous improvement of learners and educators across the organisation. Quality assurance processes underpin all aspects of organisational and pedagogical practices. In the health sector, Illume's (a pseudonym) emphasis is on the holistic development of learners, supported by a forward-thinking approach that goes beyond the scope of the current skills framework to build a workforce adaptable to change. These organisations highly value their staff, whose voices were heard and acted upon.

Providers with a more transactional approach to their business, such as a provider we called Fabrico, had a primary emphasis on aligning training with existing industry standards focussing on immediate skills acquisition, evident in their predominantly RK pedagogical approach, and an inward-facing focus. Without diverse partnerships and market intelligence, there is a limit to knowing what else is possible; without a supportive learning culture and a leadership committed to creating and developing such a culture, staff and adjuncts do what is required, rather than contributing new ideas, experimenting, and sharing ideas. This applies to any firm.

Discussion

How can the framework be used in work settings to support the development of FOP? A strong learning culture is a good starting point as it is indicative of support for dialogue, knowledge building, and inquiry that are characteristic of DGK. However, whatever the learning culture in an organisation, if there is an interest in developing supportive work and learning culture and developing people to be future-oriented (able to work with what is emergent, unknown, and complex; question taken-for-granted practices, necessary for working in changing circumstances; exercise their natural curiosity, critically evaluate, be comfortable with difference, and know how to navigate the unfamiliar; and grow their identity as learners and as practitioners), the FOP framework is a useful tool to analyse and make visible what pedagogical approaches are being used within the organisation. Being able to name what pedagogical approaches have been used can be a starting point for deciding where to from here, how to build on existing pedagogical practices, and strengthen the dance across pedagogical approaches.

The FOP framework can be used as a reflective tool, providing a language to think, plan, and implement change to ensure a "dance" across pedagogical approaches within a firm. As part of this process, Bound et al. (2024) suggested the following:

1. Educators (those responsible for supporting the learning of others) can come together to use the framework promptly to give and receive feedback on their pedagogical approaches.
2. Curriculum designers and those managing curriculum can use the FOP framework to analyse the curriculum and the practices of those facilitating any formal courses.
3. Human resource personnel and NTUC CTCs can use the FOP framework to align their pedagogical approaches with external training providers.

To put this into practice, the means the need to justify the ends, i.e., there needs to be consistency in the desire to develop future-oriented workers and how that is achieved. DGK pedagogies (essentially dialogic approaches) are used as a means of enabling inclusiveness for all voices to be genuinely heard and people are afforded opportunities to exercise their agency. These are core to developing a supportive work and learning environment where innovation, quality, and collaborative development of solutions to emergent, complex problems can thrive.

Educators and NTUC CTC members could come together, if necessary, initially with an external facilitator. This work might involve the following:

1. Preparation prior to coming together: (a) participants writing or recording an explanation on what they believe learning is and what they believe it means to support the learning of others; and (b) participants capturing interactions where they were supporting learning (e.g., writing it up immediately afterwards). Individual names should be avoided.
2. Use the FOP framework to map the recorded interactions, and to make visible the pedagogical approaches (as in Figures 2 and 3). Compare the differences and examine why different activities were placed on the "map" of pedagogical practices where they existed.
3. Collectively reflecting on the beliefs about learning that they captured prior to the session, and considering differences in beliefs and what this means for the use of different pedagogical approaches against the FOP framework are helpful for this activity.

An example of capturing supporting learning might be conducting a demonstration. This is a very common teaching and learning strategy to teach a skill or how to do a simple task. The pedagogical approach used is often that of reproducing knowledge. This is because it is basically used to show and tell, and perhaps asking, the observer to repeatedly practice the process and correct it as required. This RK approach can be enhanced enabling deeper understanding and potential to develop mastery. For example, before showing the observer how to do the task, get them focussed on what is coming up—ask them what they have noticed about others doing the task, or what they think is important. Engage in a discussion about what is important to look for (listen, smell, and so on, whichever is relevant). At that point show them how to do the task. Then ask them what they noticed. They are likely to describe what they saw and it is likely that they

would have missed important aspects (e.g., the stance to protect one's back if the task involves lifting, the smell at a certain point in a cooking process, the way a tool is held, etc.). As you discuss together, share the "why" behind doing a task in a particular way. Once the "why" is understood, it is easier to apply and to adapt when required. Keep repeating these processes of demonstration, practice, and discussion as needed. These processes help develop a person's "noticing" capabilities enabling them to observe other tasks and pick them up more readily. Once you engage in this sort of dialogue, you are tapping into distributed knowledge, what they already know, what you know, and the common practices and norms in the work setting. Now you have a "dance" between RK and Distributed Knowing. To stretch towards DGK may or may not be necessary depending on the nature of the task. DGK would involve a complex problem where likely the task needs to be modified in that situation.

The *process* of mapping using the FOP framework generates dialogue, and in the process, helps to develop the language to talk about pedagogical approaches. It also helps highlight differences between espoused beliefs (what individuals and the organisation collectively believe learning is and what it means to support learning) and what they actually do. Quite often, there is a difference that becomes evident with repeated mapping to the FOP framework.

Educators coming together to make visible pedagogical approaches develop a language to talk about pedagogical approaches and strategies and to share different strategies to support the learning of others. This initial work can provide the basis for the strategic work of further developing a firm's pedagogical approaches and practices.

Using the FOP Framework in Working With External Training Providers

The FOP framework can also be used to work with external training providers. A starting point might be analysing the need for external training and development. How are the firm and the training provider thinking about these needs? What is the long-term intent? What does the firm want its people to be and become? Is being future-oriented important to the firm? If so, then this must be implicit in interactions in order to gain the trust of its people and the credibility of change efforts. All too often, people are burnt out by yet another change effort in the firm. Developing future-oriented people means that the firm is more likely to develop its collective dynamic capabilities that enable it to be agile not just to respond to external influences and events but to question and move forward strategically.

Does the training provider share these values and ways of working and the intent to develop future-oriented people? The FOP framework becomes a boundary-crossing object to guide discussion of specific approaches, strategies, and desired outcomes. When using multiple learning spaces (e.g., any combination of online, classroom, and work settings), it is important that the learning is seamless, as was the case with USH. In USH, there was a flow between the classroom and WhatsApp group to support participants to put their learning into practice. Groups self-formed to share their experiences and ideas face-to-face. A question for those engaging and overseeing the quality of the work of external providers is how such a flow will be achieved. This needs the support of the firm and the training provider.

The FOP framework can be used to prompt questions and discussions about who is doing what work. What are the assumptions and beliefs embedded in actions and activities that support learning? How does the design of learning support the development of future-oriented learners able to work with what is emergent, unknown, and complex; question taken-for-granted practices, necessary for working in changing circumstances; exercise their natural curiosity, critically evaluate, be comfortable with difference, and know how to navigate the unfamiliar; and grow their identity as learners and as practitioners? If there is formal assessment, how are the design and enactment of that assessment aligned with the intent to develop future-oriented learners?

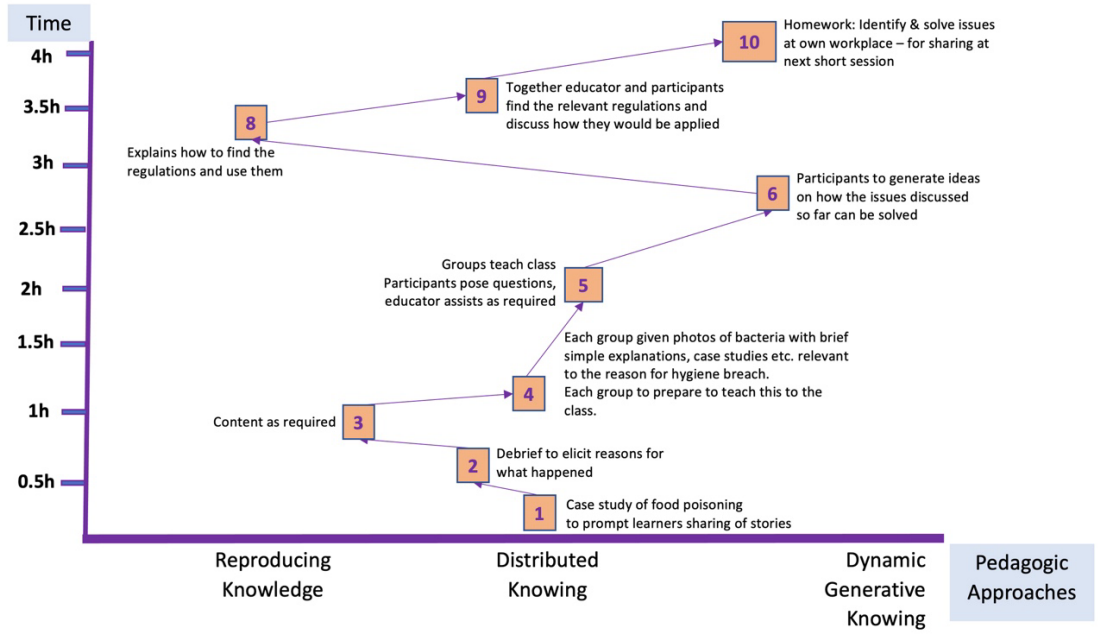
Does the FOP Framework Apply to Skills-Based Development?

Yes, the FOP framework does indeed apply to skills-based courses. For example, Figure 2 shows a Workforce Skills Qualification, knowledge–skills–attitudes Food and Beverage course

that was designed and delivered using an RK approach. Figure 4 shows one of any number of possibilities for how the course could be redesigned. Note that there is now a "dance" across the pedagogical practices, such that the role of learners is different. Learners are actively engaged with the materials and sense-making and are in the process of becoming competent practitioners who know how to use and apply the regulations and address relevant workplace issues. Learners are asked to teach other groups. This process builds confidence and trust in each other and promotes constructive feedback—which may need to be modelled and scaffolded depending on the capabilities of the particular group. Starting with their stories and experiences means that learners are actively engaged from the beginning; this sets up an expectation of their active role in their learning.

Figure 4

Redesign of Food and Beverage Hygiene Course



Conclusion

This paper has shared some key insights from a study of developing FOP (Bound et al., 2024). The FOP framework developed in this study can be used in any number of ways to support the development of those who support learning in workplaces (whom I have called educators). Specifically, for NTUC CTCs, it offers a reflective tool to guide the thinking, identification, and planning of learning within the firm.

BIOGRAPHY

Helen Bound

Associate Professor Helen Bound is Principal of Learning Futures. She spent 14 years at the Institute for Adult Learning, leading research in learning in and across different environments, pedagogical innovations, workplace learning, professional learning, and learning through collaborative and boundary-crossing activity. She has led many research projects and published extensively, including 4 books. Additionally, Helen continues to teach in the Master of Boundary-Crossing Learning and Leadership which she led the design for, and designs and runs workshops. Prior to coming to Singapore, Helen's varied career included teaching secondary students, working as a breakfast cook, elder care, as a national industry training officer in the Australian Trade Union Movement, and as a union training officer.

REFERENCES

Alexander, R. J. (2008). *Towards dialogic teaching: Rethinking classroom talk* (4th ed.). Dialogos.

Barker, L. C. (2003). *An examination of discourse writing conferences with adult learners: The monologic-dialogic dynamic*. Simon Fraser University. https://summit.sfu.ca/item/8492

Bessant, J., Rush, H., & Trifilova, A. (2012). 'Jumping the tracks': Crisis-driven social innovation and the development of novel trajectories. *Die Unternehmung - Swiss Journal of Business Research and Practice*, *66*, 221–242. https://doi.org/10.5771/0042-059X-2012-3-221

Billett, S. (2015). Positioning personal mediation as being central to workplace learning. In H. Bound & P. Rushbrook (Eds.), *Towards a new understanding of workplace learning: The context of Singapore* (pp. 54–87). Institute for Adult Learning, Singapore.

Boud, D. (2000). Sustainable assessment: Rethinking assessment for the learning society. *Studies in Continuing Education*, *22*(2), 151–167. https://doi.org/10.1080/713695728

Bound, H. (2015). Conclusion: Towards a new understanding of workplace learning. In H. Bound & P. Rushbrook (Eds.), *Towards a new understanding of workplace learning: The context of Singapore* (pp. 194–204). Institute for Adult Learning, Singapore.

Bound, H. (2024). *Future oriented pedagogies* (FOP Research Note No. 1). Institute for Adult Learning, Singapore.

Bound, H., & Chia, A. (2020). *The six principles of learning design. Designing learning for performance*. Institute for Adult Learning.

Bound, H., Murphy, I., Chan, S., Choy, M., & Mohamed, F. (2024). *Developing future-oriented pedagogical practices in the TAE sector*. Institute for Adult Learning.

Bound, H., Tan, S. C., Chow, A., Wang, X., & Chuen, K. H. (2019). *Dialogical teaching: Investigating awareness of inquiry and knowledge co-construction among adult learners engaged in dialogic inquiry and knowledge (co)construction*. Institute for Adult Learning.

Brookfield, S. (1995). *Becoming a Critically Reflective Teacher*. San-Francisco: Jossey-Bass.

Darling-Hammond, L. (2014). *Next generation assessment: Moving beyond the bubble test to support 21st century learning*. Jossey-Bass.

Edwards, A. (2010). *Being an expert professional practitioner: The relational turn in expertise*. Springer. https://doi.org/10.1007/978-90-481-3969-9

Edwards, A. (2022). Rethinking learning for a high skills economy: What a cultural-historical approach can offer. In H. Bound, J. P.-L. Tan, & R. W. Y. Lim (Eds.), *Pedagogies for future-oriented adult learners flipping the lens from teaching to learning* (pp. 35–48). Springer. https://doi.org/10.1007/978-3-030-92867-4_3

Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, *14*(1), 13314–13156. https://doi.org/10.1080/13639080020028747

Engeström, Y., & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, *5*(1), 1–24. https://doi.org/10.1016/j.edurev.2009.12.002

Evans, K. (2015). Developing the creative potential of the workforce: Rethinking the part that work-based learning can play. In H. Bound & P. Rushbrook (Eds.), *Towards a new understanding of workplace learning: The context of Singapore* (pp. 17–35). Institute for Adult Learning.

Evans, K., Guile, D., & Harris, J. (2011). Rethinking work-based learning: For education professionals and professionals who educate. In M. Malloch, L. Cairns, K. Evans, & B. O'Connor (Eds.), *The SAGE handbook of workplace learning* (pp. 149–162). SAGE. https://doi.org/10.4135/9781446200940.n11

Fuller, A., & Unwin, L. (2004). Expansive learning environments: integrating personal and organisational development. In A. Fuller & L. Unwin (Eds.), *Workplace learning in context* (pp. 126–144). Routledge. https://doi.org/10.4324/9780203571644

Giniuniene, J., & Jurksiene, L. (2015). Dynamic capabilities, innovation and organizational learning: Interrelations and impact on firm performance. *Procedia - Social and Behavioral Sciences*, *213*, 985–991. https://doi.org/10.1016/j.sbspro.2015.11.515

Guzmán, V., & Larrain, A. (2021). The transformation of pedagogical practices into dialogic teaching: towards a dialogic notion of teacher learning. *Professional Development in Education*, 1–14. https://doi.org/10.1080/19415257.2021.1902837

Hung, D., Tan, S. C., & Chen, D. T. (2005). How the internet facilitates learning as dialogue: Design considerations for online discussions. *International Journal of Instructional Media*, *32*(1), 37–46. https://www.learntechlib.org/p/64248/.

Konkola, R., Toumi-Grohn, T., Lambert, P., & Ludvigsen, S. (2007). Promoting learning and transfer between school and work. *Electronic Journal for Leadership in Learning*, *20*(3), 211–228. https://doi.org/10.1080/13639080701464483

Macneill, N., Cavanagh, R., & Slicox, S. B. (2005). Pedagogic leadership: Refocusing on learning and teaching. *International Electronic Journal for Leadership in Learning*, *9*(2), 1–11. http://iejll.journalhosting.ucalgary.ca/iejll/index.php/ijll/article/view/402

Martinello, M., & Cook, G. (2000). *Interdisciplinary inquiry in teaching and learning*. Merrill.

Nystrand, M. (1997). *Opening dialogue: Understanding the dynamics of language and learning in the English classroom*. Teachers College Press.

Owen, C. (2022). Enhancing learning in the workplace. In H. Bound, J. P.-L. Tan, & R. W. Y. Lim (Eds.), *Pedagogies for future-oriented adult learners flipping the lens from teaching to learning* (pp. 103–121). Springer. https://doi.org/10.1007/978-3-030-92867-4

Skidmore, D. (2006). Pedagogy and dialogue. *Cambridge Journal of Education*, *36*(4), 503–514. https://doi.org/10.1080/03057640601048407

Teece, D., Pisano, G., & Shyen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press. https://doi.org/10.2307/j.ctvjf9vz4

Wells, G., & Mejia Arauz, R. (2006). Dialogue in the classroom. *Journal of the Learning Sciences*, *15*(3), 379–428. https://doi.org/10.1207/s15327809jls1503_3

Worthman, C. (2009). Success stories: Adult learners co-constructing a learning context and the implications for identity development. *Journal of Adult and Continuing Education*, *15*(1), 55–75. https://doi.org/10.1177/147797140901500106

Five-Stage Framework of Technology Domestication in the Workplace: An Organisational Case Study of Implementing a Mobile Management Software

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Abstract

With the rise of remote working due to the Coronavirus disease 2019 (COVID-19) pandemic, organisations today increasingly adopt mobile collaborative technologies such as instant messaging platforms, enterprise social media, and project management software to facilitate a variety of work and communication practices. While previous studies on workplace digital transformation have surfaced the wide-ranging implications of digital technologies for organisational functioning, the complicated process of integrating new technologies into an organisation's workflow, especially in Small and Medium Enterprise (SME) settings, is hitherto understudied. Given the pressing need of digitalisation and the myriad challenges faced by SMEs, it is imperative to uncover the complexity of collective decision-making, interaction, and negotiation during the process of implementing digital technologies in the workplace environment of SMEs. As an effort to shed light on this missing link, we conducted an in-depth ethnographic case study on the dynamic process of implementing a self-developed mobile management software in a construction SME in Singapore. Drawing on technology domestication theory, a five-stage workplace technology domestication framework was developed in which various stakeholders, including the company's CEO, office staff, shop floor workers, and the developer team, engaged in ongoing and multifaceted negotiations revolving around the application of the new technology and the changes it heralded. During the domestication process, the functionality and meanings of the software as well as employee acceptance and user experiences were continuously reconfigured by a constellation of technological, individual, organisational, and sociocultural conditions. This study uncovers the iterative and participatory nature of technology design and implementation in the workplace, thereby opening up a promising approach for SMEs to maximise benefits from digital transformation with limited resources available.

Introduction

For contemporary organisations, digitalisation is no longer an optional extra but crucial for remaining viable and competitive (Westerman et al., 2014). It is increasingly evident that the adoption of digital technologies, such as integrated project management software, instant messaging (IM) networks, and enterprise social media (ESM), yields improvements in company operations and services, provides access to new customers and markets, and enhances workplace coordination, communication, and knowledge sharing among employees (Anders, 2016; Azarova et al., 2022; Hess et al., 2016; Leonardi et al., 2013; Treem & Leonardi, 2012; Verhoef & Bijmolt, 2019). Amidst the surge in remote working propelled by the COVID-19 pandemic lockdowns, the significance of digital technologies has reached unprecedented levels, empowering organisations to effectively manage distributed teams and maintain organisational functioning via virtual means (Kudyba, 2020; Soto-Acosta, 2020; Zeynalli & Zeynalli, 2022).

Despite their beneficial implications, digital technologies could potentially lead to detrimental effects in the workplace if not implemented judiciously. Most prominently, the introduction of new technologies often disrupts established workflows and imposes extra workloads, leading to employee resistance to technology-induced changes (Lapointe & Rivard, 2005; Prasad & Prasad, 2000; Shapiro, 2018). Therefore, successful implementation of new technologies in the workplace is challenging as it encompasses a dynamic and complicated process that requires ongoing negotiation between the management, employees, and other relevant stakeholders. While prior research on workplace digital transformation has delved extensively into the motives behind organisational technology adoption and its impact on the nature of work, the complexity surrounding decision-making, interaction, and negotiation during the technology implementation process remains understudied. This complexity forms the focal point of our study.

Small and Medium Enterprises (SMEs) face particular challenges in adopting digital technologies. At the micro level, digital transformations within SMEs often lag behind those of larger corporations due to constraints such as limited human capital and resources, as well as inadequate expertise in knowledge management (Ghobakhloo, et al., 2022; Lindman, 2004; OECD, 2021; Piercy, 2010; Ramdani et al., 2009). At the macro level, SMEs also encounter barriers arising from economic change and heightened competition, the dynamics of globalisation and deglobalisation, shorter product life cycles, evolving consumer needs, and notably, the rapid pace of technological development and disruption (Demirbas et al., 2011; Epede & Wang, 2022). While technology-related research on SMEs is slowly gaining momentum, there is a disconnect between existing approaches to technology adoption and the needs of SMEs (Masood & Sonntag, 2020). Given the significant contributions of SMEs to economic growth and their role in providing employment opportunities at low capital cost (Amoah et al., 2022; Fathian et al., 2008; OECD, 2019; Rotar et al., 2019), it is imperative to shed more light on their achievements, challenges, and strategies for effective digitalisation. To understand the challenges that SMEs face during digital transformation and identify ways to strengthen the implementation of new technology in SME workplaces, we draw on the lessons from an in-depth, ethnographic study on the implementation of a mobile management software in a construction SME in Singapore. The technology domestication framework is employed to assess how the organisation and its employees make sense of and negotiate the adoption of the new technology across the different implementation stages. Findings from this study contribute to technology domestication theory and literature on workplace technology adoption by uncovering the iterative nature of the domestication process as well as the invisible information and expectation asymmetries arising between various stakeholders during this process. The study also provides a promising approach for SMEs to pursue and benefit from digital transformation with limited resources.

Literature Review and Theoretical Framework

Implementing Digital Technologies in the Workplace

Organisations are increasingly implementing various collaborative technologies to facilitate workplace and organisational functioning. The last few decades saw studies investigating different ways digital innovation impacts work and organisational processes (e.g., Leonardi et al., 2013; Marsh et al., 2022; Treem & Leonardi, 2012). Various benefits have been noted such as enhancing cross-functional collaboration of work tasks, encouraging employee communication, knowledge sharing and innovation, as well as facilitating the remote working of distributed teams (Azarova et al., 2022; Ellison et al., 2015; Gibbs et al., 2013; Jiménez-Zarco et al., 2015; Leesakul et al., 2022; Mukherji & Arora, 2017; Steinfield et al., 2009; Treem & Leonardi, 2012).

Despite their benefits, the introduction of new technologies into workplaces may nevertheless introduce new burdens, tensions, and asymmetries that necessitate further negotiations. For instance, past research found that employees might respond with resistance to IT-enabled changes in the workplace, thus slowing the technology adoption process (Lapointe & Rivard, 2005; Prasad & Prasad, 2000; Shapiro, 2018). Other scholars have signalled concerns over how digital technology leads to the rise of digital surveillance (Shapiro, 2018; Treem & Leonardi, 2012). Top-down control of technology can also lead to the asymmetrical distribution of information and access that limits individual autonomy and decision-making (Shapiro, 2018). Moreover, as digital technologies enable employees to perform job tasks in and out of workplaces, the hyperconnected, always-on work culture, and blurring of work-life demarcation can adversely affect well-being (Burchell, 2015; Cousins & Robey, 2015; Omidi & Dal Zotto, 2023; Risi & Pronzato, 2021).

For SMEs, implementing digital technologies was found to transform their business processes and boost profits by enhancing service quality to customers, accelerating turnaround time, improving marketing and public presence, and fostering better business relationships with external partners (Chen et al., 2016; Harwood, 2011; Tick et al., 2022). Digital technologies also promote team collaboration, employee engagement, knowledge sharing, and workplace learning within SMEs (Atrash et al., 2015; Leesakul et al., 2022; Treasure-Jones et al., 2019; Zeiller & Schauer, 2011). While these studies have surfaced the wide-ranging implications that digital technologies can have on organisational functioning and the nature of work in SMEs, scant attention has been focussed on the complexity of decision-making, interaction, and negotiation when integrating new technologies. Given the increasing prevalence of digital technologies in SMEs following the remote working trend, it is imperative to look beyond questions of "why adopt" and "what influences work and workplace", to investigate "how to implement", "who participates", as well as "what happens during implementation".

Furthermore, limited research has been conducted on the implementation of self-developed custom technology. This is despite the encouraging findings from a few studies suggesting that self-developed custom products can offer SMEs tailor-made solutions and greater flexibility making them attractive and cost-effective alternatives to purchasing off-the-shelf solutions (e.g., Olsen and Saetre, 2007; Poba-Nzaou & Raymond, 2013). Developing greater insights here would be particularly useful in guiding SMEs seeking to develop and integrate new technologies. Hence, we seek to fill these gaps through an in-depth case study of implementing a customised mobile management system in a construction SME in Singapore. Specifically, we ask the following questions:

RQ1: How was a proprietary mobile management software designed in-house and implemented?

RQ2: What was the process of implementing the mobile software in the workplace?

RQ3: How did the organisation and its employees negotiate the adoption and use of the new software collectively and individually?

Technology Domestication

This study draws on technology domestication theory (Silverstone et al., 1992) as an interpretive framework for understanding the dynamic process of technology implementation in organisational contexts. Domestication is a metaphor describing the process of bringing unfamiliar technologies from the public realm into the fabric of private life (Berker et al., 2006; Morley & Silverstone, 1990; Silverstone et al., 1992). The domestication of new technology usually spans a long period, and manifests varying degrees of success in being completely "tamed". This is a dynamic process involving more than mere adoption but rather "negotiated reciprocity" between the user and the technology in which the user "tames" the technological artefact for his/her own needs, while the technology manifests its capability to shape the technological and sociocultural environments it inhabits (Livingstone, 1992; Silverstone et al., 1992; Sørensen, 2006; Ward, 2006).

The technology domestication framework posits that the implementation of new technology usually goes through four phases: appropriation, objectification, incorporation, and conversion (Silverstone & Haddon, 1996; Silverstone et al., 1992; Sørensen, 2006). *Appropriation* is a "preadoption" phase that happens before the technology is introduced into the user's private space from the market. In this stage, the user becomes aware of the functions and symbolic meanings of the technology, and begins to evaluate its fitness and usefulness for his/her needs before making the final decision of purchase and adoption. The user also tends to imagine the new technology in relation to his/her existing life environment, so as to plan the possible physical locations, use routines, as well as potential tensions and conflicts that may be brought about.

Once adopted, the new technology is spatially and temporally integrated into the sociotechnical settings of the user's daily life, referred to as objectification and incorporation. *Objectification* describes the spatial dimension of domestication, focussing on issues about how the technological artefact is physically displayed in the household, as well as the user's particular purposes of making these spatial arrangements. For example, previous domestication research has discovered that parents tend to locate computers or laptops in communal areas of the home, such as the living room, so as to easily monitor their children's screen time (Lemor, 2006; Lim, 2006).

Incorporation portrays the temporal dimension of domestication in which the new technology and its functionalities are integrated into the user's quotidian routines and become an indispensable element of everyday life. For example, household information and communications technologies, such as the television, home computer, and game console, are often considered as "digital hearth" (Flynn, 2003) in the domestic sphere which encourages collective activities of family members (Flynn, 2003; Lim, 2006; McDonald, 2015).

In the final phase of *conversion*, the "domesticated" technology is inscribed with personal meanings and in turn, articulates the user's values and identities to the external world. Specifically, after the technology has been fully domesticated, it has been reconfigured according to the user's unique preferences and meanings, thereby becoming a symbol of his/her values, competences, and identities. Therefore, when the domesticated technology is displayed to the public, it serves as a medium to represent, perform, and communicate the user's values and identities to other people. For example, the ownership and intensive, skilful usage of mobile phones is often taken as a status symbol by young people to earn acceptance and popularity within their peer groups (Green, 2003; Lim, 2006).

In many real-world cases, the ideal four-phase linear framework is often replaced by dynamic and "deviant" processes in which the user may stop halfway, skip or repeat a particular stage, alter the sequence of stages, or develop unique and creative steps in integrating the new technology (Hynes & Rommes, 2006; McDonald, 2015; Quandt & von Pape, 2010; Ward, 2006). For instance, in their study involving participants of introductory courses in computers and the Internet, Hynes and Rommes (2006) illustrated a momentary and nonlinear domestication process wherein many participants exhibited intensive computer use during the course but ceased to use computers soon after the courses had finished. Quandt and von Pape (2010) challenged the notion of a clear-cut series of stages during the domestication process, and underscored the reality that the phases often overlap with each other in time, with the meanings,

values, and usage of the technology being continuously transformed by the user, environment, and technological characteristics. Therefore, the stage classification is better considered as a conceptual framework for understanding the potential career of the technology from a commodity to an indispensable element of the user's daily life, rather than a predefined and rigid pattern of domestication.

Technology domestication theory was originally developed to analyse technology adoption and use in the household environment, but it has also been widely applied in various other contexts including organisational and workplace settings (e.g., Harwood, 2011; Pierson, 2006; Sørensen et al., 2000). In the workplace, technology domestication is a collective undertaking in which the organisation and its employees have to reach a consensus around why and how the technology should be used and be prepared to negotiate tensions arising from conflicting expectations and use experiences (Adriaanse et al., 2010; Harwood, 2011; Pierson, 2006). The domestication framework eschews technological determinism by foregrounding the active role of users in defining and shaping their own technologies (Bakardjieva, 2006; Frissen, 2000; Silverstone & Haddon, 1996; Sørensen, 2006), which offers a productive lens to investigate the complexity of collective sense-making and multistakeholder negotiations underlying workplace technology implementation processes.

Research Methods

Research Site

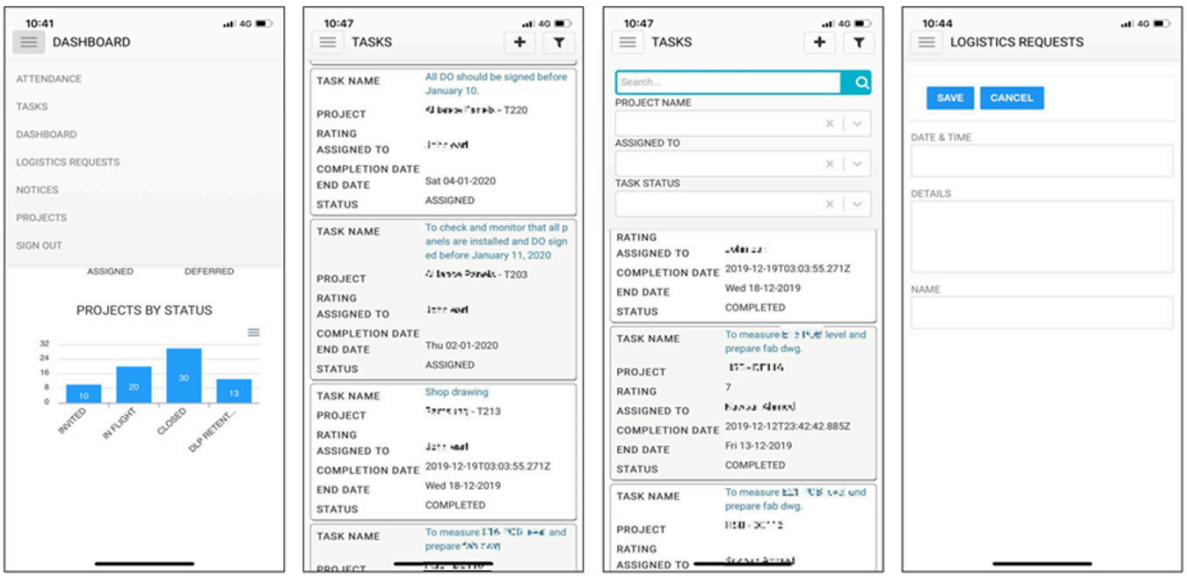
The research site was a construction SME in Singapore—ABC (pseudonym)—that designs, fabricates, and installs customised stainless steel products. Led by its CEO, it employs 22 people, comprising 10 in office-based positions covering engineering, architecture, quantity surveying, procurement, sales, human resources, and finance functions. Like many SMEs, ABC's small size means that individuals undertake multiple office functions and job roles. The engineers and architects manage a team of 12 welders, fabricators, installers, and drivers working on the shop floor and on-site to fabricate and install their products. They are also cross-trained and certified to perform multiple roles and be deployed across projects. The company works on both large and small projects as main- and sub-contractors for public and private industry clients, providing services ranging from product design and customisation to fabrication and installation. ABC has experienced consistent year-on-year revenue growth and expansion in its 10 years of operation.

Innovative Mobile Management Software

When fieldwork commenced, ABC had just introduced a mobile management software named myABC (pseudonym), the key focus of our study. This integrated project management software was adopted by all employees and developed in-house with an external software developer. It unifies organisational functions and work tasks in a single platform and can be accessed via a mobile app or web app on computers, which means that employees can access the software remotely anytime. All employees, including shop floor workers, use myABC daily for basic functions such as attendance taking, task allocation and assignment. Office staff access additional functions such as task and project monitoring, checking and generating purchase orders and invoicing, and operational and material costs, alongside functions such as salary information and financial reporting capabilities. Since its initial rollout, the software has been further customised and enhanced with new features based on employees' inputs. Recent additions include a filter function that can sort information by project or company name. Project information can therefore be tracked in the application, including "in-flight" projects that are currently in progress versus completed projects. Purchase orders, quotations, and invoices are created directly from the application and saved in the company's online cloud storage drive. Information from past projects (e.g., costing and revenue) is also accessible through the application (Figure 1).

Figure 1

User Interface and Some Functions of myABC



In April 2020, the Singapore government imposed a two-month lockdown to slow the spread of COVID-19. Besides companies providing essential services, all others, including ABC, ceased their onsite operations and required employees to work from home. Consequently, ABC's shop floor workers were furloughed till June 2020 while all office employees worked from home using myABC.

Ethnographic Fieldwork

We employed an ethnographic approach to gain in-depth insights into the process of implementing myABC and employees' experiences during this process. Relying on an extensive period of immersive fieldwork in the participants' indigenous life work contexts, ethnographic research has proven to be especially effective for capturing rich, contextualised information and uncovering significant yet overlooked nuances of the target culture (Hammersley & Atkinson, 1995; Maton, 1993). For this study, we employed multiple ethnographic methods including participant observation, in-depth interviews, focus group discussions, and diary recordings to grasp the nuanced occurrences and their meanings involved in the complexity of technology domestication in relation to the workplace and organisational contexts. Six researchers collected ethnographic data during site visits to the office and shop floor from December 2019 to January 2020. We also conducted a follow-up interview with the CEO in September 2020 to discuss the impact of COVID-19 and the shift to remote work during the lockdown. Our data collection, storage, analysis, and dissemination methods were approved by the University's Institutional Research Board.

During the fieldwork, we conducted semi-structured interviews with the CEO and office employees and ran focus group discussions with shop floor workers. The interviews and focus groups lasted between 40 minutes and 60 minutes, and covered topics including the process of developing and implementing myABC, daily use routines of myABC and other work-related technologies, attitudes to myABC, and the organisation's digital transformation progress, perceived changes in work processes, as well as perceived benefits and challenges in relation to the implementation of new technologies in the workplace. We also asked about the SME's overall digital transformation visions, workplace culture, as well as background information such as the organisational structure and employees' job roles. After the pandemic lockdown, a follow-up interview with the CEO was arranged to glean insights into the role of myABC during remote working. All the interviews and focus groups were audio-recorded and transcribed verbatim for analysis.

Observations were conducted on both the workplace and at different organisational levels. Workplace-level observation mainly took place at early stages of the fieldwork when the researchers extensively observed and familiarised themselves with the company's social and technological environment. Key aspects included observations of the organisational structure, spatial settings of the office and shop floor, work and project schedules, employees' job roles and work tasks, workplace coordination and communication, technologies deployed for work, and so forth. The researchers also informally talked to the CEO, office employees, and factory workers, and took photos of the workplace environment and technologies. Individual-level observations aimed to gain in-depth insights and employee perspectives on their day-to-day technology use and experiences. Selected employees were shadowed by a researcher over several hours to observe their work routines and technology use practices, with particular focus on their use of myABC. A researcher-administered '"Task-Technology Diary" was employed to record the participants' technology use in relation to specific work tasks, contextual information, and subjective experiences (see Figure 2).

Figure 2

An Example of the Task-Technology Diary

TIME	PARTICIPANT	WORK TASK	TECHNOLOGY	WORKPLACE CONTEXTS	EXPLANATIONS/ REFLECTIONS
About 1:40pm-2:20pm	03E	· Fetch his smartphone from his desk -> start to browse and reply messages	· Smartphone	· In the 'meeting room' (accountant's office) · During the interview	
1:57pm	03E	· Answer a phone call	· Smartphone	Same as the above	
2pm	03E	· Answer a phone call	· The landline phone	Same as the above	· Employees in the office can transfer phone calls (on landline) to each other
2:25pm-2:35pm	03E	· Generate purchase order in the company system	· PC · Purchase order function and an auto-generated purchase order *(Figure)* · Create new quotation *(Figure)*	Same as the above	· Appreciate the system – time-saving, emancipate them from messy manual work (e.g., calculation, generating purchase order).
10:26am - 10:30am	03E	· Send email to a contractor with his drawing (under the reminder of the CEO)	· PC – email · Attached his drawing (pdf) with the email · Browse the drawing before attaching and sending	· Same as the above · The CEO and the QS discussing about a project at another side of the office	· For each project, he has to send his drawing to the contractor for feedback before proceeding to fabricate. This sometimes needs several rounds.

The number and duration of individual observations varied according to the participant's job roles and schedules, mostly ranging from one to three observation periods that lasted between two hours and five hours. These took place in various workplace settings such as the office or shop floor, projects at external sites (e.g., installation), as well as during breaks. The researchers generally took a passive role to minimise disruptions to participants' workflow, and only sought clarifications and probed into details during the participants' free moments. With the participants' permission, the researchers also took photos or screenshots of relevant digital devices and software. Brief profiles of the main informants who participated in individual in-depth interviews and/or individual-level observations are included in Table 1.

Table 1

Brief Profiles of Main Informants

ID	Name/ID	Gender	Job Position	Research Participation
1	Kevin	Male	CEO	Interviews (3 times)
2	Alan	Male	Engineer and Architect	Interview and observation
3	Joseph	Male	Engineer and Architect	Interview and observation
4	Simon	Male	Procurement and HR	Interview and observation
5	Daisy	Female	Quantity Surveyor and Sales	Interview and observation
6	Ian	Male	Shop Floor Supervisor	Observation

Note. To preserve anonymity and confidentiality, all names of the respondents are pseudonyms.

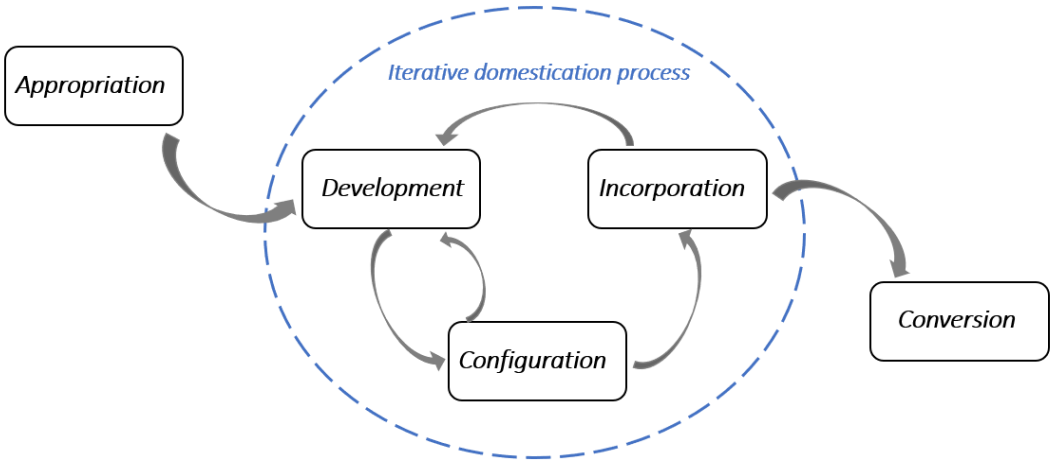
Qualitative data (i.e., interview transcripts, field notes, diary entries, and photos) were analysed through open coding with NVivo following the grounded theory approach (Lindlof & Taylor, 2011; Strauss & Corbin, 1998). The data analysis was informed by technology domestication theory, where we paid special attention to themes relating to different stages of technology implementation as well as the interplay between the technology, user, and environment during the domestication process. The findings derived from the data analysis process are presented and expounded upon in the subsequent sections of this paper.

A Five-Stage Framework of Technology Domestication in the Workplace

Findings from this case study show that myABC had been fully domesticated into the work environment of ABC and used by all the employees, which dramatically enhanced work productivity and flexibility in the SME and facilitated a smooth transition into remote working during the COVID-19 pandemic. Building upon the classic four-stage technology domestication process (Silverstone & Haddon, 1996; Silverstone et al., 1992; Sørensen, 2006), we propose a five-stage workplace domestication framework that captures the iterative and ongoing process of ABC's technology implementation (see Figure 3 for illustration). The five-stage domestication process starts with the *appropriation* and *development* stages which happened before myABC entered the workplace, to *configuration* and *incorporation* stages through which myABC is integrated into the workplace contexts, and finally the *conversion* stage where meanings and values derived from domestication were conveyed publicly beyond the organisational boundary.

Figure 3

Technology Domestication Process in the Organisational Context



As depicted in Figure 3, rather than conforming to the linear and irreversible process as portrayed in the prototype four-phase domestication model, the domestication of myABC exhibits an iterative, reversible, and open-ended process in which the phases of development, configuration, and incorporation occur cyclically. Throughout the ongoing domestication process, these three phases were revisited multiple times, with the adoption of the software, or certain functionalities, reverting back to earlier phases at times. The novel stages of development and configuration introduced in this framework, which are unique to the implementation of customised, in-house-designed, and open-ended technologies, highlight the dynamic and negotiable nature of technology domestication that has hitherto been understudied.

During the process of workplace technology domestication, a participatory culture was witnessed throughout all these stages where the CEO, office employees, shop floor workers, and the developer team interacted with one other to negotiate different expectations, experiences, and attitudes towards myABC and the changes it ushered in. While the implementation of myABC was largely a smooth experience characterised by high levels of employee acceptance, support, and participation, a degree of silent and passive resistance in the form of incomplete adoption of technological functions was observed among some employees. In the subsequent portion of this section, we will elaborate on each stage of the domestication process.

Appropriation: The "Preadoption" Stage

ABC's digital transformation journey starts with the stage of appropriation when the CEO came to realise the significance of digitalisation and saw value in adopting new technologies to transform their outdated work processes. In accordance with the domestication process advocated by technology domestication theory (Silverstone et al., 1992), the appropriation process was characterised by thorough evaluation and imagination about the potential usefulness of the new technology and its impacts on the workplace. In this stage, the organisation and its employees engaged in collective decision-making regarding whether and why the company needed to adopt a management system, what applications they could consider, and how it could benefit the organisation or disrupt existing job roles and work tasks. This stage was mainly driven by the CEO, who recognised the value of incorporating technology to enhance work processes and communicated his vision to the employees. In turn, the employees reconciled and contributed to refining the blueprint conceived by the CEO.

Inspired by the feedback of a visiting expert, the CEO became aware that his company was disorganised with outdated processes and required further digitalisation and standardisation to enhance productivity. After evaluating the potential affordances and benefits of various technologies, he, along with the employees, decided to adopt a management platform that could integrate as many aspects of the company's workflow as possible, including administration, paperwork, project and task management, and logistics. Instead of adopting an off-the-shelf software, the company opted to engage an external team to develop a customised application, which was more cost-effective for an SME. Off-the-shelf software were generally pricier and did not meet their specific needs as they were either too specialised or included unnecessary functions or excessive functionalities to be fit for ABC's purposes. In contrast, a customised application allowed them to integrate all critical functions onto a single platform at a reasonable cost. The customised myABC also enabled employees to continually shape and improve the technology as needs emerge, rather than disrupting existing work routines to accommodate the new technology. As the CEO commented:

> The large (software) suppliers make a lot of money but doing all of this separately. But for me, I design, my friend developed, I put everything inside, put everything together, so we don't have to use a lot of software to do this and pay a lot … If we need anything, we just ask the IT guys to update (the software). We haven't got a beautiful design now, but we have a package with a bundle of all functions we need.

Development: Iterative Design and Refinement

After appropriation came development, a stage in which myABC was designed, developed, and tested. It is a novel dimension of technology domestication that is unique to in-house-designed, customised technologies, therefore has not been investigated in previous domestication studies that mainly focus on off-the-shelf technologies. During the development stage, ABC worked closely with an external developer team to design and configure myABC, which involved real-time discussions and negotiation between the SME and developers regarding the app's layout, functions, as well as optimal solutions to technical challenges.

The development of myABC was guided by four explicit notions. First, the software should be comprehensive enough to integrate and standardise all the key administrative functions in relation to the company's projects and work processes while avoiding redundant functions that may result in unnecessary costs or procedures. Second, the software needed to be accessible via either mobile application or web browsers and able to function smoothly across varying digital devices and operating systems. Third, myABC required a multilevel access mechanism where different employees could access different functions and information based on their roles and responsibilities in the company. Fourth, all the functions should be simply designed and easily accessible to all employees, including the less tech-savvy.

Development was not a one-off process that occurred only before myABC was introduced into the workplace; instead, it was an iterative and recurrent stage that unfolded throughout the entire domestication cycle (as illustrated in Figure 3). Following the initial version of myABC, which only included basic functions of task assignment and tracking, project summaries, and generating purchase orders, the software redevelopment and iterations were informed by on-the-ground implementation and used in the next stages of configuration and incorporation. Whenever a revision or upgrade to the software was suggested by the SME during the later stages, the domestication process reverted to the development phase. For example, recognising the need to systematically record employees' attendance and workloads, the CEO requested the developers to create an attendance function. Similarly, in response to employee feedback on the time-consuming nature of manual information entry, the purchase order function was redeveloped to enable the automatic generation of templates. Simon, the procurement and HR of the company, described his real-time coordination with the developers and expressed his appreciation for the developers' responsiveness:

> Whenever we face any difficulty, or we think that if the developer team add this one it will be easier for us, we inform [them] directly. They are very fast, the guys who develop the system for us. They start to work with that soon … And very fast, usually within one week, they came up with a conclusion.

In the company's coordination and negotiation with developers, the CEO performed the role of a broker who collected feedback from employees and directly communicated with the developers on an ongoing basis. He recognised the value of employee participation and encouraged all employees to voice their requirements and provide feedback and suggestions for improving the software based on their daily use experiences. In his own words, the best approach to software design is "design with the employees, rather than design for the employees". Employees of different job roles had diverse needs and perceptions, enabling them to identify deficiencies in the software that the management and developers were unaware of.

Configuration: Intraorganisational Preparation Work

The next stage of domestication, configuration, describes the trial-and-error preparation work before day-to-day, stable use of the technology in the company. It is another novel dimension of domestication that is particularly significant for customised, self-designed technologies. During the configuration of myABC, the necessary technological infrastructures were set up and employees developed consensus about how to appropriately use the software and how to improve its functions to better suit work requirements. As with development, the configuration process occurred recurrently and continually, not only during the initial launch and integration of the software into the workplace but also each time the software underwent

functions added or existing functions revised. Successful configuration paved the way for smooth and efficient use of myABC in the next stage of incorporation, while problematic or unsatisfactory configuration (e.g., technical issues, missing functions) reverted the domestication process to redevelopment and redesign before advancing to the next round of configuration (as depicted in Figure 3).

In the configuration stage, technological infrastructures were established and all employees were required to familiarise themselves with myABC and/or its features. For instance, when myABC was first launched, the company provided smartphones to employees who did not own one and taught them how to install and use the application via tutorial videos produced by the CEO. Additionally, during each round of configuration, the company had to make sure myABC could function smoothly across different digital devices and versions of operating systems, and approached the developer team for troubleshooting whenever a technical issue is identified.

Apart from setting up technological infrastructure, configuration also involves integrating the software into the company's workflow. The company and its employees needed to adapt to new work routines in which roles, processes, and tasks were transformed with the launch of myABC. For example, attendance of workers, which used to be taken by signing the physical timecard, was moved to virtual updates in the software. Despite the attendance logging being very easily mastered with only several clicks on the phone, it took some time before all the shop floor workers formed the habit of doing attendance every morning without reminders from the engineers or supervisors.

Akin to the development stage, the configuration was an iterative, ongoing process. The company and its employees continuously experimented with different ways to use myABC and provided feedback to refine the software. For instance, during the trial usage of the software in an early round of configuration, Daisy, the quantity surveyor and sales staff of ABC, noticed the absence of a calculation function and requested an upgrade to the software to address this deficiency. As a staff member responsible for preparing quotations on a daily basis, Daisy acutely identified the anticipated benefits of replacing the existing manual calculation with automated calculation using the software, confidently expecting a more efficient, timesaving, and error-free work process. Her proposal was well supported by the CEO and promptly reported to the developer team, initiating a new round of iterative development and configuration aimed at enhancing the domestication experience. As Daisy remarked:

> Before (having the app), I have to spend many hours to finish the quotation. The calculation, although we have the Excel, sometimes I do wrongly. But now so easy. I just do all the things in the app … This calculation function is a recent one. This new app is revised to add the calculation function, just this year … My boss takes our ideas, especially the technical matters. The trust of my boss really makes me feel better, and makes me feel confident to do my work.

As demonstrated in Daisy's narratives, the CEO played a crucial role in cultivating a supportive culture that encouraged active employee participation and proactive thinking throughout the domestication process. In particular, he granted employees high autonomy to engage freely and continuously in improving myABC for their own benefits, remaining responsive to any novel insights and suggestions stemming from employees' unique work experiences. This supportive stance not only facilitated active acceptance and adaptation to the software within the organisation but also enhanced organisational belonging and confidence to professional life.

Incorporation: Negotiation of Contextualised Use in the Workplace

In the incorporation stage that follows, the new technology or new functions had been woven deeply into the fabric of ABC's daily work processes and became indispensable to the organisation and its employees. By the time of our fieldwork in the company, the employees had developed a mature repertoire of work routines revolving around myABC. Macrolevel project management on myABC was complemented by micro-coordination via other approaches such as WhatsApp chat groups, emails, phone calls, Google Drive, as well as face-to-face interactions in the workplace. For instance, during an observation session, Simon completed a purchase

order for a new project on myABC alongside the use of phone calls, information searching in WhatsApp groups, and on-site communication with colleagues to confirm details (see diary excerpt in Figure 4).

Figure 4

Diary Excerpt of the Procurement Staff's Daily Work Routines

TIME	PARTICIPANT	WORK TASK	TECHNOLOGY	WORKPLACE CONTEXTS	EXPLANATIONS/ REFLECTIONS
10.15am	03E	- Filling and checking of *Raw Material Request Form* (hard copy) - Checking with purchase order prepared via myABC	- Desktop computer, **myABC** software (purchase order function)	- Very noisy environment	- One question is why there is so many Raw Material Request Form that is on paper - This then has to be uploaded or keyed in with the system
10.20am	03E	- On the phone with the suppliers to confirm the order - Looking at the WhatsApp group chat to review the invoice	- Landline phone - Smartphone, WhatsApp chat groups		
10.22am	03E	- Make the purchase order in the system	- Desktop computer, **myABC** software (purchase order function)	- Referencing the report on another tab	
10:33am	03E	- Sending a file to the CEO upon his request	- Smartphone, WhatsApp		
11:08am	03E	- Keying in of purchase order again	- Desktop computer, **myABC** software (purchase order function)	- Asked the CEO about the task of sending PO for project	
11:08am	03E	- Heading to the myABC system using the phone instead (It looks like he was searching for the project name or detail)	- Smartphone, **myABC** app (project/ task-related functions)	- Checking with the CEO on how to fill in the request quotation	- Having a small office is to their benefit
11:23am	03E	- Googling pictures of steel anti-ram bollard, as quoted by clients (via email) - Check WhatsApp for relevant information	- Desktop, email - Smartphone, WhatsApp		
11:50am	03E	- Filling in of purchase order on system	- Desktop computer, **myABC** software (purchase order function)	- The whiteboard with the inflight projects is placed in view of office employees	- Project name and supplier name is already in the system, keying in of items is in reference to the Raw Material Form

The successful incorporation of myABC was described as a "game changer" by the CEO and employees, as it dramatically transformed processes, tasks, and relationships in relation to work within ABC in several significant ways. First, by automating and standardising administrative and logistics work, myABC relieved employees from manual and repetitive tasks and enabled more efficient task allocation, coordination, and project management in the workplace. For example, auto-generation of official documents, such as quotations, purchase orders, and reports, saved considerable time and increased the accuracy of the information contained in the documents. As Daisy highlighted, "just two clicks, in a second, you can see everything about all different projects".

Second, myABC enhanced workflow and information transparency, thereby facilitating shared awareness and collaboration among employees. With myABC in place, every employee was able to stay up to date on the progress of all ongoing projects and activities, while also contributing to the work stream by creating and/or editing tasks on a continuous basis. Compared to previous fragmented and disorganised coordination in WhatsApp chat groups, myABC also enabled systematic storage and convenient searching of project and task details for both ongoing and closed projects. This collaboratively built workflow, along with the traceability of work-related information, allowed employees to acquire contextualised knowledge about broader organisational processes and more appropriately locate their roles and responsibilities within the company.

Third, the fully incorporated myABC enabled employees to manage administrative and office-based work tasks (e.g., quotations, accounting, and drawing) outside of the workplace, which facilitated the company's smooth transition into remote working during and in the aftermath of the pandemic lockdowns. Compared to peer companies that were caught off-guard by the pandemic due to a lack of digitalisation, ABC demonstrated adaptability and resilience in the face of changing work conditions since critical technological infrastructures were already in place.

Despite ABC having established stable work processes surrounding myABC in the incorporation stage, divergences and negotiations existed within the company in relation to differential use routines and the degree of reliance on the software. Most prominently, many employees did not use the software to its fullest potential as initially expected by the CEO. Workers on the shop floor, for instance, used only limited functions such as attendance taking and notification, while continuing to rely on handwritten updates on a notice board for the latest project and task information. Similar selective incorporation was also observed in how office staff clung to traditional paper-based work habits for some tasks that had already been digitalised on myABC. For example, Joseph, an engineer and architect, was observed to frequently refer to paper-based checklists of pending tasks and prepare material lists using pen and paper (see diary excerpt in Figure 5) instead of referring to the task- and material-related information in the software.

Figure 5

Diary Excerpt of the Architect's Paper-Based Work Tasks

TIME	PARTICIPANT	WORK TASK	TECHNOLOGY	WORKPLACE CONTEXTS	EXPLANATIONS/ REFLECTIONS
10:03am	04E	· Check pending work tasks with the app and hard-copy checklist	· Smartphone – the company app, Project function · Hard-copy checklist – compiled with excel and print out	· In the office, at his desk · Five employees working in the office	· Although all the tasks are in the company system, he still prefers to also prepare a hard-copy task checklist at hand. The checklist is updated about once a week. Whenever a task is done, he will cross it out.
11:22	04E	· Check the work task checklist · Add notes to some tasks · Check two tasks		Same as the above	· Prefer checklist over the system at work because he doesn't want to always check on the phone during work
11:25 onwards	04E	· Draft the material list according to drawing from the client · Print out the drawing and calculate/ list on the hard copy · Calculation and list materials on the drawing of the project	· Printer – print out the drawing · PC – photo: refer to the drawing on the PC when calculating, adding notes and listing materials on the hard-copy drawing · Calculator	Same as the above	· He keeps softs copies of the raw material request forms for every project, and the purchase staff keeps hard copies for official use (e.g., ISO assessment)

Joseph's case exemplified that the full integration of new technology into work routines is often a complex and protracted process, characterised by the occasional unconscious presence of inertia in altering existing nondigital work habits. During our interviews with Joseph, he asserted a complete incorporation of and heavy reliance on myABC across a wide range of tasks, basically "using it for everything" in his own narratives. Nevertheless, close observation of his daily work routines revealed an evident retention of preference for traditional paper-and-pen approaches for task management, calculation, and more. As Joseph explained, he sometimes felt more comfortable with his old habits which had persisted for decades and were not easily replaced by digital means overnight.

Divergences also prevailed in terms of different attitudes towards and perceived benefits associated with using myABC, which were most evidently observed between office staff and shop floor workers. While the office staff generally expressed strong appreciation for the software and actively used it to perform a wide range of work responsibilities, shop floor workers tended to adopt the software passively, only using it for mandatory tasks (e.g., attendance) as stipulated by the CEO. In addition, office staff showed enthusiasm for refining myABC to further improve work processes, while workers were inclined to regard the new software as dispensable and lacked the motivation to change their work habits to accommodate it.

Similar to the configuration stage, incorporation was also an ongoing process that recurred as myABC underwent upgrades with new or revised functions. Employee feedback deriving from situated use and negotiation in the workplace was in turn reported to the developers in real time to inform the next redesign and development cycle (as illustrated in Figure 3).

Conversion: Building Organisational Identity and Social Reputation With Technological Innovations

The final stage of conversion took place after myABC had gone through several rounds of the development-configuration-incorporation loop and became inscribed with organisational meanings and values during day-to-day use. In this stage, the fully domesticated myABC became a symbol of ABC's entrepreneurship, morale, and digital competency, conveying the organisation's values and visions to the public and enhancing the company's reputation within and beyond the industry.

With the domestication journey progressing to conversion, the implementation of myABC had generated discernible improvements in work quality and efficiency among the employees, leading to a universal enhancement in job satisfaction and confidence. Additionally, through intensive engagement and interactions surrounding the ongoing configuration and incorporation of myABC, a shared organisational identity was forged as employees increasingly felt themselves playing a significant role in the organisation and being supported by their boss and peers. Further strengthening employees' organisational commitment was the sense of pride and accomplishment derived from the company's outstanding achievements in venturing into technology development and implementation. During the fieldwork, all employees exuded pride when talking about myABC, which represented a high level of digitalisation far ahead of their peer companies given the economic and industrial constraints faced by construction SMEs.

Successful domestication of myABC also gave ABC a competitive edge when collaborating with external parties. Representing ABC's entrepreneurship and innovative digital mindset, myABC served as the company's "business card" that exhibited the organisation's image, values, and digital transformation vision to external stakeholders. Specifically, their clients were impressed with the company's high work quality and efficiency enabled by the innovative software, which contributed to strengthening partnerships and expanding their scope of business. Taking one step further, the conversion of technology domestication experiences also provided new opportunities for business and social outreach. Prior to the COVID-19 pandemic, the CEO had expressed intentions to commercialise myABC to benefit other SMEs that cannot afford costly and sophisticated software in the market. The developer team made efforts to improve its functions, layout design, and security settings so as to offer comprehensive and customised services according to different companies' requirements. In the initial interview, the CEO shared his vision of commercialisation for broader use:

> I'm planning once all these (functions) there, we have packages like a bundle of everything, then we do marketing. It doesn't take a lot of time to reproduce. Just the same thing you sell to other people, just prepare the company name and everything … Money is not everything. We see [it as] kind of contributing to the society also, right? Yeah, you still make fair profit but it is important to help the community.

By late 2020, ABC had realised this blueprint by incorporating a new company that provides tailored solutions for developing enterprise websites and management apps at a reasonable cost for SMEs. So far, the team has brought several SMEs on board to develop their own software and/or website to achieve more organised workflow management and create a more attractive online presence. During the COVID-19 lockdown, the experience gained in developing and using myABC was channelled into developing a community app to provide support for foreign workers stuck in quarantine. This app provided resources and services, including free food and grocery deliveries, passport renewals, information sharing and exchange, and so forth. Due to their significant contribution to the industry, community, and society, these initiatives won ABC and its CEO a series of national honours and awards and helped the company further solidify its reputation as an innovator.

Influential Factors of Workplace Technology Domestication

In the collective effort of integrating myABC into organisational settings, the trajectory and outcomes of domestication were shaped by a constellation of technological, individual, organisational, and extraorganisational factors. These factors prompted the emergence of some technology-use routines, approaches, and meanings while constraining others, which either propel or impede domestication.

Technological Factors

Ease of Use

myABC encompassed only a limited scope of highly relevant functions and each function was designed to be concise and straightforward to guarantee its high ease of use. During configuration and incorporation, ease of use and low skill requirement ensured its effortless adoption and use by all employees, including the relatively less-educated workers. This contributed to the smooth and swift integration of the new technology into organisational workflow.

Resource Commitment

Resource commitment describes the necessary investment of resources in terms of financial costs, technological infrastructures, and manpower during technology adoption. For SME ABC, developing and implementing myABC required minimal digital setups and manpower, which facilitated employees' efficient adaptation to the changes brought by the new technology. Moreover, low resource commitment also became a powerful selling point to commercialise the software during conversion.

Flexibility and Malleability

The possibility of flexibly and iteratively adapting technological functionalities in response to contextual use experiences was considered one important advantage of a self-developed software like myABC. During configuration and incorporation, myABC manifested high levels of flexibility and malleability to evolve its functions to emerging organisational needs, contributing to employees' fast adaptation to and heavy reliance on the software. When it came to conversion, flexibility and malleability became yet another selling point of the software development service well received and welcomed by the clients.

Organisational Factors

Organisational Structure and Culture

In the small-size company of SME ABC, the workplace environment was characterised by physical proximity of staff, overlapped job roles, seamless coordination for work tasks, as well as strong organisational cohesion and commitment. Such organisational culture on the one hand guaranteed the top-down consensus about organisational goals of adopting myABC, and on the other hand, also granted employees high autonomy to engage freely in designing and configuring the new technology for their own benefits. In particular, the positive organisational culture and strong workplace cohesion encouraged high levels of employee participation in software design and facilitated the emergence of shared meanings and appropriate role allocation surrounding myABC.

Leadership Behaviours

Effective leadership was another important driver behind the successful domestication of myABC. For SME ABC, the CEO's entrepreneurial and strong commitment to digital transformation effectively facilitated various domestication processes including organisational

decision-making, collective goal setting, employee engagement, cultivation of digital culture, and more. Most importantly, throughout the iterative development and configuration of myABC, the CEO took a leading role in cultivating a supportive digital culture, soliciting novel ideas and feedback from all employees, and remaining encouraging of any innovative trial and errors. This enhanced employees' interest in adopting the software and prepared them for the potential changes to work processes it heralded.

Economic Constraint

Economic constraint is a fundamental restrictive factor affecting the choices and experiences of technology domestication by SME ABC and many other SMEs alike. Limited budget prevented ABC from investing in costly management software, sophisticated functions, and a polished layout, prompting the company to pursue the simplest software with only limited and the most necessary designs. Whereas the limited functionality became a special edge in the conversion stage where the simple design and corresponding affordable price rendered their software development services and products highly cost-effective, as evaluated by their potential clients.

Individual Factors

Perceived Benefits and Challenges

The degree to which one believes that using a new technology could improve or undermine work experiences is an important factor affecting whether and how the technology is adopted. During the implementation of myABC, employees with higher expectations to the software for enhancing work efficiency tended to engage more actively in providing ideas for software (re)development. Similarly, employees who experienced beneficial outcomes of using myABC (e.g., ease of generating e-documents and organised task management) demonstrated strong enthusiasm in incorporating myABC deeper into their work. In contrast, those who perceived myABC as generating unsatisfactory work experiences (e.g., additional work required when having to create tasks online) showed reluctance to use the software as their primary means of work.

Perceived Alignment With Existing Work Habits

The degree to which the features of myABC matched employees' established work habits affected their efficient use of the software. Whilst developing myABC in-house ensured its high alignment with the company's general workflow and requirements, it did not necessarily fit seamlessly with the work habits of every employee. When myABC or its certain features diverged radically from an employee's habitual work practices and/or required disruptive changes to workplace environment, an incomplete domestication or even resistance might emerge. For example, for some shop floor workers, virtual updates of project and task information did not fit well into their manual fabrication work routines and face-to-face communication habits, which resulted in limited use of myABC at work. Such inertia to change existing work habits was also observed amongst employees who showed an overall high level of adaptation to the new technology. In the aforementioned case of Joseph, for instance, albeit heavily reliant on myABC for most work routines, he clung on to his customary paper-based working habits even when these tasks could be done quickly and more accurately in the system.

Extraorganisational Factors

Digital Support and Partnership

External partnership and available support for digital transformation could make a difference to whether and how a new technology is integrated into the organisational context. During the domestication of myABC, SME ABC obtained support from a variety of external bodies, including

the outsourcing developer team, industrial associations, as well as government agencies, which contributed to successful domestication.

Industrial Digitalisation Progress

The low degree of digitalisation in SMEs generally in Singapore's construction/manufacturing industry was a major impediment to the domestication of myABC. In particular, some partner organisations and clients still relied on traditional hard copy rather than electronic documents and cheques versus online banking, which restricted SME ABC's ability to integrate all work processes in the new system. Further constraining the full domestication of myABC was the persistence of non-digitalised industrial culture and the work procedures. For example, as the IOS protocol required hard-copy documents (e.g., Raw Material Request Forms) of every project for yearly auditing and assessment, the company had to retain the paper-based portion of work even though it could be easily digitalised.

Discussion and Conclusion

In this paper, we present an in-depth case study of implementing a mobile management software in a construction SME, drawing on technology domestication theory as the main interpretive framework to understand the dynamic process of workplace digital transformation journey. In accordance with previous research, the domestication process includes the mutual construction of the technology and the user (see also Bakardjieva, 2006; Livingstone, 1992; Silverstone et al., 1992; Sørensen, 2006). On the one hand, the SME continually reconfigured and creatively deployed the newly introduced technology to meet organisational and employee requirements. On the other hand, the effective integration of the software also required drastic changes to employee work habits, organisational coordination routines, and performance expectations.

Findings from this study contribute to the theoretical understanding of the technology domestication framework and the literature on workplace digital transformation in several significant ways. First, by crucially engaging with extant domestication research, we identified a five-stage workplace technology domestication process that the organisation underwent to develop a customised technology from scratch and integrate it into organisational workflow. Building upon the established four-stage domestication model (Silverstone & Haddon, 1996; Silverstone et al., 1992), our five-stage framework introduces the novel stages of development and configuration to capture the dynamic processes in which technological functions are designed, developed, and refined, which remained understudied in prior domestication studies. Specifically, adding the development stage expands the scope of domestication research beyond established off-the-shelf technologies to include new and emerging digital innovations, such as customised, in-house software that is more responsive to dynamically shifting contexts. Integrating the configuration stage further augmented the explanatory power of the domestication framework by detailing the preparation and negotiation process occurring before day-to-day, stable technology use in the incorporation stage, underscoring the malleability of technologies to evolving organisational requirements.

Second, the five-stage framework presented here also challenges the existing linear domestication process. Although prior domestication research has recognised the wide existence of "deviations" from the ideal four-stage framework, such as skipping or repeating particular stages, changing their sequence, and suspending domestication midway (Hynes & Rommes, 2006; McDonald, 2015; Ward, 2006), the process was largely viewed as a linear and non-reversible process with full integration and internalisation of the technology as the expected endpoint. Our five-stage workplace domestication framework enriches our understanding of domestication by uncovering its iterative nature, whereby technology development, configuration, and usage occur cyclically and interact with each other in real time. Hence, it more accurately reflects the reality when SMEs and other organisations implement technological innovations in the workplace.

Third, this study also contributes to the burgeoning literature on workplace digital transformation by enhancing our understanding of the complex interactions and negotiations that occur between different stakeholders during the process of implementing new technologies. In the case of SME ABC, the domestication of myABC was a relatively smooth process as the software was purposefully designed to meet the SME's specific needs and tested iteratively among all the employees before its formal implementation. The concise design of the software ensured that it did not impose extra workloads to the employees and avoided the emergence of employee concerns about workplace digital surveillance and hyperconnected, always-on work culture noticed in previous research (e.g., Burchell, 2015; Shapiro, 2018; Treem & Leonardi, 2012).

Despite the absence of active resistance and antagonism, subtle forms of divergence emerged from differential expectations to the new software, as well as enthusiasm and efforts devoted in technology development. These differences varied by role and skill levels, where the CEO and office staff played a more active role in decision-making and showed strong enthusiasm in advancing the domestication process, while workers participated only at the request of management. The divergences reflected the invisible information and expectation asymmetries arising from the fact that myABC was designed to be more relevant to and beneficial for office-based work processes (see also Adriaanse et al., 2010; Shapiro, 2018). Moreover, although all the employees openly appreciated the benefits of myABC, they were observed to offer a degree of silent and passive resistance in the form of limited use of technological functions and the persistence of traditional work habits (see also Adriaanse et al., 2010; Ghobakhloo et al., 2022; Prasad & Prasad, 2000).

Apart from theoretical contributions, this study also has practical implications for SMEs in pursuit of digital transformation. Moving the focus away from the adoption of well-recognised, mature digital technologies in big corporations, we provide a valuable comparative case study on the successful development and implementation of a cost-effective, highly customised mobile management software in an SME. In the SMEs' pursuit of digital transformation, there is a conspicuous disconnection between their unique needs and the existing approaches to technology adoption (Masood & Sonntag, 2020). As shown in ABC's case, off-the-shelf digital services in the market are generally costly and overly complicated, failing to meet SMEs' specific needs and posting enormous economic, administrative, and technical challenges. By drawing on the case of SME ABC, this study offers a promising approach to achieve digitalisation of work and organisational processes with limited resources, detailing the opportunities to create and seize as well as barriers and pitfalls to circumvent, thereby benefitting SMEs at different stages of digital transformation.

Drawing from the analysis of key factors influencing workplace technology domestication experiences and outcomes, this case study also provides several recommendations to effectively manage potential tensions, divergences, and resistance among employees. First, digital technologies should be designed to prioritise user-friendliness, feature appropriate levels of skill requisites, and remain adaptable to the evolving needs and diverse requirements of different employees. Second, management is expected to cultivate a supportive digital culture within the organisation, fostering employees' enthusiasm and initiatives in technologies and motivating them to recognise and harness potential benefits arising from technology adoption. Third, management must also consider the distinct needs, work habits, and challenges of each individual employee, rather than mandating uniform routines and paces of technology adoption across the workforce.

Despite the potential theoretical, empirical, and practical contributions of this study, there are still some limitations that can be resolved or improved in future research. A discernible limitation lies in our exclusive reliance on qualitative and ethnographic methods for data collection. While ethnographic methods enable an insider's view into the workplace culture and comprehensive capturing of contextual nuances during the process of technology domestication, they fall short of investigating structural dimensions of digital transformation on large-scale samples. Therefore, further research is needed to combine quantitative methods, such as a survey, to test the relationships proposed in the exploratory framework. Moreover, the intensive ethnographic study in one single SME and its exclusive focus on the domestication of one single

mobile software determine that the width of investigation is compromised for the depth, which constrained potential representativeness and generalisability of the findings. To overcome this limitation, future research may seek to explore the domestication of various types of mobile software within diverse workplace settings.

BIOGRAPHIES

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REFERENCES

Adriaanse, A., Voordijk, H., & Dewulf, G. (2010). Adoption and use of interorganizational ICT in a construction project. *Journal of Construction Engineering and Management*, *136*(9), 1003–1014. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000201

Amoah, J., Belas, J., Dziwornu, R., & Khan, K. A. (2022). Enhancing SMEs contribution to economic development: A perspective from an emerging economy. *Journal of International Studies*, *15*(2), 63–76. http://doi.org/10.14254/2071-8330.2022/15-2/5

Anders, A. (2016). Team communication platforms and emergent social collaboration practices. *International Journal of Business Communication*, *53*(2), 224–261. https://doi.org/10.1177/2329488415627273

Atrash, A., Abel, M.-H., Moulin, C., Darène, N., Huet, F., & Bruaux, S. (2015). Note-taking as a main feature in a social networking platform for small and medium sized enterprises. *Computers in Human Behavior*, *51*(Part B), 705–714. https://doi.org/10.1016/j.chb.2014.12.010

Azarova, M., Hazoglou, M., & Aronoff-Spencer, E. (2022). Just slack it: A study of multidisciplinary teamwork based on ethnography and data from online collaborative software. *New Media and Society*, *24*(6), 1435–1458. https://doi.org/10.1177/1461444820975723

Bakardjieva, M. (2006). Domestication running wild: From the moral economy of the household to the mores of a culture. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 62–79). Open University Press.

Berker, T., Hartmann, M., Punie, Y., & Ward, K. J. (2006). Introduction. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 2–17). Open University Press.

Burchell, K. (2015). Tasking the everyday: Where mobile and online communication take time. *Mobile Media & Communication*, *3*(1), 36–52. https://doi.org/10.1177/2050157914546711

Chen, Y. Y. K., Jaw, Y. L., & Wu, B. L. (2016). Effect of digital transformation on organizational performance of SMEs. *Internet Research*, *26*(1), 186–212. http://doi.org/10.1108/IntR-12-2013-0265

Cousins, K., & Robey, D. (2015). Managing work-life boundaries with mobile technologies. *Information Technology & People*, *28*(1), 34–71. https://doi.org/10.1108/ITP-08-2013-0155

Demirbas, D., Hussain, J. G., & Matlay, H. (2011). Owner-managers' perceptions of barriers to innovation: Empirical evidence from Turkish SMEs. *Journal of Small Business and Enterprise Development*, *18*(4), 764–780. http://doi.org/10.1108/14626001111179794

Ellison, N. B., Gibbs, J. L., & Weber, M. S. (2015). The use of enterprise social network sites for knowledge sharing in distributed organizations: The role of organizational affordances. *American Behavioral Scientist*, *59*(1), 103–123. https://doi.org/10.1177/0002764214540510

Epede, M. B., & Wang, D. (2022). Global value chain linkages: An integrative review of the opportunities and challenges for SMEs in developing countries. *International Business Review*, *31*(5), Article 101993. https://doi.org/10.1016/j.ibusrev.2022.101993

Fathian, M., Akhavan, P., & Hoorali, M. (2008). E-readiness assessment of non-profit ICT SMEs in a developing country: The case of Iran. *Technovation*, *28*(9), 578–590. https://doi.org/10.1016/j.technovation.2008.02.002

Flynn, B. (2003). Geography of the digital hearth. *Information, Communication & Society*, *6*(4), 551–576. https://doi.org/10.1080/1369118032000163259

Frissen, V. A. J. (2000). ICTs in the rush hour of life. *The Information Society*, *16*(1), 65–75. https://doi.org/10.1080/019722400128338

Ghobakhloo, M., Iranmanesh, M., Vilkas, M., Grybauskas, A., & Amran, A. (2022). Drivers and barriers of Industry 4.0 technology adoption among manufacturing SMEs: A systematic review and transformation roadmap. *Journal of Manufacturing Technology Management*, *33*(6), 1029–1058. https://doi.org/10.1108/JMTM-12-2021-0505

Gibbs, J. L., Rozaidi, N. A., & Eisenberg, J. (2013). Overcoming the "ideology of openness": Probing the affordances of social media for organizational knowledge sharing. *Journal of Computer-Mediated Communication*, *19*(1), 102–120. https://doi.org/10.1111/jcc4.12034

Green, N. (2003). Outwardly mobile: Young people and mobile technologies. In J. E. Katz (Ed.), *Machines that become us: The social context of personal communication technology* (pp. 201–217). Transaction Publishers. https://doi.org/10.4324/9780203786826

Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice* (2nd ed.). Routledge.

Harwood, S. A. (2011). The domestication of online technologies by smaller businesses and the "busy day". *Information and Organization*, *21*(2), 84–106. https://doi.org/10.1016/j.infoandorg.2011.03.002

Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, *15*(2), 123–139.

Hynes, D., & Rommes, E. (2006). "Fitting the internet into our lives": IT courses for disadvantaged users. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 125–144). Open University Press.

Jiménez-Zarco, A. I., González-González, I., Martínez-Ruíz, M. P., & Izquierdo-Yusta, A. (2015). New service innovation success: Analyzing the influence of performance indicator nature. *Computers in Human Behavior*, *51*, 1024–1031. https://doi.org/10.1016/j.chb.2014.09.046

Kudyba, S. (2020). COVID-19 and the acceleration of digital transformation and the future of work. *Information Systems Management*, *37*(4), 284–287. https://doi.org/10.1080/10580530.2020.1818903

Lapointe, L., & Rivard, S. (2005). A multilevel model of resistance to information technology implementation. *MIS Quarterly*, *29*(3), 461–491. https://doi.org/10.2307/25148692

Leesakul, N., Oostveen, A. M., Eimontaite, I., Wilson, M. L., & Hyde, R. (2022). Workplace 4.0: Exploring the implications of technology adoption in digital manufacturing on a sustainable workforce. *Sustainability*, *14*(6), Article 3311. http://doi.org/10.3390/su14063311

Lemor, A. M. R. (2006). Making a "home": The domestication of information and communication technologies in single parents' households. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 165–181). Open University Press.

Leonardi, P. M., Huysman, M., & Steinfield, C. (2013). Enterprise social media: Definition, history, and prospects for the study of social technologies in organizations. *Journal of Computer-Mediated Communication*, *19*(1), 1–19. https://doi.org/10.1111/jcc4.12029

Lim, S. S. (2006). From cultural to information revolution: ICT domestication by middle-class families in urban China. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 185–204). Open University Press.

Lindlof, T. T. R., & Taylor, B. C. (2011). *Qualitative communication research methods* (3rd ed.). Sage.

Lindman, M. T. (2004). Formation of customer bases in SMEs. *The Marketing Review*, *4*(2), 139–156. http://doi.org/10.1362/1469347041569867

Livingstone, S. (1992). The meaning of domestic technologies: A personal construct analysis of familial gender relations. In R. Silverstone & E. Hirsch (Eds.), *Consuming technologies: Media and information in domestic spaces* (pp. 63–73). Routledge.

Livingstone, S. (2007). On the material and the symbolic: Silverstone's double articulation of research traditions in new media studies. *New Media & Society*, *9*(1), 16–24. https://doi.org/10.1177/1461444807075200

Marsh, E., Vallejos, E. P., & Spence, A. (2022). The digital workplace and its dark side: An integrative review. *Computers in Human Behavior*, *128*, Article 107118. https://doi.org/10.1016/j.chb.2021.107118

Masood, T., & Sonntag, P. (2020). Industry 4.0: Adoption challenges and benefits for SMEs. *Computers in Industry*, *121*, Article 103261. https://doi.org/10.1016/j.compind.2020.103261

Maton, K. I. (1993). A bridge between cultures: Linked ethnographic-empirical methodology for culture anchored research. *American Journal of Community Psychology*, *21*(6), 747–773. https://doi.org/10.1007/BF00942246

McDonald, T. (2015). Affecting relations: Domesticating the internet in a south-western Chinese town. *Information, Communication & Society*, *18*(1), 17–31. https://doi.org/10.1080/1369118X.2014.924981

Morley, D., & Silverstone, R. (1990). Domestic communication—technologies and meanings. *Media, Culture & Society*, *12*(1), 31–55. https://doi.org/10.1177/016344390012001003

Mukherji, S., & Arora, N. (2017). Digital communication: Easing operational outcomes in the workplace. *Procedia Computer Science*, *122*, 1084–1091. https://doi.org/10.1016/j.procs.2017.11.477

OECD. (2019). *OECD SME and entrepreneurship outlook 2019*. https://doi.org/10.1787/34907e9c-en

OECD. (2021). *The digital transformation of SMEs*. OECD studies on SMEs and Entrepreneurship. https://doi.org/10.1787/bdb9256a-en

Olsen, K. A., & Sætre, P. (2007). IT for niche companies: Is an ERP system the solution? *Information Systems Journal*, *17*(1), 37–58. http://doi.org/10.1111/j.1365-2575.2006.00229.x

Omidi, A., & Dal Zotto, C. (2023). How online collaboration software shapes control at work? Evidence from news organizations. *International Journal of Sociology and Social Policy*, *43*(11/12), 948–963. https://doi.org/10.1108/IJSSP-10-2022-0262

Piercy, N. (2010). Improving the marketing-operations relationship: Case evidence from an internet small-medium-enterprise. *The Marketing Review*, *10*(4), 333–351. http://doi.org/10.1362/146934710X541311

Pierson, J. (2006). Domestication at work in small businesses. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 205–226). Open University Press.

Poba-Nzaou, P., & Raymond, L. (2013). Custom development as an alternative for ERP adoption by SMEs: An interpretive case study. *Information Systems Management*, *30*(4), 319–335. https://doi.org/10.1080/10580530.2013.832963

Prasad, P., & Prasad, A. (2000). Stretching the iron cage: The constitution and implications of routine workplace resistance. *Organization Science*, *11*(4), 387–403. https://doi.org/10.1287/orsc.11.4.387.14597

Quandt, T., & von Pape, T. (2010). Living in the mediatope: A multimethod study on the evolution of media technologies in the domestic environment. *The Information Society*, *26*(5), 330–345. https://doi.org/10.1080/01972243.2010.511557

Ramdani, B., Kawalek, P., & Lorenzo, O. (2009). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management*, *22*(1/2), 10–24. http://doi.org/10.1108/17410390910922796

Risi, E., & Pronzato, R. (2021). Smart working is not so smart: Always-on lives and the dark side of platformisation. *Work Organisation, Labour and Globalisation*, *15*(1), 107–125. http://doi.org/10.13169/workorgalaboglob.15.1.0107

Rotar, L. J., Pamić, R. K., & Bojnec, Š. (2019). Contributions of small and medium enterprises to employment in the European Union countries. *Economic Research-Ekonomska Istraživanja*, *32*(1), 3302–3314. https://doi.org/10.1080/1331677X.2019.1658532

Shapiro, A. (2018). Between autonomy and control: Strategies of arbitrage in the "on-demand" economy. *New Media & Society*, *20*(8), 2954–2971. https://doi.org/10.1177/1461444817738236

Silverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Mansell & R. Silverstone (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 213–228). Oxford University Press.

Silverstone, R., Hirsch, E., & Morley, D. (1992). Information and communication technologies and the moral economy of the household. In R. Silverstone & E. Hirsch (Eds.), *Consuming technologies: Media and information in domestic spaces* (pp. 9–17). Routledge.

Sørensen, K. H. (2006). Domestication: The enactment of technology. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 40–61). Open University Press.

Sørensen, K. H., Aune, M., & Hatling, M. (2000). Against linearity—On the cultural appropriation of science and technology. In M. Dierkes & C. von Grote (Eds.), *Between understanding and trust: The public, science and technology* (pp. 237–257). Harwood Academic Publishers.

Soto-Acosta, P. (2020). COVID-19 pandemic: Shifting digital transformation to a high-speed gear. *Information Systems Management*, *37*(4), 260–266. https://doi.org/10.1080/10580530.2020.1814461

Steinfield, C., DiMicco, J. M., Ellison, N. B., & Lampe, C. (2009). *Bowling online: social networking and social capital within the organization* [Conference presentation]. Fourth international conference on communities and technologies, University Park, PA, USA. https://dl.acm.org/doi/10.1145/1556460.1556496

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Sage.

Tick, A., Saáry, R., & Kárpáti-Daróczi, J. (2022). Conscious or indifferent—concerns on digitalisation and sustainability among SMEs in Industry 4.0. *Serbian Journal of Management*, *17*(1), 145–160. http://doi.org/10.5937/sjm17-36412

Treasure-Jones, T., Sarigianni, C., Maier, R., Santos, P., & Dewey, R. (2019). Scaffolded contributions, active meetings and scaled engagement: How technology shapes informal learning practices in healthcare SME networks. *Computers in Human Behavior*, *95*, 1–13. https://doi.org/10.1016/j.chb.2018.12.039

Treem, J. W., & Leonardi, P. M. (2012). Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association*, *36*(1), 143–189. https://doi.org/10.1080/23808985.2013.11679130

Verhoef, P. C., & Bijmolt, T. H. (2019). Marketing perspectives on digital business models: A framework and overview of the special issue. *International Journal of Research in Marketing*, *36*(3), 341–349. https://doi.org/10.1016/j.ijresmar.2019.08.001

Ward, K. (2006). The bald guy just ate an orange: Domestication, work and home. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 145–164). Open University Press.

Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Press.

Zeiller, M., & Schauer, B. (2011). *Adoption, motivation and success factors of social media for team collaboration in SMEs* [Conference presentation]. The 11th international conference on knowledge management and knowledge technologies, Graz, Austria. https://dl.acm.org/doi/10.1145/2024288.2024294

Zeynalli, L., & Zeynalli, A. (2022). *The effects of the pandemic on the digital workplace*. Routledge.

BRIEF REPORTS

Training Workers for the Future Through Tripartite Partnerships

Harvard Business Review Analytic Services

Abstract

As companies plan for the future of work, one key challenge is ensuring they have workers with relevant skills in order to thrive in the years ahead. A major driver of this challenge is that new digital technologies are quickly rendering some workers' skills obsolete and shortening the half-life of others.

Artificial intelligence, automation, and other advances are also forcing executives to reconsider which roles humans are best suited to and which skills they will need to support companies' digital ambitions. Answering these questions effectively will ensure companies have the talent to stay competitive and seize new opportunities for growth and profitability.

Introduction

Artificial intelligence, automation, and other advances are also forcing executives to reconsider which roles humans are best suited to and which skills they will need to support companies' digital ambitions. Answering these questions effectively will ensure companies have the talent to stay competitive and seize new opportunities for growth and profitability.

"In Singapore, there is a need for enterprises to continuously transform themselves, be it adoptions of digitalization, automation, or even globalization," says Soon-Joo Gog, chief skills officer at SkillsFuture Singapore, the national skills authority and agency for promoting lifelong learning. "But that business decision has to be supported by a skilled workforce, and the question is to what extent the workforce is ready to support the business moving forward."

Among the ways companies are tackling these challenges is through tripartite partnerships for workforce reskilling and upskilling. Historically, companies and governments have shared the costs and risks of large-scale initiatives, such as infrastructure projects, through public-private partnerships. Tripartite partnerships—three-party agreements that involve companies, labor unions, and government—are being used to prepare workers for new roles commensurate with the business growth of their employers. These partnerships help their members coordinate training and needed skills, share information and data on the program's operations and success, and implement best practices.

Singapore's use of tripartite partnerships provides a compelling example. The country takes a collaborative approach adopted by unions, employers, and the government, with a focus on using company training committees (CTCs), which bring company management together with union and government representatives to establish coherent transformation and training strategies for businesses. CTCs are championed by unions, related organizations, and worker associations allied in a coalition known as The Labor Movement. The Labor Movement works closely with employers and the government to shape the national continuing education and training ecosystem, drive the efforts to train workers, and support business growth through consultations and collaborations between tripartite partners. But while Singapore is unique in some ways, it is not the only country where such partnerships are being used. And even where there may be political resistance to them—such as in the United States, which is less friendly to organized labor than other countries are—socioeconomic factors may ultimately favor them.

Even so, using tripartite partnerships can present myriad challenges. Chief among them is assuaging workers' fears that they could lose their jobs to new technologies. Also important is agreeing on goals for the partnership and revising the goals as priorities and demographics evolve over time. In addition, tripartite partnerships must build trust and transparency among partners and have leadership that is open to change and new ideas. And they need to measure success—as well as areas for improvement—in both the short term and the long term, adjusting their methods accordingly. When done right, initiatives rolled out with the support of tripartite partnerships can help ensure that employees, organizations, and national workforces have a sustainable pipeline of future-ready skills, leading to better prospects for everyone.

"What we see to be success," says Valerie Lee, senior HR director for Singapore and the Philippines at ams OSRAM, a Premstaetten, Austria–based intelligent sensor maker, "would be programs that result in economic growth in metrics like [gross domestic product], maintaining a low unemployment level, and ensuring wages across all strata of society keep pace with the rising cost of living, together with the socioeconomic progress of all workers and ensuring industrial harmony and cooperation."

This report will explore how tripartite partnerships among employers, labor unions, and government are helping companies' and countries' workforces prepare for the future of work. It will touch on the training initiatives that are made possible by collaborations, such as those involving Singapore's CTCs. The report will also examine the benefits and risks of training programs, the best practices for ensuring they run smoothly, the ways their success is measured, and the emergence of tripartite partnerships to push them forward.

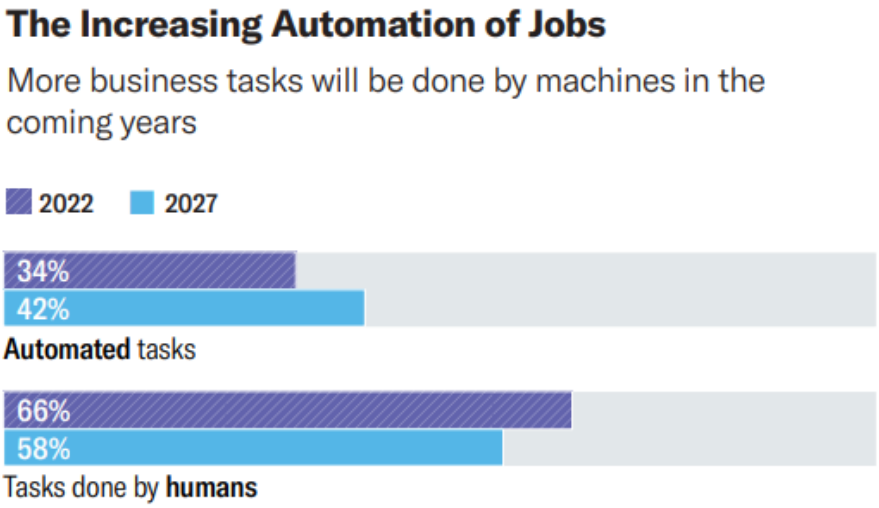
Company Training Committees in Singapore

The tripartite partnership in use in Singapore, where companies, unions, and the government collaborate to strengthen the workforces of organizations as well as the nation, is seeing results.

A key part of the collaboration is the involvement of CTCs, which were introduced by The Labor Movement to help workers upskill and reskill in tandem with business transformation. Besides monitoring the organization's talent and skill needs on an ongoing basis, CTCs can identify jobs that are likely to be disrupted by digital transformation, coordinate training plans to help workers learn new skills, and encourage workers to embrace change and think about long-term career growth. This kind of proactive oversight is important since more and more jobs are being affected by digital advances; 34% of tasks were able to be automated by 2022, and the percentage is only going to rise in the years ahead.

Figure 1

The Increasing Automation of Jobs



Source: World Economic Forum, May 2023

Tripartite representatives say that CTCs help companies achieve greater productivity, innovation, and profitability, while workers both learn new skills and achieve higher wages or bonuses through gainsharing by companies.

The collaboration process begins with workshops conducted by The Labor Movement with the participation of company management and union representatives. The goal is to chart the company's plans for the future and the changes that will be necessary for the organization to continue growing and competing. Changes might include, for example, digitally transforming areas of the business and reskilling or upskilling workers for new types of roles. At the end of the workshops, the company is presented with a customized operations and technology roadmap that charts its strategic direction as well as the resources it will need—including talent, technology, and products—to fulfill its plans.

"After we finish this training to understand our transformation roadmap, we are able to identify the areas where we need some improvement," explains Li Cheng Ew, general manager of supply chain at Singapore-based company Singapore Epson Industrial Pte Ltd. "It covers personnel, the operations side, the system members, and human resources."

Retraining a workforce—a task that will remain essential as technologies advance and jobs evolve—can come with considerable costs. According to a January 2023 study by Boston-based consultancy firm Boston Consulting Group, top companies spend up to 1.5% of their annual budgets on learning and skill building, which is comparable to what many organizations spend on transformation programs or IT (Goel & Kovács-Ondrejkovic, 2023). Because of the strong tripartite partnership in Singapore, the government is willing to fund companies and workforce

transformation through CTCs. Once a company has established its CTC and made plans for reskilling workers in accordance with its roadmap, it can receive a grant from the government that covers up to 70% of the initiative's cost. These grants, administered by The Labor Movement, support companies in implementing transformation plans that lead to better work and business outcomes.

"In recent years, during Covid-19, the Singapore government has realized that transformation is very important in order to stay relevant," says Ew. "So, the government and the respective authorities have focused more efforts and started to get very much involved with us by coming in to assist us.

Besides enabling The Labor Movement to be progressive in supporting workers to upgrade their skills to stay relevant, CTCs offer various supports to companies. One example is CTCs connecting companies directly to education and training providers, facilitating conversations about skill needs and modes of learning. Another is the partnership offering individuals career coaching services, which help people assess their professional options and draw on resources and support if they want to make a career change. A third example is a S$500 credit that all Singaporeans receive upon turning 25 years old, which can be used to pay for eligible government-approved training courses, encouraging individuals to take ownership of their skill development and learning journeys. Together, these initiatives form a robust approach to reskilling and upskilling the country's workers. "In Singapore, our arrangement is always making sure that we take care of the workforce, together with the unions," says SkillsFuture Singapore's Gog. "We also ensure we have skilled workforces to support companies' business requirements."

As companies plan for their future workforce needs, and as governments and unions look for ways to partner with them to benefit all workers, tripartite partnerships through CTCs are one approach to training that they may want to consider.

Tripartism for Training Worldwide

Singapore is not the only country to use tripartite partnerships for workforce training. Other countries have leveraged them as well, though not always in the same ways; additionally, in some countries, the training efforts are led by industry partners, as compared with Singapore's CTC approach.

Germany, for example, is known for its vocational education and training (VET) system, in which the government, employers, and unions collaborate. The system includes several kinds of training programs that young people can choose from as an alternative to higher education, with courses that can be completed in an educational institution, a company, or a combination of the two, depending on the qualifications the person is seeking. The core of the VET system, according to a 2020 report by the European Centre for the Development of Vocational Training, is the apprenticeship program, in which people learn theoretical knowledge in school and on-the-job skills in a company (European Centre for the Development of Vocational Training, 2020). Organizations and public institutions sign contracts with apprentices to participate and then cover the cost of training—companies by paying for it themselves and educational centers through government funding. Companies also pay apprentices for their work. When people complete the program, they leave with qualifications that give them access to the labor market as skilled workers. More-advanced training programs are available as well to those who want them.

Sweden, meanwhile, launched its "fast-track" program in 2015 to help newly arrived immigrants find jobs faster based on the skills they have. Tripartite talks between the Swedish Public Employment Service and the social partners (employers and trade unions) were used to establish more-efficient pathways into specific jobs, including teacher, doctor, nurse, and dentist. The program included elements such as Swedish language classes, vocational courses in which participants learn professional vocabulary and how their future jobs operate in Sweden, guidance on getting certified to perform those new jobs, and internships or traineeships. In May 2023, the Swedish government announced that the fast-track program would be discontinued and replaced with a new certification scheme for work permit applications, due to the current application process becoming too slow and putting companies at risk of losing talent. The new program is

expected to begin by the end of 2023.

Switzerland, too, has a tripartite VET system—one that is largely led by the private sector. Trade associations, unions, training providers, and companies that host apprenticeships jointly create and implement VET policy—participation is mandated by law—and the Swiss government regulates the process. Similar to the system in Germany, young people work in companies to pick up trade skills and learn complementary knowledge in vocational schools, and they're paid by the companies that host the apprenticeships. At the end of the program, which typically lasts three to four years, participants are awarded federal diplomas once they pass the federal examination. The system's success is due to factors including the tripartite structure, in which members collaborate to maintain the system's standards, and the federal examination, which ensures that skills are standardized and transferable. According to a 2015 report by the Legislative Council Secretariat in Hong Kong, Switzerland's VET system is widely regarded as one of the best in the world, and the country has helped other countries—including South Korea, India, Spain, and China—develop their own VET systems (Chu, 2015).

While other countries also have tripartite systems for worker training, some of them similarly focused on VET programs, these examples show just a few of the forms that such systems can take.

The Benefits of Tripartism

A tripartite partnership like Singapore's CTC-based approach can have a number of benefits, from establishing a shared language of skills to drawing on unions' expertise in bringing together organizations and talent to connecting companies to the suppliers and partners they need.

Organizations and governments around the world are thinking about how to ensure workforces have skills for the future, but one obstacle is the lack of a shared skills taxonomy. Different companies and countries may use the same words to refer to different skills or different words for the same skill, which can present issues when trying to understand exactly where skill gaps exist. In a 2021 report, the World Economic Forum called for the development of a global skills taxonomy to support reskilling efforts across countries, explaining how agreed-upon definitions are essential for assessing workers' proficiency levels and exploring new career pathways (World Economic Forum, 2021). The report noted, for example, that cashiers have more than a 92% skill similarity to ticket agents, travel clerks, restaurant hosts, retail salespeople, and baristas—the kind of reskilling focused insight that a shared skills taxonomy can unearth.

Singapore's CTC initiative has prioritized establishing a common language of skills, including sectoral skills frameworks. These frameworks help the government, trade associations and chambers, unions, and companies focus on continual upskilling of the workforce. Shared definitions also help workers pursue new training on their own, since they can be confident about investing their time and money in the courses they truly need. "From the government perspective, we try to ensure that we have a common language when we talk about skills," says Gog. "So, when we articulate the skill needs of the economy, we are on the same page."

The participation of unions is another central benefit of tripartite collaborations, especially in Singapore, where unions and The Labor Movement are key partners for a range of activities. Applying for government training grants can be complicated for companies that are new to the process, says Ew, and unions can offer assistance. "We will seek some advice from them on how to do the presentation of our project, and then they help us in that area because they work closely with all the relevant authorities in Singapore," she explains. Ew adds that unions can help companies find talent when filling open positions is difficult. "They play the role of a connector between the government authorities and companies," she says.

An additional boon of working with unions is that they bring a practical perspective to high-level discussions about talent, skills, and national workforces. Conversations about skill gaps, course offerings, and how fast training can be scaled up are always ongoing at the sectoral level in Singapore, Gog explains, and it's important to shift those conversations to company-level dialogues as well. "The union can really bring it down to where the tires hit the road and say, 'Hey, this is serious, we are going to do this for the company.' I think that's very, very important,"

she says. At the same time, unions also take part in conversations at the sectoral and national levels about the future of the economy, the direction of transformations, and how the tripartite partnership can help people more—making them core partners in thinking broadly about Singapore's workers. "It's a very holistic approach to supporting the workforce," she says.

A third benefit of Singapore's tripartite arrangement is the ability to connect companies to suppliers and partners. Since The Labor Movement has an overview of the organizations participating in the partnership, companies can ask for assistance when they're searching for valuable new partners. "If we have any issues—for example, if we don't know what we need or we are looking for certain suppliers—we can always contact them and ask whether they have some contacts, and then they'll connect us together," says Ew. CTCs can also encourage companies to exchange information and advice about training with each other and even share training themselves. "Sometimes other companies have some relevant courses that they share with us to see whether we are interested [in attending]," Ew explains.

These kinds of benefits show the many ways that tripartite partnerships can benefit participants and in particular the necessity of having unions and government—and, in Singapore's case, The Labor Movement—involved.

Overcoming Challenges and Risks

Tripartite partnerships can help overcome several kinds of challenges, including reassuring workers about their fears of losing their jobs, setting and maintaining agreement on the goals for the partnership, and adapting to changing demographics.

Anxiety about job security is common in her company, says Ew, especially for older workers who have a wealth of experience but whose jobs are becoming much more technology driven. As Singapore Epson Industrial shores up its strengths in automation and digital tools, these workers can sometimes be resistant to change due to their worries of being replaced by technology. The tripartite partners can help communicate to workers what's changing and why and, crucially, how workers will benefit from the new technologies. Ew points out that these kinds of messages can be more persuasive when they come from an outside authority rather than from company executives. "Sometimes for us as a company to explain to the employees—I think the first impression is that they feel that we are trying to replace them," she says. "But on the other hand, when the tripartite partnership comes into the picture, they can explain to the employees as a neutral party that, actually, this is not a job replacement, but this is actually job enrichment."

Also important for a tripartite partnership is agreeing on the goals of the initiative, especially as priorities for the partners change over time. While governments, companies, and unions may broadly want many of the same things—a competitive workforce and good jobs and salaries for workers—they may differ on the best ways to achieve them. The partners may disagree, for example, on which kinds of training workers need most urgently, as well as which training will best fill skill gaps.

Maintaining these shared goals is also difficult during societal shifts or when the business environment undergoes changes, notes ams OSRAM's Lee. While reaching consensus about the partnership's goals may never be simple, doing it while dealing with extra economic pressure can be a formidable task. "Economic downturns or global crises can strain the partnership, as the government, employers, and workers may all have differing priorities and interests during such periods," she says. "Balancing job security, wage growth, and business sustainability becomes a challenge."

Tripartite partnerships also must stay abreast of demographic shifts that are relevant to their goals and react accordingly. In Singapore, for example, the population is aging—by 2030 nearly one in four citizens will be 65 or older, according to "Population in Brief 2022," a report jointly issued by several Singapore government entities (National Population and Talent Division et al., 2022)—and there is a need for a more diverse and multicultural workforce, says Lee. "Adapting the partnership to address these changing demographics and skill requirements is a continuous challenge," she says.

At the same time, Gog asserts, it's imperative that the tripartite partnership takes the lead on responding to a multigenerational workforce, since doing so will help ensure that inclusive training solutions can support the greatest number of people, ensuring access to training for all. "We need a robust and responsive skills ecosystem to respond to the skill needs of the economy and sectors of the workforce," she says. Developing more skills development partners, such as trade associations, professional bodies, and union groups that can get involved with skill training, can build up a reskilling ecosystem that will be sustainable into a country's future. "The key challenge is really to keep building this capability over time," she explains.

Proactive moves like these can prepare a tripartite partnership to respond to whatever challenges come up for its members.

Making Tripartite Partnerships Work

To set up a tripartite partnership for success—which includes win-win outcomes such as higher productivity for companies and higher wages and new skills for workers—a few steps can help: building trust, transparency, and flexibility; staying coordinated on goals and approaches; and having open, supportive leadership.

Trust in the partnership means that all partners are involved in conversations about skills, jobs, and the needs of the future. "No one is left behind. Everybody knows what we're talking about, and cocreation is key," explains Gog. Transparency is a parallel factor; tripartite partners should be open about their goals and concerns so that they can solve problems together. And flexibility involves giving workers many options for training, which lets them choose the ones that best fit their lives and schedules. Flexibility can mean, for example, offering both in-person and online training, during-work and after-hours courses, and options at professional institutions, universities, and employers.

The payoff of building trust, transparency, and flexibility is a learning ecosystem that lifts everyone collectively. Demonstrating these three elements, in Lee's view, shows a commitment to mutually beneficial growth. "In Singapore's model of tripartism, as long as there is visible and obvious success for any program for the population at large, the government and companies will find a way to make it happen," she says.

Also important is for the tripartite partners to stay clear on the direction forward over time by engaging in continual conversations. Discussing what workers need, or need more of, will remain a core part of the collaboration as workforce needs continue evolving. Tripartite partners must be committed to sharing insights on topics such as whether new kinds of training are needed, how to scale current training, how to help workers apply what they're learning, and whether the financial support offered to companies and workers is sufficient. "Continuous dialogue is very key," explains Gog. "Conversations like this have to be ongoing all the time."

Ew says that building consensus around key factors like these often comes naturally in Singapore, whose culture values social cohesiveness and collectivism. "This is something in our culture that doesn't need to be spelled out," she says. "When we want the economy to grow, we need the company to grow. And when we need the company to grow, we need the employee to grow." Discussions of those factors also reinforce the elements of trust, transparency, and flexibility that help tripartite partnerships run smoothly.

Social cohesiveness and collectivism are clearly less prevalent in countries such as the U.S., but even there, worker interests are starting to draw more attention as the environmental, social, and governance movement gains traction. Indeed, the influential group of leading corporate executives known as the Business Roundtable now urges management to place as much emphasis on worker welfare as on shareholder value (Business Roundtable, 2019). Among the commitments made in its landmark 2019 Statement on the Purpose of a Corporation was "investing in our employees. This starts with compensating them fairly and providing important benefits. It also includes supporting them through training and education that help develop new skills for a rapidly changing world."[7] However, whether the public-private partnerships in the U.S. will eventually evolve into tripartite arrangements, with the national-level perspective that other countries take, remains to be seen. "We look at this at a national level, because we truly believe

an inclusive and competitive economy has to be the way to go forward," says Gog. "Everybody has to have a part in it."

When it comes to leadership for tripartite initiatives, key characteristics are willingness to collaborate, openness to new ideas, and ability to adapt to change. Embracing collaboration is an obvious requirement for the partnership, but it's also useful for executives to be proactive about their role, says Gog. She points out that tripartite partners in Singapore from both industry and unions have taken the initiative to convene discussions and drive the dialogue forward. "All of us, we volunteer our time and the willingness to come together," she says.

Meanwhile, being open to new ideas means that leaders can strategically consider which opportunities will best support their workforces. Finally, tripartite partnerships benefit from leadership that can adapt to new circumstances, including by keeping future needs, trends, and circumstances in mind. "They have to have a certain mettle in them to ensure that they will be able to make decisions that are not just for immediate gains but also ensure that Singapore as a whole will gain in the long run," says Lee.

If tripartite partnerships build trust, transparency, and flexibility; stay coordinated in achieving their goals; and have leadership that can support forward-looking collaboration, they'll be on a firm foundation for success.

Measuring Success

To gauge the effectiveness of their initiatives, including CTCs, tripartite partnerships can use a range of measures, such as participation rates in training programs, whether the programs are helping people achieve their career goals, and how happy and effective workers are.

Some of the most straightforward metrics are Singapore's annual training participation rates, which help tripartite partners understand whether training programs are reaching the people who need them. But just as important is knowing whether the training is helping people reach their career goals, says Gog. She cites indicators such as whether people have mobility in their careers, whether they're advancing in their companies, and whether their wages increase over time. "It's not just about the motions of going for training—it's more about the outcomes of training, whether people have career growth and salaries that do not stagnate," she says.

Other metrics help the partnership get a fuller view of how it helps workers. The partners monitor, for example, the bottom 25% of the country's workforce, keeping a close eye on how those workers are progressing in comparison with their peers. Singapore's government also commissions researchers both within the country and globally to review the partnership's projects and offer feedback. Gog says these structured reviews take two to three years to complete and offer an objective view of how well the partnership's goals are being met. At the same time, the tripartite partners make smaller, more regular tweaks to their initiatives according to what they hear from workers. "We might adjust based on what is working well, not working well, what is most effective, what employers desire, what individuals will be most motivated to do," she explains. "You cannot wait too long to make those adjustments."

For more on-the-ground success metrics, Ew says how accurately workers do their jobs and how happy they are can both be useful indicators. Especially when workers are bringing new skills to their roles from training, performance accuracy can show supervisors where workers may need additional help to strengthen their skill sets. On the other hand, workers' happiness at, for example, more-routine parts of their jobs being automated can be a sign that the tripartite partnership's goals and message—including that technology won't replace people—are being heard. "In the past, our workers may be doing a huge volume of manual data management, but all this could be replaced by digitalization," Ew explains. "Now they are happy that we have completed our project under the grants for the digitalization platform."

There are a number of ways that tripartite partnerships can measure their success and find areas for improvement. What may be most important, though, is carefully tying those measures to the outcomes the partnership is seeking.

Conclusion

Tripartite partnerships for workforce training can offer a number of benefits to workers, companies, and countries' economies. Working closely with unions and government, companies can draw on their collective expertise in the skills workers need, the career goals they're targeting, and how best to help them continue learning and growing. Using financial support from governments, companies can reimagine their workforces for future business needs, retraining employees in areas such as digital skills at scale and at lower cost. By sharing insights and feedback about how training initiatives are helping workers and where improvements are needed, tripartite partners can cocreate a skilling ecosystem that supports all workers, especially as changes in demographics and economic circumstances mean new training approaches are required.

As Singapore's example shows, such an ecosystem can create the foundation for future training initiatives as well, such as by bringing in additional professional bodies and learning institutions to increase the partnership's capabilities. Through its CTC initiatives, Singapore's Labor Movement serves as a nexus of industry, company, and workforce transformation, and it must continue to innovate to be a champion of workers and help them stay competitive and relevant.

The task of preparing workers for the future is an ongoing one, so the work of a tripartite partnership may never be complete. Yet the results of a successful partnership are profound and wide-ranging; companies and nations alike have the workers they need to thrive for years to come and, just as important, workers have the skills to advance in their careers, increase their salaries, and build the quality of life they desire. "The goal is not about just reskilling workers; reskilling is a means to an end," says Gog. "The end has to be a competitive, inclusive economy where everybody benefits— not just the enterprise. The workforce must benefit too."

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BIOGRAPHY

Harvard Business Review

Harvard Business Review Analytic Services is an independent commercial research unit within Harvard Business Review Group, conducting research and comparative analysis on important management challenges and emerging business opportunities. Seeking to provide business intelligence and peer-group insight, each report is published based on the findings of original quantitative and/or qualitative research and analysis. Quantitative surveys are conducted with the HBR Advisory Council, HBR's global research panel, and qualitative research is conducted with senior business executives and subject matter experts from within and beyond the Harvard Business Review author community.

REFERENCES

Business Roundtable. (2019). *Business Roundtable redefines the purpose of a corporation to promote 'An economy that serves all Americans'.* https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

Chu, K. (2015). *Information note: Vocational education and training in Switzerland.* Research Office of the Legislative Council Secretariat of Hong Kong. https://www.legco.gov.hk/research-publications/english/1415in12-vocational-education-and-training-in-switzerland-20150526-e.pdf

European Centre for the Development of Vocational Training. (2020). *Vocational education and training in Germany.* http://data.europa.eu/doi/10.2801/329932

Goel, S. & Kovács-Ondrejkovic, O. (2023, January 26). *Your strategy is only as good as your skills*. Boston Consulting Group. https://www.bcg.com/publications/2023/your-strategy-is-only-as-good-as-your-skills

National Population and Talent Division, Singapore Department of Statistics, Ministry of Home Affairs, Immigration & Checkpoints Authority, and Ministry of Manpower. (2022). *Population in Brief*. https://www.strategygroup.gov.sg/files/media-centre/publications/Population-in-Brief-2022.pdf

World Economic Forum. (2021*). Building a common language for skills at work: A global taxonomy.* https://www3.weforum.org/docs/WEF_Skills_Taxonomy_2021.pdf

World Economic Forum. (2023). *Future of jobs report.* https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

The Impact of Internships on Graduates' Employability: Employers' Insights

Janine Yeong, Christabel Kam, Edwin Lye and Shannon Boo

Abstract

Internships serve as a valuable tool for students to develop their skills and knowledge, preparing them for a smooth transition into the workforce. The participation in internships amongst students in Singapore has increased as students recognise the need to distinguish themselves from their peers in the job market. Additionally, there is a common belief that employers prioritise fresh graduates with extensive internship backgrounds from reputable organisations. The Singapore National Employers Federation conducted a survey to challenge this belief and examine employers' perspectives on the internship experiences of fresh graduates. A total of 208 organisations, with a combined workforce size of nearly 250,000, responded to the survey conducted from December 14, 2023 to February 20, 2024. Results suggested that a majority of employers do not consider the number of internships completed and profile of internship organisation as priorities. This paper sheds light on what employers look out for when assessing the internship experiences of fresh graduates. It also discusses the implications for other stakeholders, including students and Institutes of Higher Learning.

Introduction

Internships provide significant benefits for students and employers alike (Maertz et al., 2014). For students, internships serve as a bridge between classroom learning and real-world application, offering them the opportunity to gain valuable skills and industry experience. Employers too stand to gain as organisations can leverage internships to build a strong, robust talent pipeline and reduce hiring costs.

In Singapore, internships have become increasingly prominent, with the Institutes of Higher Learning (IHLs) incorporating them into their curricula (Ang, 2022; Teng, 2021). Most students enrolled in IHLs are now required to undertake internships as part of their graduation requirements.[1] To deepen their industry exposure and boost their career prospects, students are encouraged, in part by the IHLs, to pursue additional internships beyond those made compulsory for students.

Especially in recent years, the trend of students undertaking multiple internships concurrent with their academic studies has garnered significant attention (Lim, 2023; Yeo, 2023). Some students have even opted to take a leave of absence and defer their studies to pursue additional internships (Yeo, 2023; Yuen, 2019). This trend is also seemingly perpetuated by the belief that employers prioritise the quantity of internships and profile of internship organisation when evaluating the internship experiences of fresh graduates (Tay, 2023).

Research shows that internships boost the employability prospects of fresh graduates (Gault et al., 2000; Kapareliotis et al., 2019). However, there is also evidence to suggest that not every internship contributes positively to their career prospects (O'Higgins & Pinedo, 2018).

Therefore, as literature on graduate employability is often from the perspective of employees, this paper seeks to provide evidence-based insights on the impact of internships on graduate employability from a less investigated perspective—the employer perspective—in the context of Singapore.

Research Methodology

Survey Design

To examine the perceptions and considerations of employers on the internship experiences of fresh graduates when recruiting for entry-level positions, a research team at the Singapore National Employers Federation (SNEF) adopted a mixed-method approach to the study. An online survey comprising both quantitative and qualitative questions was conducted from December 14, 2023 to February 20, 2024.

The survey was divided into three sections: (a) the organisation profile of respondent, (b) the organisation's current practices when shortlisting fresh graduates for entry-level positions, and (c) the value that the organisation placed on internship experiences when recruiting fresh graduates for entry-level positions. The survey consisted primarily of closed-ended questions, with one open-ended question. To lend further insights into employers' considerations on the internship experiences of fresh graduates across different qualification levels, the closed-ended questions were broken down into the following educational qualifications: (a) Nitec/Higher Nitec,[2] (b) Diploma,[3] and (c) Bachelor's Degree. For the open-ended question, respondents were asked to provide feedback on the challenges encountered when selecting fresh graduates based on their internship experiences.

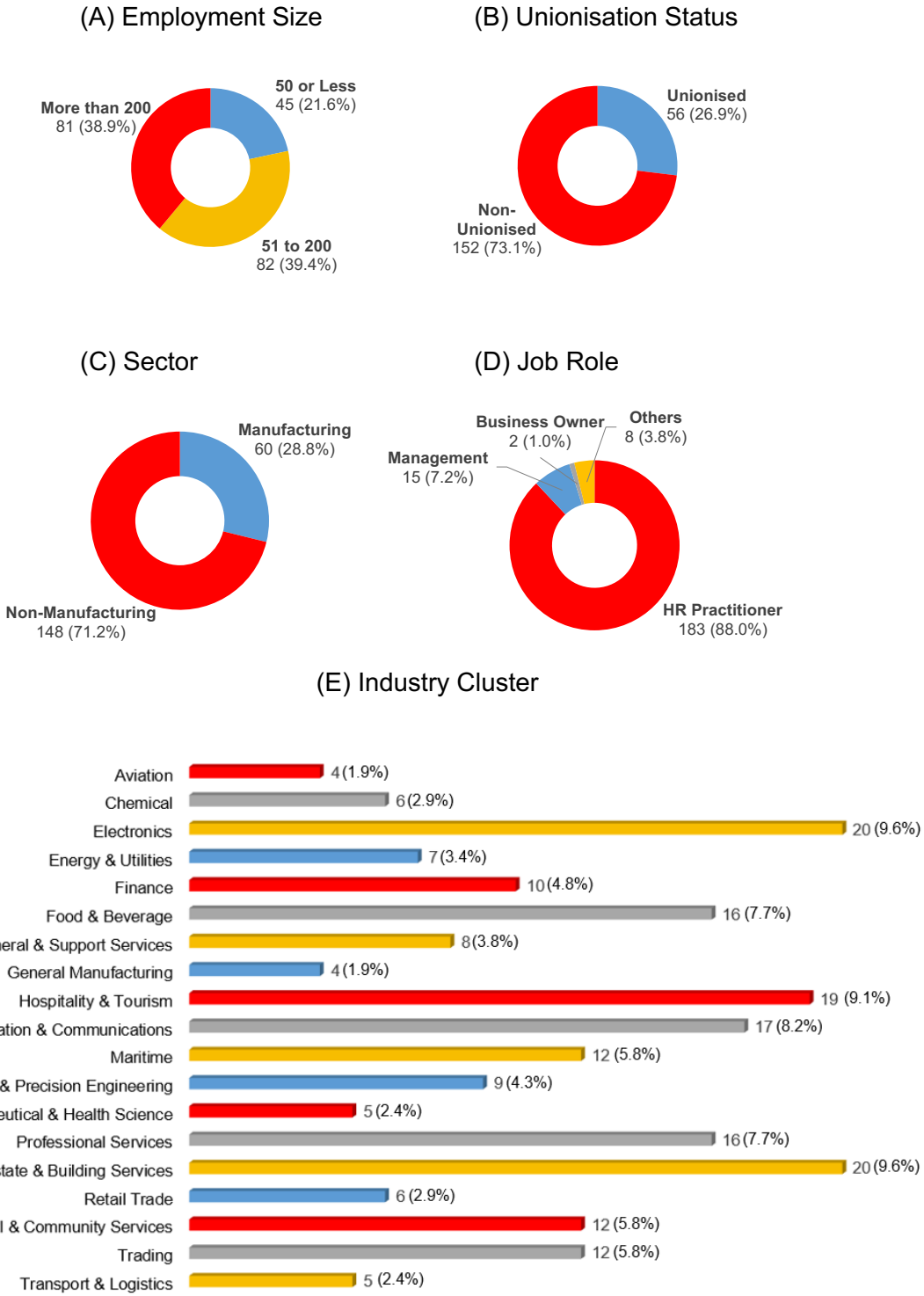
[1] The IHLs include the Institute of Technical Education (ITE), polytechnics, and autonomous universities. Internships are a graduation requirement at all IHLs, except for some majors at the National University of Singapore.
[2] Nitec/Higher Nitec certificates are awarded to ITE students pursuing technical and vocational studies.
[3] Diploma qualifications are awarded to polytechnic graduates.

Survey Respondents

A total of 208 organisations with a combined workforce size of almost 250,000 responded to the survey. The majority of respondents were Human Resource practitioners (88%), followed by Management representatives (7.2%). Among the organisations surveyed, 61% had an employment size of up to 200 and 26.9% were unionised. The organisations were distributed across 19 industries, with about three in 10 from the Manufacturing sector. A detailed breakdown of the respondent profile is presented in Figure 1.

Figure 1

Breakdown of Respondent Profile



Results

The results indicated that nearly seven in 10 organisations (68.6%) used internship experience as a determining factor in selecting fresh graduates for entry-level positions.

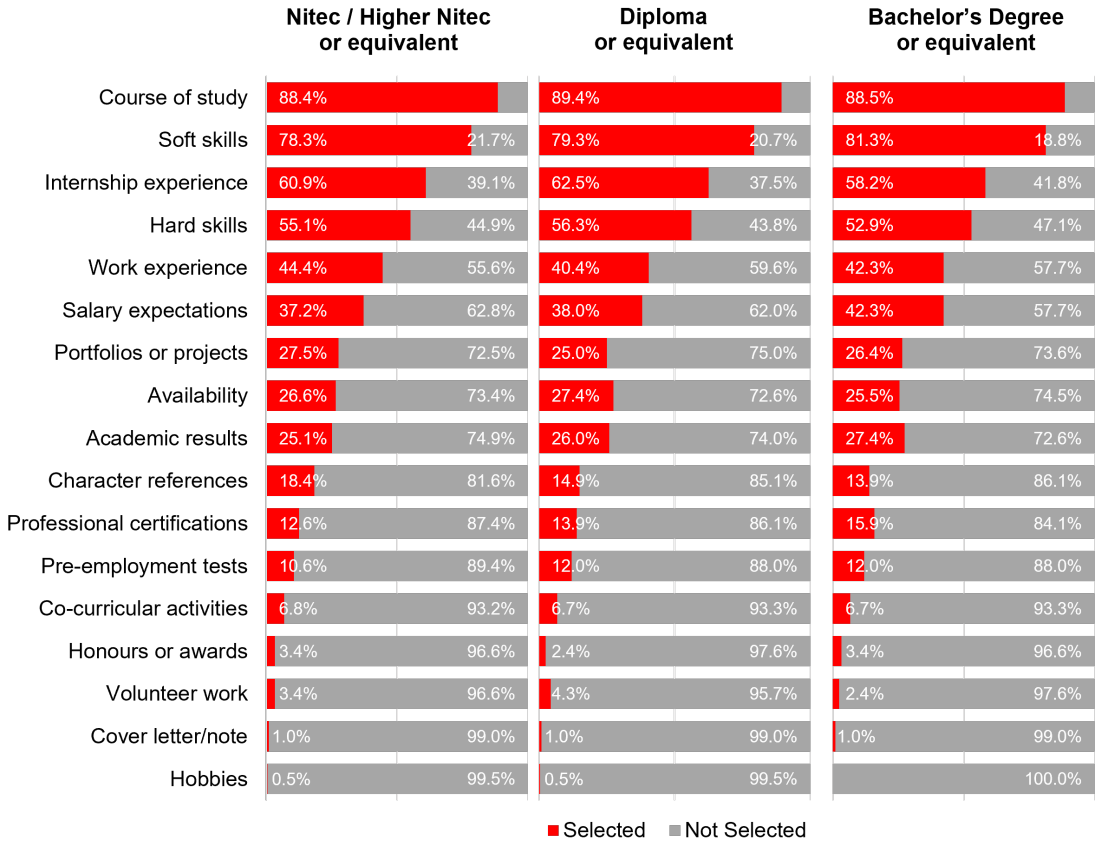
Between credit-bearing and non-credit-bearing internships,[4] two thirds of organisations (67.8%) expressed no preference on the type of internship experience they viewed more favourably. However, nearly three in 10 organisations (28.8%) preferred candidates with credit-bearing internship experience to non-credit-bearing internship experience. Within the industry clusters, organisations in Aviation, Real Estate & Building Services, and Trading were more likely to prefer credit-bearing internships.

The results also revealed a strong preference among organisations for candidates who had graduated from a relevant course of study and possessed relevant internship experience. However, in terms of relevant course of study vis-à-vis relevant internship experience, organisations were more partial to candidates who had graduated from a course directly relevant to the industry.

Graduate Recruitment

Figure 2

Criteria to Shortlist Fresh Graduates by Educational Qualification



Note. Respondents were allowed to select up to five options for each qualification level.

[4] Credit-bearing internships are internships organised and coordinated through the education institution. Such internships are related to the student's course of study and part of the academic course requirements, which may have a minimum or fixed duration and an assessment component. Academic credits are awarded to students after successful completion of the internship. On the other hand, non-credit-bearing internships are not part of the academic course requirements and are often independently secured by students, which may or may not be related to their course of study. Students do not earn academic credits for such internships.

When hiring for entry-level positions, the top selection criteria that organisations used to shortlist fresh graduates across all three educational qualifications were similar: (a) course of study, (b) soft skills, (c) internship experience, and (d) hard skills (see Figure 2). Within the industry clusters, organisations in Aviation, Metal & Precision Engineering, and Retail Trade were more likely to use internship experience as a criterion to shortlist fresh graduates.

Value of Internships on Graduate Recruitment

Table 1

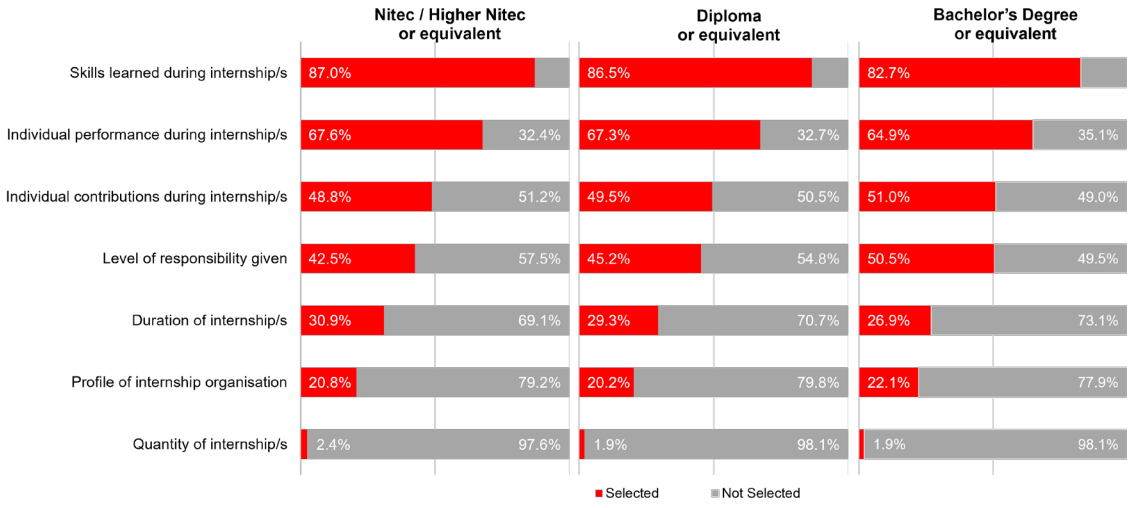
Ranking of Internship Experience

Overall rank	Type of internship experience	Mean rank [a]
1	**Internship experience with organisation or related organisations**	1.3
2	**Internship experience in similar roles within the same industry**	2.3
3	Internship experience in different roles within the same industry	3.3
4	Internship experience in similar roles across several industries	3.5
5	Internship experience in different roles across several industries	4.6

[a] A lower mean rank indicates that respondents ranked the option higher, signifying higher importance.

Figure 3

Assessment of Internship Experience by Educational Qualification



Note. Respondents were allowed to select up to three options for each qualification level.

Table 1 shows that organisations had a strong preference for candidates who had interned at their organisation or related organisations, followed by those who had internship experience in similar job roles within the same industry. Candidates with internship experience in different job roles across several industries were least preferred by organisations.

Skills learnt during internships remained the most important factor for organisations when assessing the internship experience of fresh graduates (see Figure 3). For organisations that selected internship duration as an important factor, the median total duration of internships desired by organisations was 24 weeks. Among the minority of organisations that selected quantity of internships, the median number of internships expected by these organisations was two, regardless of the educational qualifications.

When determining starting salaries, more than half of the organisations (57.2%) indicated that they had a standardised compensation package for entry-level positions. Close to one quarter of organisations (24.5%) were willing to offer higher starting salaries to fresh graduates with relevant skills.

For the open-ended question, the challenges were identified and organised into the following categories:

1. One in 12 organisations (8.7%) indicated that the internship experience of fresh graduate candidates was often not directly related to the role and industry, and finding a candidate with both relevant educational background and internship experience was challenging.
2. More than one in 10 organisations (11.1%) said that the relevance and quality of internships were also not easily understood. They cited difficulties in understanding the rigour of internship experiences as the candidates' skills, projects, and contributions were either insufficiently reflected or overstated on their résumés.
3. Nearly one in 10 organisations (9.1%) expressed concerns regarding the brief duration of internships, particularly those lasting less than 12 weeks. Such short internships might not provide students ample exposure to the role and industry, thereby presenting challenges for organisations in sufficiently assessing candidates' ability and potential to handle the responsibilities of a full-time position.

Discussion

This section discusses the survey results and delves into the value of internship experiences through the lens of employers. It also examines the implications for other stakeholders, including students and IHLs.

Quality, Not Quantity: Employers Say

SNEF's findings reveal that a majority of employers view internship experiences, alongside course of study and skills, as a key consideration when shortlisting fresh graduates for entry-level positions.

Indeed, with geopolitical and economic uncertainties dampening business sentiments, employers have adopted a conservative approach in their hiring process, preferring candidates with relevant work experience. This is also supported by Randstad's findings in the Job Market and Salary Guide Report in February 2024, which highlighted a shift to cautious hiring amidst global challenges as organisations in Singapore sought to recruit individuals with relevant skills and experience (Randstad, 2024).

Although fresh graduates generally lack the practical experience that seasoned candidates possess, internships often provide fresh graduates a foot in the door by gaining some real-world experience and an opportunity to hone necessary skills. Employers thus see such internship experiences as a valuable yardstick in assessing the work-readiness and potential of their fresh graduate candidates.

However, not all internships are created equal. Employers in SNEF's survey cited challenges in assessing the relevance of candidates' internship experiences, as their internship experiences may not align closely with the position. Indeed, assessing the internship experiences of fresh graduate candidates may not be clear-cut, given the multitude of factors to consider, such as the industry, organisation, and relevance of roles and responsibilities.

In addition, the aspirations and attitudes of youths on work today are changing. With the aim to broaden their skill sets and explore diverse interests, more students are pursuing internships in roles and industries not directly related to their field of study or prospective careers (Ng, 2024). This makes assessing fresh graduates' internship experiences even more challenging.

A research study on graduate recruitment in the United States revealed that employers regard completing an internship within their organisation or industry as the most significant factor when choosing between two equally qualified candidates (Gray, 2022). This is reflective of SNEF's results as it shows that employers place greater importance on internship experiences within the same industry, as opposed to internship experiences across several industries. It is also not surprising that employers are most inclined towards candidates with experience in their own organisation or related organisations.

As such, if students take on internships unrelated to their studies or desired job role, the skill sets acquired from such internships may not be immediately apparent to employers. Unless they are able to demonstrate transferable skills on their résumés, fresh graduates with seemingly unrelated internship experiences may be at a disadvantage as employers prefer candidates with relevant industry experience. That said, having a repertoire of skills may not necessarily be a drawback, as start-ups and smaller organisations often value those with learning agility and a varied skill set (Tandon, 2023).

There is also a common perception that employers attach great importance to the number of internships completed and reputation of the internship organisation (Tay, 2023). SNEF's survey results suggest otherwise. In fact, as Figure 3 shows, an overwhelming number of employers do not regard these two considerations as important, and the results remain consistent even when looking at the internship experiences of fresh graduates across all three qualification levels. Instead, the majority of employers assess internship quality based on the skills acquired by candidates from their internship stints.

There Is No One-Size-Fits-All Résumé

Our findings underscore the importance for fresh graduates to adeptly showcase their skills, including those attained through internships, to prospective employers.

Given the pivotal role that skills play in influencing employers' hiring decisions, it is essential for fresh graduates to emphasise and draw employers' attention to their skills and strengths within their résumés (Lim, 2022). Especially in today's fiercely competitive talent landscape, résumés that are adroitly tailored to the specific position can give individuals an edge over the others, thereby boosting their prospects of advancing through the application process.

Moreover, such résumés allow fresh graduates to present a stronger case to employers for higher salaries. According to SNEF's survey, nearly one in four is willing to offer higher starting salaries to outstanding fresh graduate candidates who demonstrate relevant skills.

As employers in Singapore shift towards skills-based hiring, it is therefore key for fresh graduate candidates to frame their skills and competencies strategically to showcase to employers the value they can bring to the role and organisation (Tandon, 2023; Yang, 2021). That said, fresh graduates should also take care not to overstate their skills and accomplishments or provide misleading information in their résumés, as such embellishments could have negative consequences (Lim, 2022).

Push for Tighter Nexus Between Education and Industry

The findings of this study have implications for IHLs and employers as well. Employers in SNEF's survey have indicated a preference for longer internships, stating that internships shorter than 12 weeks may fail to provide students significant and meaningful exposure. This view is supported by a systematic review of literature on the effectiveness of internships as a bridge to stable employment, which found that longer internships enhance students' likelihood of acquiring tangible skills and competencies (O'Higgins & Pinedo, 2018). In Singapore, students enrolled in IHLs primarily engage in internships during their semester or vacation periods, which typically span over a period of around 8–12 weeks.[5] Thus, to assess whether a longer internship period beyond 12 weeks is viable, several factors, such as the availability of students and its potential impact on the curriculum and academic requirements, need careful consideration.

Nonetheless, regardless of internship duration, employers should continue to provide meaningful and hands-on opportunities for interns to develop valuable skills and experience. Evidence shows that structured internships improve students' learning experiences (O'Higgins & Pinedo, 2018). Therefore, to ensure meaningful internship outcomes for both students and employers, employers are strongly encouraged to develop structured work plans with clear deliverables and provide mentorship guidance to interns (Chartered Institute of Personnel and Development, 2022). At the same time, students too should show initiative and make the most out of their internship.

The survey findings also emphasise the pressing need for closer ties between IHLs and employers, to ensure continued relevance of academic curricula with prevailing business needs.

To this end, SNEF has partnered with Singapore Polytechnic to set up a new career services centre by 2024 and connect polytechnic and ITE students with employers (Teng, 2023). Additionally, SNEF is currently working with Temasek Polytechnic and selected member companies to co-develop an internship programme for students who aspire to have a career in Human Resource (Singapore National Employers Federation, 2023).

For Singapore to remain relevant and competitive in the new economy, SNEF, as the national trade union for employers, will continue to work with IHLs, tripartite partners, as well as industry partners to equip students and the workforce with the latest industry-relevant knowledge and skills.

Limitations and Future Research

Our survey respondents' industry profiles are not nationally representative due to limited participation from the following industry clusters: Aviation (1.9%), General Manufacturing (1.9%), Pharmaceutical & Health Science (2.4%), Transport & Logistics (2.4%), Chemical (2.9%), and Retail Trade (2.9%). Future research could consider a larger sample size to provide a holistic representation of Singapore's employment landscape. Since a majority of our respondents were Human Resource practitioners, future research could also include more line managers and management-level representatives who have direct oversight over hiring decisions.

[5] The duration of credit-bearing internships varies depending on the student's course of study and the requirements of their respective IHL. Nitec/Higher Nitec students at ITE are required to undergo internships lasting between 10 weeks and 20 weeks. Polytechnic diploma students engage in internships ranging from 7 weeks to 44 weeks. For university undergraduate students, their internship varies from 4 weeks to as long as 1 year. For non-credit-bearing internships, there are no requirements on the duration, and it depends on the student's and employer's availability.

Conclusion

SNEF conducted a survey involving 208 employers to understand their perceptions and considerations in recruiting fresh graduates for entry-level positions. Our findings show that majority of employers prioritised internship experiences, alongside course of study and skills, when evaluating the work-readiness and potential of fresh graduate candidates.

However, it is important to note that not all internships are made equal, which presents a challenge for employers in assessing the relevance and quality of fresh graduates' internship experiences. SNEF's study underscores employers' preference for quality, rather than quantity, of internships.

Given that employers assess internship quality based on the skills acquired by candidates, it is imperative for fresh graduates to tailor their résumés and highlight their skill sets effectively. By strategically framing their skills, fresh graduates make a compelling case to prospective employers about their suitability for the role.

Moreover, there is a call for a tighter nexus between IHLs and employers to ensure that academic curricula continue to remain relevant to the evolving needs of the industry. SNEF is committed to fostering these close partnerships with tripartite partners, IHLs, and industry stakeholders to equip students and the workforce with the necessary skills for a future-ready economy.

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REFERENCES

Ang, H. M. (2022, January 7). *More industry exposure, flexible curriculum for polytechnic and ITE students among proposals by review panel*. CNA. https://www.channelnewsasia.com/singapore/polytechnic-ite-higher-nitec-review-internship-2420101

Chartered Institute of Personnel and Development. (2022, March 7). *Internships that work: Guide for employers*. https://www.cipd.org/en/knowledge/guides/internships-guide/

Gault, J., Redington, J., & Schlager, T. (2000). Undergraduate business internships and career success: Are they related? *Journal of Marketing Education*, *22*(1), 45–53. https://doi.org/10.1177/0273475300221006

Gray, K. (2022, January 7). *Internship experience the most influential factor in tough hiring decisions.* National Association of Colleges and Employers. https://www.naceweb.org/talent-acquisition/candidate-selection/internship-experience-the-most-influential-factor-in-tough-hiring-decisions/

Kapareliotis, I., Voutsina, K., & Patsiotis, A. (2019). Internship and employability prospects: Assessing student's work readiness. *Higher Education, Skills and Work-Based Learning*, *9*(4), 538–549. https://doi.org/10.1108/heswbl-08-2018-0086

Lim, F. (2023, July 25). *Commentary: Are undergraduates under pressure to chase multiple internships?* CNA. https://www.channelnewsasia.com/commentary/internship-arms-race-university-students-undergraduate-career-work-attachment-3625956

Lim, J. (2022, January 12). *Commentary: Fresh grads, don't give into temptation to inflate your resumes.* CNA. https://www.channelnewsasia.com/commentary/resume-write-tips-job-apply-cover-letter-cv-graduate-school-education-qualification-2387056

Maertz, C. P. J., Stoeberl, P. A., & Marks, J. (2014). Building successful internships: Lessons from the research for interns, schools, and employers. *Career Development International*, *19*(1), 123–142. https://doi.org/10.1108/cdi-03-2013-0025

Ng, J. (2024, January 21). Interning at funeral home: Students may benefit from attachments unrelated to future careers. *The Straits Times*. https://www.straitstimes.com/singapore/parenting-education/interning-at-a-funeral-home-students-may-benefit-from-attachments-not-related-to-future-careers

O'Higgins, N., & Pinedo, L. (2018, August 9). *Interns and outcomes: Just how effective are internships as a bridge to stable employment?* International Labour Organization. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_637362.pdf

Randstad. (2024, February 6). *2024 job market & salary guide report: Singapore*. https://www.randstad.com.sg/s3fs-media/sg/public/2024-02/randstad-singapore-market-outlook-salary-guide-2024-digital-report.pdf

Singapore National Employers Federation. (2023, August 2). *Singapore National Employers Federation and Temasek Polytechnic sign MOU on structured human resource student internship*. https://snef.org.sg/snef_news/singapore-national-employers-federation-and-temasek-polytechnic-sign-mou-on-structured-human-resource-student-internship/

Tandon, R. (2023, December 11). Are unrelated internships a hindrance or an advantage? This is what experts have to say. *The Economic Times*. https://economictimes.indiatimes.com/jobs/fresher/are-unrelated-internships-a-hindrance-or-an-advantage-this-is-what-experts-have-to-say/articleshow/105898223.cms

Tay, H. Y. (2023, August 24). askST Jobs: How important is prior internship experience? *The Straits Times*. https://www.straitstimes.com/askst/askst-jobs-how-important-is-prior-internship-experience

Teng, A. (2021, January 25). Compulsory internships for all NTU undergraduates starting this year. *The Straits Times*. https://www.straitstimes.com/singapore/parenting-education/compulsory-internships-for-all-ntu-undergraduates-starting-this-year

Teng, A. (2023, October 31). Singapore Polytechnic marks upcoming 70th anniversary with book documenting its journey. *The Straits Times*. https://www.straitstimes.com/singapore/singapore-polytechnic-marks-upcoming-70th-anniversary-with-book-documenting-its-journey

Yang, C. (2021, August 14). New initiative to hire S'pore workers based on skills, instead of past qualifications, titles. *The Straits Times*. https://www.straitstimes.com/singapore/jobs/new-initiative-to-hire-spore-workers-based-on-skills-instead-of-past-qualifications

Yeo, S. (2023, August 6). Gen Z interns: She did five internships in three years to figure out what she wanted. *The Straits Times*. https://www.straitstimes.com/singapore/parenting-education/gen-z-interns-she-did-five-internships-in-three-years-to-figure-out-what-she-wanted

Yuen, D. (2019, October 1). *Gen Y speaks: Why I took on more internships than others*. TODAY. https://www.todayonline.com/commentary/gen-y-speaks-why-i-took-more-internships-others

PRACTITIONERS' INSIGHTS

Forward Singapore: Strengthening SkillsFuture

Chelvin Loh and Wee Siong Yeo

Abstract

This practitioner note provides an overview of developments in the SkillsFuture movement. Particularly, it details how innovations in the skills ecosystem are shifting lifelong learning to a higher gear and enabling greater ownership of one's skills and career health. Frequent tech disruptions, shortened half-life of skills and knowledge, and new job roles emerging every day mean our workforce must retool at scale and at speed. To be nimble and adaptable enough to support the timely reskilling and upskilling of Singapore's 2.5 million resident workforce, SkillsFuture Singapore is working with training, industry, and tripartite partners to enhance the understanding of what skills we need as a national workforce, and use this knowledge as an advantage to stay ahead of the curve. However identifying skills in demand is not enough in this dynamic job market. To achieve agility and responsiveness of the skills ecosystem, there are collective efforts with industry leaders, training providers, and skills-tech providers to strengthen the skills demand-supply coordination. As part of the Forward Singapore agenda, this collective awareness of skill trends and enhanced demand-supply coordination will ultimately strengthen Singapore's competitive advantage, and workforce mobility and resilience.

Introduction: SkillsFuture—A Key Pillar of Singapore's Social Compact

The launch of the SkillsFuture movement in 2015 marked the fourth phase in Singapore's Continuing Education and Training landscape. It is Singapore's national response to challenges in the external environment and a deliberate national strategy to equip all Singaporeans with the skills to drive its next phase of economic development. For individuals, it helps them make well-informed choices in education, training, and careers. For training providers and trainers, it serves to develop an integrated, high-quality system of education and training that responds to constantly evolving industry needs. For employers, it helps to promote employer recognition and career development based on skills and mastery. For the nation, it fosters a culture that supports and celebrates lifelong learning.

To succeed, this lifelong learning ecosystem requires significant coordination across different stakeholders. The then-Senior Minister Mr. Tharman Shanmugaratnam said at the Singapore Perspectives 2021 Conference that "employers, on their own, will typically want to train their workers for today's job, to be as efficient as possible for today's job. They do not have a particular incentive to train workers for their next career. That is why we need public-private coordination, we need the unions involved, so that we find the right balance between helping firms have a competitive and skilled workforce for today, and helping individuals stay competitive for the future" (Shanmugaratnam, 2021). These challenges are not unique to Singapore. Large numbers of people across the globe are excluded from the labour market because they lack the right qualifications and skills to land well-paid quality jobs (Moritz & Zahidi, 2023). With frequent tech disruptions, the shortened half-life of skills and knowledge, and new job roles emerging every day, upskilling or reskilling to ensure relevance and competitiveness has become more important than ever before.

This emphasis on improving pathways to better jobs and work is therefore a key pillar of Singapore's refreshed social compact that forms part of the national Forward Singapore exercise. Launched in June 2022, the Forward Singapore exercise is a nationwide effort to gather views from citizens, enterprises, and stakeholders on the roadmap for Singapore's next stage of development. Priorities include doubling down on investments in Singapore's skills and training ecosystem, improving labour market information, and strengthening labour market intermediaries so that there can be better matching of jobs and workers. To build a skills ecosystem that is agile and responsive to the needs of individuals and enterprises, enterprises also need to play a more proactive role in the training of their workforce and encouraging more training that leads to recognised, verifiable credentials. Training providers, on the other hand, need to develop and deliver more innovative training programmes, including curating work-based learning options that can lead to better employment and earning outcomes. As the next building block of the SkillsFuture movement, helping citizens proactively manage their "career health" will be key. By providing workers with easy access to their own data on their skills and competencies, as well as the areas of future industry demand and growth, they can be empowered to take greater responsibility to plan their own careers.

Ecosystem Approach to Articulate, Aggregate, and Activate Skills

As the national skills authority, SkillsFuture Singapore (SSG) has been working closely with sector agencies, enterprises, academia, and tripartite partners to articulate, aggregate, activate, and monitor skills (see Figure 1). To support skills identification, the Skills Framework was launched in 2016 to establish a common skills language. Organised with a sectoral lens, these frameworks identify a set of Technical Skills & Competencies and Critical Core Skills, as well as the accompanying proficiency levels, knowledge, and abilities to facilitate career progression and job mobility within each sector (see Figure 2). Each of these sectoral Skills Frameworks also provides the granularity needed to support course-to-skills mapping, Workforce Skills Qualifications accreditation, and industry standards (including licensing and other regulatory standards). Today, there is comprehensive sectoral coverage of 35 sectors, with jobs and skills comprehensively covering more than two thirds of our workforce. These skills in demand are then disseminated to Institutes of Higher Learning and training providers to activate relevant Continuing Education and Training programmes and skills-based credentials to meet the market

needs. Workers are trained with the right skills (including learning at the workplace) and enterprises are able to recognise the credentials and certifications in their hiring, talent, and development, thereby completing the entire value chain of training.

Figure 1

Ecosystem Approach to Articulate, Aggregate, and Activate Skills

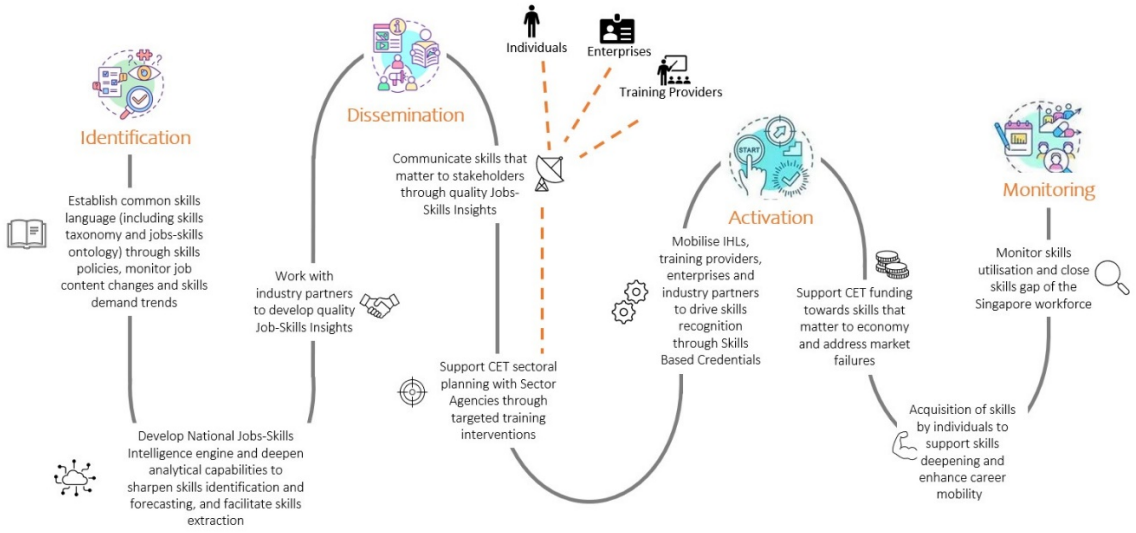
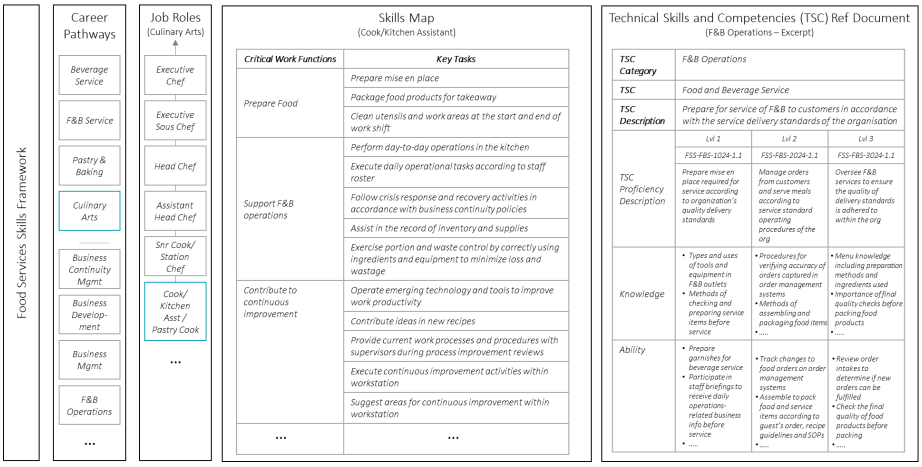


Figure 2

Components of a Skills Framework: Food Services Skills Framework—Excerpt



Note. Adapted from Skills Frameworks to support the Industry Transformation Maps, by SkillsFuture Singapore, n.d. (https://www.skillsfuture.gov.sg/skills-framework).

Staying Ahead of Changes in Jobs and Skills

Beyond tapping on experts' views, SSG is also leveraging big data from labour market intelligence and machine learning to monitor job content and skills demand changes. Specifically, data from multiple sources, including Skills Frameworks, job posting data, CV data, course data, and training consumption data, are processed, analysed, and updated dynamically in the National Jobs-Skills Intelligence Engine. The National Jobs-Skills Intelligence Engine uses the National Jobs-Skills Ontology and Singapore Skills Taxonomy to enable the development of data dashboards, data science models, and insights that can be used by SSG, industry partners, Institutes of Higher Learning, and training providers (see Figure 3). For instance, the Skills Extraction Algorithm and Skills Search Algorithm allow users to extract skills from unstructured text to analyse skills demand and supply changes on a real-time basis. Graph databases, such as the Jobs-Skills Knowledge Graph, link data across sources of different types, allowing users to explore neighbourhoods and pathways between occupations and skills, uncovering the relationships that occupations have with skills to quantify occupation similarity. By exploring the interconnected relationships between jobs, skills, and courses (see Figure 4), these graph databases can uncover new insights, including optimising multistep career transition pathways and combinations of courses that individuals can undergo to make these transitions. Together, these tools will support more targeted education and career guidance, skills and training advisory, and career coaching efforts.

Figure 3

National Jobs-Skills Intelligence Engine

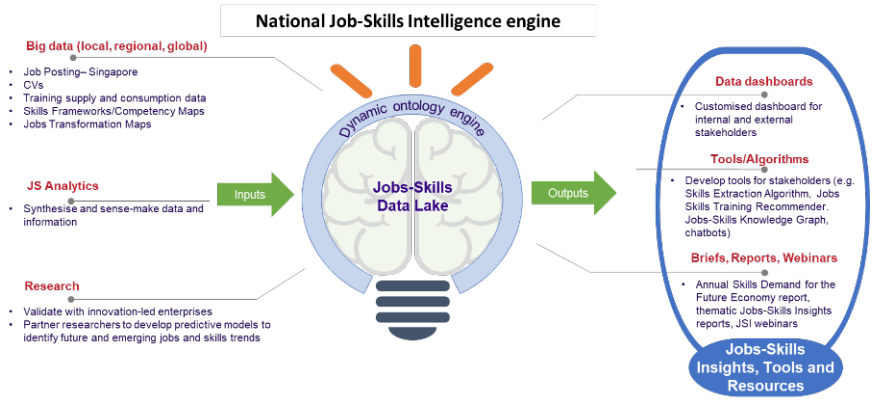
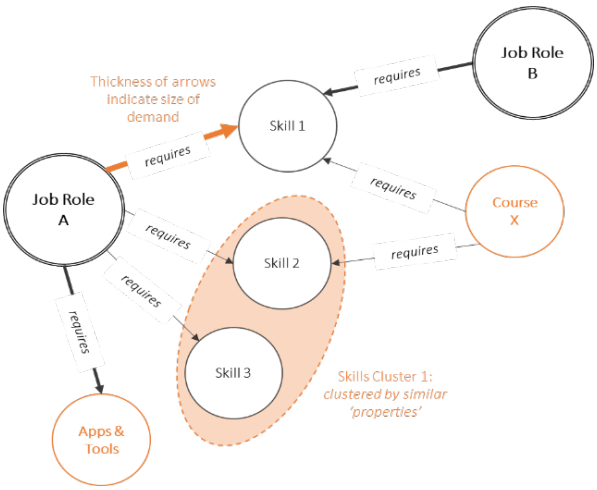


Figure 4

Visual Representation of Jobs-Skills Knowledge Graph



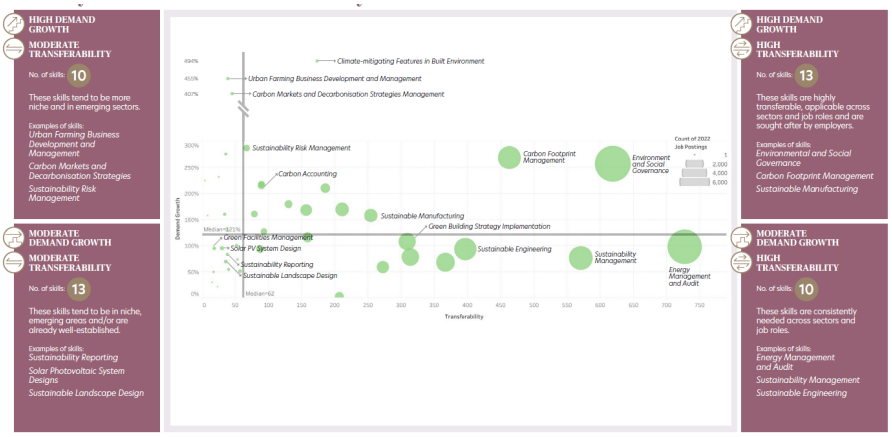
From 2024, SSG will also be availing these jobs-skills tools and labour market intelligence to industry partners and training providers to refresh and enhance the national Skills Framework to be more agile and user-friendly. This is in response to the fast-changing jobs-skills landscape and the need to better empower our workers with intel information that can help them identify career transitions across sectors. By helping our workers, especially the career transitioners, identify their transferable skill and cross-sector skill adjacencies, this will also allow them to access progression pathways outside their immediate sector/job role and enhance their career mobility based on their skills. These tools, together with targeted insights on job and skill trends, can also help training providers to activate the training supply, such as industry-relevant courses, in a more timely manner, increasing their speed to market to serve enterprise and workforce needs.

Raising Skills Literacy of Individuals, Enterprises, and Skills Ecosystem Partners

Raising the level of understanding on how skills matter to the "health" of individuals, enterprises, and industries is key. Since 2021, SSG has been analysing jobs-skills data and presenting insights in an easy-to-understand manner to signpost and educate stakeholders on how skills relate to the changing economy and jobs landscape. These insights have been presented in various reports. The annual Skills Demand for the Future Economy report spotlights the skills that citizens and enterprises should prioritise based on skills demand growth and skills transferability, especially in high-growth areas and job roles within the Green, Digital, and Care Economy (see Figure 5). Each year, different ways to interpret trends in skills are explored and presented, to demonstrate that skills demanded in the economy are not stagnant, and hence, highlighting the importance of upskilling and reskilling. The report helps individuals understand the market pulse for these skills and make informed decisions on what skills they should invest in. In the 2023/2024 edition, career mobility planning was featured through the analysis of six in-demand job roles to show that some roles are better suited for career transitioners compared to others. Individuals can chart these pathways by bringing themselves first into a job adjacent to these desired roles and use Career Conversion Programmes and SkillsFuture Career Transition Programmes to make the career transition (see Figure 6).

Figure 5

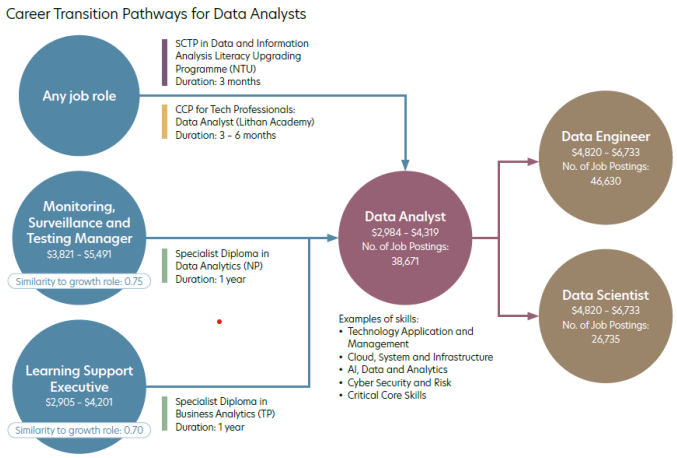
Priority Skills in the Green Economy: 2019–2022



Note. Adapted from *Skills Demand for the Future Economy 2023/24*, by SkillsFuture Singapore, 2023 (https://www.skillsfuture.gov.sg/docs/default-source/skills-report-2023/sdfe-2023.pdf).

Figure 6

Career Mobility Planning: A Multistep Approach



Note. Adapted from *Skills Demand for the Future Economy 2023/24*, by SkillsFuture Singapore, 2023 (https://www.skillsfuture.gov.sg/docs/default-source/skills-report-2023/sdfe-2023.pdf).

Other bite-sized Jobs-Skills Insights include thematic and sectoral reports co-developed with industry and tripartite partners (see Figure 7). These reports focus on skill changes in specific sectors or professions, or the impact of broader trends such as Artificial Intelligence or the green agenda on skills and jobs (e.g. Economic Development Board, 2023; Institute for Human Resource Professionals & SkillsFuture Singapore, 2024). By demystifying how skills are impacted, the reports further illustrate what actions can be taken to close the skill gaps through SSG's support schemes, programmes, and initiatives.

Figure 7

Jobs-Skills Insight Reports by SSG and Partners

Conclusion

At the Singapore Budget Speech 2024, then-Deputy Prime Minister and Minister for Finance Lawrence Wong reiterated the need for continuous skills upgrading and the critical role of SkillsFuture as a key pillar in Singapore's social compact. In his words, "Ours must always be an economy that provides opportunities for all; an economy that benefits the many rather than the few. This is why we are making significant enhancements to SkillsFuture, and supporting jobseekers while they search for their next opportunity. We believe that every worker matters; that every citizen counts. We will equip every Singaporean to benefit from the fruits of our economic growth" (Wong, 2024).

As part of the Forward Singapore agenda, enterprises, industry partners, training providers, and the Singapore Government must work hand in hand to ensure Singapore's knowledge and skills currency remain updated to meet the needs of the market. To stay in the race and keep moving forward, Singaporeans and local companies must upskill and reskill continuously, and they must feel empowered to do so. SSG will work with all parties to strengthen our collective efforts in identifying emerging skill needs and gaps, to help individuals in their lifelong learning, to guide employers in their workforce development, and to keep Singapore competitive and future ready. The need for a whole-of-nation effort, to develop the collective awareness of skill trends and support one another in the continual skills development journey, has never been more important. To this end, SSG also welcomes international collaborators to partner us on this endeavour, to contribute to the global agenda on jobs and skills, and expand on our shared knowledge, intelligence, and networks.

BIOGRAPHIES

Chelvin Loh

Ms. Chelvin Loh is currently the Director of Skills Intelligence and Planning Division in SkillsFuture Singapore, a statutory board under the Ministry of Education. She leads a team of skills policy officers, data analysts, and data scientists to chart policies that can support and lead SSG's skills innovation efforts, including the transformation of our national Skills Framework, skills-based credentialing, and leveraging machine learning and AI to power our National Jobs-Skills Intelligence Engine. Prior to SSG, Chelvin was part of the management team driving Small and Medium Enterprise development, human capital development, and internationalisation in Enterprise Singapore/ SPRING Singapore and International Enterprise Singapore.

Wee Siong Yeo

Mr. Wee Siong Yeo is the Director of Jobs-Skills Insights Division at SkillsFuture Singapore, which is a statutory board under the Ministry of Education. He leads a team of Jobs-Skills Analysts that examine jobs-skills changes in Singapore's economic and industry landscape arising from technology disruptions, business model innovations, new care models, and other emerging trends. Forming close partnerships with sector agencies, tripartite partners, training providers, and innovation-led firms, his team develops fit-for-purpose and timely jobs-skills insights to signpost changing job and skill trends to individuals and enterprises. Prior to joining SSG, Wee Siong held various appointments at the Ministry of Education. He oversaw the policy, planning, and execution of student placement policies and admissions, and the various talent development schemes in schools and junior colleges.

REFERENCES

Economic Development Board. (2023). *Singapore Supply Chain Management (SCM) skills plan*. https://www.skillsfuture.gov.sg/docs/default-source/initiatives/skills-plan/scm-skills-plan_final-(published).pdf

Institute for Human Resource Professionals & SkillsFuture Singapore. (2024). *SkillsFuture Jobs-Skills Insights—Charting a new HR course: Success through digital transformation*. https://www.skillsfuture.gov.sg/docs/default-source/initiatives/sf-jsi/sfjsi-w-ihrp_jan2024.pdf

Moritz, B., & Zahidi, S. (2023, May 22). *Adopting a 'skills-first' approach could help more than 100 million people worldwide get better jobs*. World Economic Forum. https://www.weforum.org/agenda/2023/05/adopting-a-skills-first-approach-help-people-better-jobs/#:~:text=A%20skills%2Dfirst%20approach%20focuses,productivity%2C%20economic%20growth%20and%20resilience

Shanmugaratnam, T. (2021). *Singapore Perspectives 2021 "Reset"*. Institute of Policy Studies. https://lkyspp.nus.edu.sg/ips/events/details/singapore-perspectives-2021-reset

SkillsFuture Singapore. (2023). *Skills Demand for the Future Economy 2023*. https://www.skillsfuture.gov.sg/skillsreport

Wong, L. (2024). *Budget 2024 speech*. https://www.mof.gov.sg/docs/librariesprovider3/budget2024/download/pdf/fy2024_budget_statement.pdf

Empowering the Next Generation: Navigating Challenges and Opportunities in the Modern Workforce Through Coaching and Mentorship

Sok Mui Lim and Yaacob Ibrahim

Abstract

Each workforce generation grapples with distinctive challenges, and the contemporary job market introduces new complexities with the integration of artificial intelligence. The impact of artificial intelligence on organisational productivity is noteworthy, especially as it provides opportunities for lower-skilled workers to enhance their capabilities, albeit with potential implications for the development of tacit knowledge. Despite prevailing generational judgements, insights from various studies and reports reveal that the younger generation in Singapore values workforce acceptance and hard work, and exhibits resilience. Concurrently, the 2022 National Population Health Survey by the Ministry of Health highlighted a significant proportion of individuals aged 18–29 years experiencing poor mental health. Managing the well-being and productivity of the younger workforce becomes crucial, with the introduction of a growth mindset offering a potential solution. A growth mindset refers to the belief in one's capacity for development and the malleability of human attributes. Three key strategies are identified for fostering a growth mindset and well-being in the workforce: regular constructive feedback, organisational responses to project failures, and adopting a "not yet" approach to unmet goals. Furthermore, the implementation of workplace coaching and mentoring emerges as a strategic solution, targeting individual and organisational performances, and sustainable well-being. Within workplace coaching, bridge mentoring is proposed to address diversity gaps and positively impact employee learning and development.

Introduction

It is a common tendency for each generation to pass judgements on the succeeding one. The youth and younger workers of today often find themselves labelled as entitled, soft, overly emotional, or even spoiled by their predecessors, coining terms like the "strawberry" or "snowflake" generation. From 2022–2023, the National Trades Union Congress (NTUC) Youth Taskforce reached out to 10,568 individuals aged 17–25 years, culminating in the release of the insightful "The New Generation Worker" Report 2023 (NTUC Youth Taskforce, 2023). This comprehensive report emerged from a year-long interaction with youths and various stakeholders, posing important questions such as: "Will the workforce I am stepping into accept me for who I am?"

As we prepare a younger generation for the challenges of work and the pursuit of success, it becomes imperative to scrutinise existing practices and question assumptions that might warrant change. There exists a dichotomy in expectations—on the one hand, the suggestion that younger workers should exhibit contentment rather than excessive ambition, and on the other, the call for them to be hungrier, bolder, and more enterprising to ensure Singapore's competitiveness in the future. Balancing these contrasting work values is no easy feat, often necessitating role modelling or mentorship.

A noteworthy 6-year longitudinal study conducted by the Institute of Policy Studies Social Lab and the National Youth Council under the Youth Study on Transitions and Evolving Pathways in Singapore (Youth STEPS) initiative explored the transitions and pathways of Singaporean youth. Data from the study of about 3,000 Singaporean young people suggested that many emerged from the Coronavirus disease 2019 (COVID-19) pandemic with resilience and turned crisis into opportunity (Chew & Chua, 2022). While overall mental health has clearly taken a hit, their resilience post-pandemic debunks the stereotype of an overly delicate "strawberry" generation.

In another long-term study, the Youth Study on Transitions and Evolving Pathways in Singapore was conducted by the National Youth Council and the Institute of Policy Studies. It involved 4,000 young people aged 17–24 years (Chua, 2019). They were asked to prioritise values and factors to succeed (on a scale of 1–7, with 7 being the highest priority, while 4 is neither important nor unimportant). Singaporean youth rated attitude and values (6.49), hard work (6.17), drive and ambition (5.99), and having relevant skills (5.66) as the most important factors to succeed. These were ranked much higher than studying in a good school or one's family background, suggesting that these young Singaporeans value personal agency and understand the need to strive and put in effort. Such results are contrary to the "entitled" label some have generalised them with.

In revisiting the insights from "The New Generation Worker" Report 2023, a surprising revelation emerged from the responses of 723 youths asked to define personal success. Contrary to stereotypes, most defined success as "contentment" (22%), followed by "relationships" (16.9%), "wealth" (16.2%), and "aspirations" (11.6%). The quest for work-life balance took precedence, emphasising flexibility in work schedules and an equitable division of time between professional and personal spheres (NTUC Youth Taskforce, 2023). This new generation of workers, characterised as true-blue digital natives, not only emphasised the importance of finances and career aspirations but was also vocal about mental well-being and health.

The Need for Healthy Understanding Between Younger and Older Generations of Workers

A common perception among the older generation is that young people today are more vocal, and they tend to have views on almost every aspect of life (Carnegie, 2022; Siegel, 2023). This gap among the generations can be understood in terms of the range of opportunities available to young people to engage and connect. With the widespread use of social media and the availability of the Internet, young people today can connect and engage more widely. However, the perception among some older people is that the constant airing of views by young

people amounts to complaining about the different aspects of life (Lloyd, 2023). This may be an overgeneralisation or stereotype of young people. Putting on a different lens, we can view being vocal and speaking up as positive effort towards wanting to make a difference.

To better support the next generation of workers, it is imperative to reduce judgement, eliminate stigma, and recognise their distinct needs, learning preferences, and definitions of success. Often, in drawing parallels with the methods of previous generations, the older generation might unintentionally overlook the unique struggles faced by today's Singaporean younger workers and the inherent strengths they bring to the table. Generational differences sometimes play out in many ways. The older generation, assumed by many in different societies as wiser and more experienced than the younger generation, is ready to pass on life lessons to the younger generation. The younger generation with new experiences unfamiliar to the older generation tends to see the latter as not in sync with current practices. This sense of disconnect between the two generations is compounded by a sense of superiority on the part of the older generation with respect to their life experiences. For example, the older generation perceives the younger generation as less resilient than their generation. This perception is compounded by the sense that the younger generation has it better compared to the older generation. Such attitudes between the two generations will impede constructive sharing of experiences between them.

An attitude of wanting to understand each other's perceptions can be a good start to a healthy relationship. Both generations have something to contribute to the conversation. Only an open mind and a healthy curiosity of the other can facilitate intergenerational engagement and understanding. To develop a strong new generation of workers, learning across generations is necessary. What is needed is a healthy attitude of respect and understanding between the generations for this to happen.

Starting Work in a Different World With Artificial Intelligence

We must acknowledge that younger workers have different needs and different strengths. In addition, they are experiencing a distinctive era marked by the unparalleled pace of change propelled by rapid technological advancements. Unlike the past, where older generations might have possessed superior knowledge or mastered a process of doing things successfully, the advent of artificial intelligence (AI) further complicates this dynamic.

One may ponder whether artificial intelligence functions as an equaliser, a facilitator of expertise, or a catalyst for advancement within the workforce. As younger individuals enter the job market, the following question arises: Could their learning curve be shorter when aided by artificial intelligence in tasks? In a real-world experiment, Brynjolfsson et al. (2023) examined the phased implementation of a conversational assistant powered by generative artificial intelligence, utilising data from 5,179 customer support agents. Results from this practical experiment revealed a 14% average increase in productivity, measured by the number of issues resolved per hour. Notably, novice and low-skilled workers experienced a significant 35% improvement, while the impact on experienced and highly skilled workers was minimal. The findings suggested that the artificial intelligence model had the potential to share the best practices of more proficient workers, aiding newer employees in progressing along the learning curve. Such a result is not only limited to lower-skilled jobs.

Dell'Acqua et al. (2023) conducted a study involving highly skilled knowledge workers at the Boston Consulting Group. Through a series of 18 tasks designed to assess various business skills, spanning from analysis and idea generation to persuasion, the consultants who had previously demonstrated lower proficiency increased the quality of their outputs by 43% with artificial intelligence assistance, while those in the top half experienced a 17% improvement. The prior 22% performance gap between the average achievements of the top and bottom performers narrowed significantly to just 4% when consultants utilised GPT-4. In the two examples discussed, artificial intelligence acted as a skills leveller, raising everyone to a minimum level of performance.

In contrast to earlier generations, where experiential learning on the job and application of educational knowledge in the workforce were primary avenues for skills development, the

introduction of artificial intelligence into the professional landscape presents a dual landscape for today's younger workers. Findings from the studies conducted by Dell'Acqua et al. (2023) and Brynjolfsson et al. (2023) underscored the transformative potential of artificial intelligence technologies in expediting skills acquisition and elevating productivity for individuals entering the workforce with limited experience. These tools can effectively streamline learning curves, enhance task performance, and facilitate the dissemination of best practices. Conversely, younger workers who choose not to embrace or leverage artificial intelligence tools may find themselves at a competitive disadvantage, both in terms of productivity and skills enhancement, when compared to peers who harness these technologies. Surprisingly, a recent study by Ernst & Young revealed that younger workers in the US are actually using artificial intelligence on the job less than Gen X and millennials (Mok, 2024). One reason suggested by the researchers is that Gen Zers seem to trust artificial intelligence less than older workers, and are sceptical that artificial intelligence can add real value. In summary, while artificial intelligence offers substantial advantages for professional development, the failure to adopt such tools among younger workers could lead to missed opportunities and impede career progression.

Explicit knowledge is information that is clearly expressed and easily shared among individuals, often through formal documentation. In contrast, tacit knowledge resides within the minds of employees, stemming from experiential learning on the job and often proving challenging to articulate (Smith, 2001). This form of knowledge encompasses personal wisdom, intuition, and insights. While artificial intelligence excels at processing explicit knowledge, its effectiveness is limited when handling the more subjective and experiential aspects of tacit knowledge. Tacit knowledge includes skills acquired through experience, making it crucial for younger workers to grasp the distinction between explicit and tacit knowledge. Merely relying on technology may fall short in supporting them. It is essential to guide them in discerning when to leverage technology and artificial intelligence versus seeking guidance from experienced staff members who possess valuable insights from their own journeys.

Cultivating a Growth Mindset and Well-being in the Workplace

One noteworthy insight from "The New Generation Worker" Report 2023 by the NTUC Youth Taskforce concerns mental well-being. The Ministry of Health (2023) recently disclosed the outcomes of the 2022 National Population Health Survey, revealing that the age group of 18–29 had the highest proportion of individuals experiencing poor mental health at 25.3%. Encouragingly, there has been a reduction in the stigma surrounding mental health conditions, leading to an increased willingness to seek help when needed. Young people have become more outspoken and genuinely concerned about the escalating stressors in their work environments and the deteriorating mental well-being observed among themselves and their peers. Despite workplaces predominantly emphasising productivity and developmental opportunities, these objectives are unattainable without a healthy workforce. According to NTUC's focus group findings (NTUC Youth Taskforce, 2023), young workers propose implementing clear work boundaries, offering counselling services, establishing helpline initiatives, and introducing peer support in workplaces as measures to promote mental well-being. Beyond these measures that are reported, cultivating a growth mindset around work and performance can promote mental well-being.

While much discourse revolves around fostering a growth mindset culture in the workplace for learning purposes (Freeman, 2023), there is less research linking a growth mindset to mental well-being. A growth mindset, defined as the belief in one's capacity for development and the malleability of human attributes, contrasts with a fixed mindset that views these attributes as unchangeable. Research suggests that a growth mindset underpins an individual's self-regulation, resilience, and proclivity for embracing challenges (Dweck & Leggett, 1988; Dweck, 2006). A study in China involving 2,505 college students found that those with a growth mindset scored significantly lower on "mental health issues" and "stress due to life events" compared to students with a fixed mindset (Tao et al., 2022). The researchers proposed that individuals with a growth mindset are more likely to take initiative, devise strategies to adjust their thoughts, adapt their goals over time, and maintain an optimistic and positive attitude. In contrast, those with a fixed mindset may rigidly adhere to goals under pressure, experiencing increased stress and

negative emotions if they fail to achieve them.

We suggest strategies for fostering a growth mindset and supporting mental well-being at the workplace, particularly in guiding younger workers. First, regular feedback is instrumental in guiding their professional development. Constructive feedback serves as a compass, guiding employees towards growth opportunities. By incorporating feedback loops into the workplace, organisations can empower younger workers to navigate their career paths more effectively, building resilience and adaptability. Receiving supportive and constructive feedback enhances the mental well-being of staff, particularly in contrast to forming uninformed assumptions about one's performance and the employer's expectations, a tendency that may trigger rumination and contribute to low mood.

Second, an organisation's response to project failures or mistakes is pivotal—adopting a learning attitude transforms setbacks into valuable opportunities for growth and innovation. Cultivating a culture that appreciates insights gained from unsuccessful endeavours fosters resilience and prevents workers from succumbing to highly stressful and negative emotions. Instead of viewing failures as dead ends, reframing setbacks as stepping stones towards improvement encourages a growth mindset that propels the workforce forward. This is particularly essential for younger workers who may find mistakes and failures more daunting due to their limited past work experience and examples to refer to regarding potential consequences. Providing guidance and support during such instances becomes crucial for their professional development and mental well-being.

Lastly, adopting the language of "not yet" in response to unmet goals or outcomes encourages a forward-looking perspective. This approach communicates that setbacks are temporary, and with continued effort and learning, success remains achievable. Cultivating a workplace environment that understands the journey to success is iterative and ongoing enhances the mental well-being of employees. It instils a sense of optimism, motivating younger workers to persist in their efforts and view challenges as opportunities for growth. For younger workers who may lack experience in determining realistic timelines and understanding the iterative nature of complex tasks, adopting a "not yet" response becomes especially valuable. This approach helps in developing patience and grit needed for challenging endeavours, fostering a mindset that appreciates the ongoing learning process rather than fixating on immediate outcomes.

By implementing these practices, workplaces can cultivate an environment that not only nurtures a growth mindset but also prioritises the mental well-being of their younger workforce. This approach instils resilience, optimism, and a commitment to ongoing learning, ultimately contributing to the overall success and fulfilment of all employees. "Knowing" is one thing, but "Doing" is what makes things happen. To build a culture that promotes a growth mindset and mental well-being, introducing and knowing these concepts through seminars or lunch time talks may not be enough. Coaching and mentoring within the workplace are essential for employees to implement practices that positively foster a growth mindset and well-being.

Embracing Workplace Coaching and Mentoring

Workplace coaching serves as a strategic tool for professional development, involving a more experienced individual guiding and supporting another to enhance skills, achieve goals, and unlock their full potential within the workplace. The emphasis is on skills development, performance enhancement, and the attainment of specific professional objectives. Grant (2017) delineated the evolution of workplace coaching, with the "first generation" in the 1990s focusing on performance management. The "second generation" in the 2000s shifted towards instructing managers in formal coaching conversations. While attempting a more humanistic and goal-oriented approach, the "second generation" lacked relevance to the daily dynamics of workplace interactions. The "third generation" (2010 and beyond) explicitly aims to improve both individual and organisational performances and well-being sustainably and meaningfully. This approach centres on shifting mindsets and translating principles into action, advocating for the establishment of an ongoing coaching culture that aligns with organisational changes and

requirements. To achieve this, a contextualised, well-developed coaching development programme, coupled with a community of practice, becomes imperative (Lim et al., 2022).

A meta-analysis conducted by Jones et al. (2016) affirmed the positive impact of workplace coaching on employee learning and development in organisations. Their study revealed that coaching yields favourable outcomes in affective areas (e.g., self-efficacy, well-being), skills development (e.g., technical and leadership skills), and individual-level achievements (e.g., goal attainment). Notably, coaching is shown to be more effective when conducted by internal coaches, regardless of whether it takes place face-to-face or incorporates blended techniques. In tandem with this study, a systematic review by Bozer and Jones (2018) delved into a synthesis of quantitative and qualitative research on workplace coaching, offering insights into theoretical constructs operationalised in previous studies. This review illuminates crucial determinants of coaching effectiveness, encompassing self-efficacy, coaching motivation, goal orientation, trust, feedback intervention, and supervisory support. Taken together, these findings underscore the efficacy of workplace coaching, particularly when led by internal coaches and supported by motivated staff possessing clear goal orientation and supervisory backing.

While these studies did not explicitly target coaching for younger workers, they established a foundation for future investigations to assess whether the advantages of workplace coaching extend uniformly to the younger generation as they do to their counterparts. Despite the common association of workplace coaching with high-potential executives, we posit that coaching also holds substantial benefits for younger staff, particularly those who may be less experienced. In this context, an ongoing research study is underway in the Singapore Institute of Technology, with the goal of evaluating the effectiveness of coaching in supporting Information and Communications Technology workplace learners from polytechnic and university backgrounds (Lim, 2023).

Coaching emerges as a potent methodology that facilitates both personal and professional transformation by employing attentive listening, thought-provoking questioning, presenting relevant challenges, and offering unwavering support throughout the individual's journey (Griffiths, 2005). In contrast, mentoring entails an experienced individual sharing knowledge, experiences, and insights with someone less experienced, covering a broad spectrum of personal and professional development, including career guidance and overall growth. NTUC's engagement with youth in 2022 highlighted that career mentorship consistently emerged as a highly valued resource during the transition from school to the workforce and throughout career progression. Mentors were deemed critical in helping youths understand the realities of working life and in constructing their professional portfolios. There was a preference for mentors with whom they could engage openly and informally, providing valuable connections to networking opportunities. Many expressed interests in industry mentors from sectors related to their area of studies. Despite the success of mentoring for many, it should be acknowledged that current mentoring programmes often fall short, particularly in addressing diversity (Brown & Montoya, 2020).

Young professionals hailing from economically stable backgrounds, particularly those in middle and high-income families, often enjoy privileged access to role models within the corporate sphere. Their educational experiences typically involve attending prestigious universities that provide comprehensive disciplines, business development, and leadership curricula, thereby equipping them with essential professional skills for effective organisational communication, networking, and overall success in corporate settings (Gross, 2023). On the flip side, first-generation students from lower socioeconomic backgrounds face an initial disadvantage (Lim & Patel, 2024). Recruiters and hiring managers, influenced by implicit bias, tend to favour candidates who naturally align with their own thinking, work style, lifestyle, and appearance, perpetuating a bias rooted in the concept of "culture fit". This bias extends beyond the selection and hiring process, affecting mentorship, allyship, and advancement opportunities. Traditional mentoring approaches inadequately address their unique challenges.

Bridge Mentoring

Very often, mentoring programmes tend to match mentors and mentees from almost similar background in terms of class and life experiences. While this is useful to facilitate the mentoring exercise, it limits the ranges of mentors and mentees who can come together for mentoring. Ideally, mentoring should be made available across all types of mentors and mentees. This is where bridge mentoring comes in handy. As the term suggests, this type of mentoring attempts to bridge the gaps of class and experiences to bring about a positive mentoring experience.

The concept of bridge mentoring, rooted in bridging social capital across diverse individuals (Gross, 2023), addresses the existing gap. Bridging social capital unites individuals from diverse backgrounds, fostering collaboration, understanding, and resource exchange by bringing together people with varied perspectives and expertise. Bridge mentoring programmes, building upon this idea, aim to address cultural differences in the corporate environment by closing knowledge gaps between minority groups, communities of diverse backgrounds, and the majority group (Gross, 2023).

Bridge mentoring offers a great opportunity for mentors and mentees from very different backgrounds to come together and build a healthy relationship. However, mentoring across class differences and life experiences requires preparations on the part of the mentor. This can be done through workshops and seminars by those who have a good grasp of such differences. The attitudes of the mentor and mentee are important. Mentors should not be quick to judge the mentees and in fact should develop a deep sense of empathy and appreciation of the mentee's life experiences. The saying "put yourself in their shoes" is apt here. On the part of the mentee, he or she must come with an open mind and be willing to learn from those whose life experiences may be different.

In Singapore, bridge mentoring holds potential for young workers who graduated from ITE and polytechnics, as well as those from ethnic minority groups, this could be applied to younger mentees. Case Example 1 illustrates a narrative of bridge mentoring starting from the secondary school level. This approach assists the mentees in navigating towards their career aspirations and building long-term professional relationships that can open doors to various opportunities. As the next diverse generation enters the corporate world, bridge mentoring is poised to play a pivotal role in creating more equitable environments and fostering growth opportunities.

Case Example 1

Narrative of Bridge Mentoring by Professor Yaacob Ibrahim

I started my volunteering experience with Mendaki, the self-help group for the Malay/Muslim community in Singapore. I decided to focus on secondary school students from disadvantaged backgrounds. These students were in what is called neighbourhood schools and in classes for academically weaker students. The key challenge was their sense of motivation to remain in school and complete their secondary school education.

My colleagues and I at Mendaki developed a group mentoring programme where the mentors were young adults just starting out with their careers. We believed that the age gap between the mentors and mentees should not be big. The mentors should be able to relate to the life experiences of the mentees. I was looking for mentors who have that sense of wanting to help the mentees.

The mentoring programme had two components. The first was a group discussion for all mentees on topics of interest to them such as boy-girl relationships and managing parents' expectations. We engaged experts to share with the group and allow for a free-flow discussion to take place. The second component is where the group mentor engaged his or her mentees socially such as having meals and bowling together. We opined that through an informal setting the mentees can be open about their views and share willingly with the group. We found that the key to this is to have mentors who came from similar backgrounds.

The mentoring programme stopped after four years. Interestingly enough, the mentees remained in touch with their mentors and extended the social activities over the years. Today, some of these mentees have become parents but remain in touch with their mentors. The mentoring programme led to a life-long relationship between mentors and mentees. Among the mentees, one very clear outcome was that the mentoring programme provided for them a safe space to engage and share their views. In the words of one mentee, "I never had the opportunity to speak to some elder who understands me".

Conclusion

It is cliché to say that every young generation of people will face different challenges. But it is true as society changes and evolves, bringing with it new opportunities and challenges. While the changes will affect the entire society, young people at the brink of starting a career and a lifetime of employment, will perceive these changes differently from the older and retired generation. The NTUC New Gen Report, developed based on insights gathered by the NTUC Youth Taskforce through year-long engagements with over 10,000 youths and stakeholders. It is an attempt to provide clarity to these challenges faced by younger workers and provide a roadmap for would-be employers to engage and employ these workers. It is only by understanding the views and expectations of younger workers that employers can help to build a culture of trust and support in workplaces. Integrating different types of employees requires a creative approach that helps to empower all types of workers in the workplace.

We underscore the importance of workplace coaching and mentorship for young professionals in Singapore, noting their efficacy in enhancing individual and organisational performance. Meta-analyses and systematic reviews highlight coaching's positive outcomes, particularly when led by internal coaches. However, traditional mentoring programmes may have limitations, necessitating innovative approaches like bridge mentoring. In Singapore, bridge mentoring shows promise for diverse young workers, facilitating career navigation and fostering equitable environments. Yet, implementing these initiatives in organisations poses challenges. Resistance from mentors and mentees due to time constraints and conflicting priorities is common. Additionally, maintaining the quality and effectiveness of coaching and mentoring relationships requires ongoing monitoring and evaluation to ensure programme efficacy.

This paper underscores the myriad challenges and opportunities confronting younger workers within the dynamic and unpredictable job market. These challenges range from navigating conflicting work values, such as finding a balance between contentment and ambitious drive, to discerning the optimal use of artificial intelligence versus seeking guidance from experienced staff. Moreover, the paper delves into the importance of prioritising mental well-being while cultivating a growth mindset, emphasising the ongoing commitment to effort and personal development. Despite the continuous evolution of technology, the enduring value of coaching and mentoring for the more experienced generation in assisting younger individuals in navigating the complexities of the workforce, thriving, and showcasing their potential cannot be overstated.

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BIOGRAPHIES

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Dr. May Lim, an Associate Professor and Assistant Provost at Singapore Institute of Technology (SIT), led efforts in enhancing university-level learning and teaching from 2017 to 2022. She received the Teaching Excellence Award in 2016, 2018, and 2020, alongside the Education 2.0 Outstanding Leadership Award and the National Day Honours: Public Administration Medal (Bronze) in 2022. Passionate about fostering a coaching culture, she focuses on empowering students beyond classrooms. Currently, she champions competency-based education at SIT. With a background in occupational therapy, Dr. Lim is also a certified Solution-Focused Coach, dedicating herself to educational excellence.

Yaacob Bin Ibrahim

Professor Yaacob Ibrahim is currently Adjunct Lecturer at the Lee Kuan Yew School of Public Policy at the National University of Singapore (NUS). He is also an Advisor to the Office of the President of the Singapore Institute of Technology (SIT). He started his career as a practising structural engineer. He then became a faculty member at the NUS after obtaining his Ph.D. from Stanford University. He was member of parliament between 1997 and 2020 and a Minister in the Singapore cabinet between 2002 and 2018. He currently holds various positions in government bodies, unions and private companies.

REFERENCES

Bozer, G., & Jones, R. J. (2018). Understanding the factors that determine workplace coaching effectiveness: A systematic literature review. *European Journal of Work and Organizational Psychology*, *27*(3), 342–361. https://doi.org/10.1080/1359432X.2018.1446946

Brown, N. E., & Montoya, C. (2020). Intersectional mentorship: A model for empowerment and transformation. *Political Science & Politics*, *53*(4), 784–787. https://doi.org/10.1017/S1049096520000463

Brynjolfsson, E., Li, D., & Raymond, L. R. (2023). *Generative artificial intelligence at work*. National Bureau of Economic Research. http://www.nber.org/papers/w31161

Carnegie, M. (2022, August 3). *Gen Z: How young people are changing activism*. BBC Worklife. https://www.bbc.com/worklife/article/20220803-gen-z-how-young-people-are-changing-activism

Chew, H. E., & Chua, V. (2022, September 19). Singapore youth: In defence of "strawberries". *The Straits Times*. https://www.straitstimes.com/opinion/singapore-youth-in-defence-of-strawberries

Chua, D. (2019, July 31). Not a snowflake or strawberry: S'pore youth not that different from previous generations. *The Straits Times*. https://www.straitstimes.com/opinion/stop-labelling-youth-start-valuing-them

Dell'Acqua, F., McFowland III, E., Mollick, E., Lifshitz-Assaf, H., Kellogg, K., Rajendran, S., Krayer, L., Candelon, F., & Lakhani, K. (2023). *Navigating the jagged technological frontier: Field experimental evidence of the effects of AI on knowledge worker productivity and quality*. Harvard Business School Technology & Operations Management. http://dx.doi.org/10.2139/ssrn.4573321

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*(2), 256–273. https://doi.org/10.1037//0033-295x.95.2.256

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.

Freeman, L. (2023, April 17). Developing a growth mindset culture. *Forbes*. https://www.forbes.com/sites/forbesnonprofitcouncil/2023/04/17/developing-a-growth-mindset-culture/?sh=18c7723a5822

Grant, A. (2017). The third "generation" of workplace coaching: creating a culture of quality conversations. *Coaching: An International Journal of Theory, Research and Practice*, *10*(1), 37–53. https://doi.org/10.1080/17521882.2016.1266005

Griffiths, K. (2005). Personal coaching: A model for effective learning. *Journal of Learning Design*, *1*(2), 55–65. http://dx.doi.org/10.5204/jld.v1i2.17

Gross, C. (2023, June 6). A better approach to mentorship. *Harvard Business Review*. https://hbr.org/2023/06/a-better-approach-to-mentorship

Jones, R. J., Woods, S. A., & Guillaume, Y. R. F. (2016). The effectiveness of workplace coaching: A meta-analysis of learning and performance outcomes from coaching. *Journal of Occupational and Organizational Psychology*, *89*(2), 249–277. https://doi.org/10.1111/joop.12119

Lim, S. M. (2023). The effectiveness of coaching to support ICT workplace learners' transition between institutes of higher learning (IHLs) and workplace. *Workforce Development Applied Research Fund (WDARF).* Retrieved from https://www.ial.edu.sg/research/wdarf-grant-call/wdarf-grant-call-results/?page=2.

Lim, S. M., Shahdadpuri, R., & Pua, C. Y. (2022). Coaching as an educator: Critical elements in a faculty development program. *The Asia Pacific Scholar: Medical and Health Professions Education*, *8*(2), 70–75. https://doi.org/10.29060/TAPS.2023-8-2/SC2802

Lim, S. M., & Patel, N. S. (2024). Coaching in higher education: Creating impact. In S. M. Lim, N. S. Patel, & R. Shahdadpuri (Eds.), *Coaching students in higher education a solution-focused approach to retention, performance and wellbeing* (pp. 3-18): Routledge.

Lloyd, A. (2023, November 3). *Gen Z workers are already fed up with office culture—and millennials are responding*. Business Insider. https://www.businessinsider.com/gen-z-complaints-about-work-office-culture-millennials-respond-2023-11

Ministry of Health. (2023). *National population health survey 2022: Household interview and health examination*. Epidemiology & Disease Control Division and Policy, Research & Surveillance Group, Ministry of Health and Health Promotion Board, Singapore. https://www.moh.gov.sg/docs/librariesprovider5/resources-statistics/reports/nphs-2022-survey-report-(final).pdf

Mok, A. (2024, January 31). *Younger workers are actually using AI on the job less than Gen X and millennials*. Business Insider. https://www.businessinsider.com/genz-using-ai-at-work-less-than-genx-millennial-employees-study-2024-1#

NTUC Youth Taskforce. (2023). *The new gen worker*. Youth Taskforce and Young NTUC, National Trades Union Congress (NTUC). https://www.ntuc.org.sg/uportal/news/The-New-Gen-Worker-Youth-Taskforce-Report-YoungNTUC/

Siegel, B. (2023, June 23). Debunking myths about Gen Z workers and how employers can adapt. *Forbes*. https://www.forbes.com/sites/forbesbusinesscouncil/2023/06/23/debunking-myths-about-gen-z-workers-and-how-employers-can-adapt/?sh=5cf173796f53

Smith, E. A. (2001). The role of tacit and explicit knowledge in the workplace. *Journal of Knowledge Management*, *5*(4), 311–321. https://doi.org/10.1108/13673270110411733

Tao, W., Zhao, D., Yue, H., Horton, I., Tian, X., Xu, Z., & Sun, H.-J. (2022). The influence of growth mindset on the mental health and life events of college students. *Frontiers in Psychology*, *13*, Article 821206. https://doi.org/10.3389/fpsyg.2022.821206

How Close Collaboration With Unions During the COVID-19 Pandemic Helped the SIA Group to Save Jobs and Emerge Stronger

Hui Fong Cham and Vanessa Ng Wee Leng

Abstract

When airports around the world were brought to a standstill by the pandemic, Singapore Airlines (SIA) Group was faced with its biggest challenge—management of its almost 30,000-strong staff in trying times which called for resource cuts. Nevertheless, the SIA Group successfully surmounted these challenges and emerged as one of the most resilient airlines in the post-pandemic landscape. The collaboration between the SIA Group and unions was pivotal in skilfully navigating a balance between a compassionate approach towards its workers and strategic measures aimed at ensuring organisational survival. Through the collaboration, schemes rooted in the SMART Strategy model—comprising Job Support, Job Matching, Job Advocacy, and Job Re-creation and Training—were developed to safeguard the livelihoods and bolster resilience within the workforce. This paper offers valuable lessons for other organisations at risk of technological disruption or industry transitions, and as layoffs become more commonplace.

Introduction

At the height of the Coronavirus disease 2019 (COVID-19) pandemic, once buzzing airports around the world came to an uncanny standstill as flights were grounded and borders stayed closed. Airlines globally scrambled to respond to manage the crisis and handle the impact on their staff. This included the Singapore Airlines (SIA) Group, Singapore's proudest global brand.

Without a domestic market, the closure of global borders and international travel restrictions led to a sharp decline in flights and passenger numbers for both Singapore Airlines and Scoot. In March 2020, the SIA Group announced that it will cut passenger capacity by 97% and ground 185 out of 196 aircraft in response to the unprecedented impact of the pandemic on its business. In April 2020, when Singapore's lockdown began, the SIA Group recorded only 11,000 passengers, constituting less than 1% of the numbers carried just three months earlier. Without any passenger revenues, the Company's monthly cash burn was around $400 million with no viable means to offset operational costs (Kaur & Toh, 2020).

Faced with the challenge of managing its almost 30,000-strong staff, the Group engaged its unions—the Air-Transport Executive Staff Union (AESU), Singapore Airlines Staff Union (SIASU), SIA Engineering Company Engineers and Executives Union (SEEU), Air Line Pilot Association-Singapore (ALPA-S), Scoot Staff Union (STSU)—and the National Trades Union Congress (NTUC) right from the start. SIA's priority was to do all possible to support the livelihood, health, mental well-being, and safety of its staff.

With the support of tripartite collaboration among the government, employers, and unions, the SIA Group successfully managed its costs, reduced job cuts, and redeployed thousands of workers. This allowed it to emerge as one of the most resilient airlines post-pandemic. These positive outcomes were the result of the strong trust developed with its unions over the years through a collaborative partnership, one which fostered openness and transparency in engagements. This article offers valuable lessons for other organisations at risk of technological disruption or industry transitions, and as layoffs become more commonplace.

The SMART Strategy Model

The collaboration between the SIA Group and its unions in implementing swift and decisive measures while ensuring the wellbeing, health, and safety of its workers, paralleled NTUC's SMART Strategy model, which encompasses (1) Job Support, (2) Job Matching, (3) Job Advocacy, and (4) Job Re-creation and Training.

(1) Job Support

The SMART Strategy model aims to safeguard livelihoods by empowering organisations to maintain operations and retain workers, even during challenging economic conditions. In collaboration with NTUC and the Labour Movement, the SIA Group leveraged government support schemes such as the Job Support Scheme and absentee payroll, which offered wage subsidies to alleviate operational expenditure. The SIA Group also implemented staff measures such as pay cuts, voluntary no pay leave, and early retirement schemes, in collaboration with the unions, to save as many jobs as possible.

(2) Job Matching

The SIA Group facilitated Job Matching by waiving its exclusive service clause, allowing workers to supplement their incomes by taking on additional employment opportunities in other organisations. As a result, over 700 employees were successfully redeployed to a diverse range of companies including Challenger, UOB, IKEA, and FairPrice for short work stints.

The coordination and administration work involved was made possible by unions, NTUC's Employment and Employability Institute (NTUC's e2i), and the Public Service Division, which helped to identify employment opportunities for SIA Group staff. This allowed the SIA Group to

retain its talents, preserve expertise, and prevent the loss of skills for at-risk workers by assisting them to find suitable opportunities.

More notable is the SIA Group Ambassador Scheme, which enabled the redeployment of more than 2,000 cabin crew and pilots, as front-liners during the pandemic. This tapped on the crew members' skills in hospitality and safety training, which were transferrable and aligned with the requirements of the Care Ambassadors, Transport Ambassadors, Contact Tracing Ambassadors, Social Service Officers, and StayMasked Service Ambassadors roles. As a result, workers who were most impacted by the reduction in airline operations remained employed and secured additional income. Many SIA Group staff who were redeployed said that supporting the national fight against the pandemic was extremely meaningful. The skills that they had picked up were also transferrable to their work in the SIA Group.

The SIA Group management likewise believed that these work experiences helped to enhance the overall customer service workers provided post-pandemic, while keeping manpower costs down during a critical time (Yong, 2024).

(3) Job Advocacy

Job Advocacy is centred around advocating on behalf of workers for changes aimed at enhancing the progressiveness of their work and working environment. This typically involves calling for greater flexibility, especially for caregivers, more effective performance evaluations, and financial assistance in times of need.

The SIA Group supported the unions' proposal to engage entities such as the Housing and Development Board, major banks, and the Inland Revenue Authority of Singapore to secure concessions and deferment for mortgage loans and income tax payments on behalf of their workers. This compassionate approach greatly alleviated the financial pressures on their workforce, and fostered stronger trust between staff and management.

(4) Job Re-creation and Training

Finally, the SIA Group supported its unions' calls for Job Re-creation and Training to upgrade workers' skills while the airline industry prepared for the post-pandemic transformation. The main hurdle to job training and upskilling typically lies in securing mainstream funding. Since SkillsFuture Singapore funding is tied to specific frameworks, pedagogy, and curriculum, SIA's management found it challenging to leverage existing schemes.

NTUC appealed to the Civil Aviation Authority of Singapore on behalf of both the management and unions for assistance. The Singapore OneAviation Reskilling (SOAR) programme, a collaborative effort between the Civil Aviation Authority of Singapore and NTUC, was established to meet immediate on-ground needs. NTUC was entrusted with the oversight of resources under SOAR, co-funding the programme through the NTUC-Education and Training Fund (NETF), which further defrayed training costs and allowed for a more agile allocation of training funds. SOAR supported UPLIFT, SIA's upskilling and reskilling initiative, in its primary goal of equipping employees with the necessary skills to both overcome existing challenges and prepare workers for the future. This yielded impressive results with over 28,000 courses taken in total and an average of 13.6 training days per worker.

Although the multi-faceted job support schemes stemming from the SMART strategy proved beneficial, recruitment freezes, pay cuts, no-pay leave schemes, and retrenchments could not be completely avoided. The SIA management worked with unions to carefully design and implement these measures. The management also exemplified responsible leadership by being the first to undergo pay cuts ahead of staff.

Despite deferring a retrenchment exercise for as long as they could, as the pandemic persisted, the harsh reality was that retaining all cabin crew was not sustainable given that there were still no signs of recovery. It was also not tenable for the non-Singaporean crew to remain in Singapore and continue to pay rent when their income had been severely reduced.

This decision, whilst difficult, was a last resort for the SIA Group, and a pragmatic response to the circumstances that threatened its stability. Following NTUC's Fair Retrenchment Framework, affected staff received dignified exits, compensation in line with established guidelines, and support for their transition. SIA Group also maintained an open stance toward rehiring these individuals when the demand for air travel picked up again, demonstrating a forward-looking and compassionate approach to workforce management.

Conclusion

The SIA Group's close partnership with its unions is a case study in how tripartite collaboration can help organisations to skilfully manage a crisis, ensure organisational survival, and demonstrate decisive and compassionate leadership. Strong collaboration between management and unions played a crucial role in steering the SIA Group from distress to vitality within a short span of three years.

The close working relationship, trust, and solution-oriented mindsets enabled the management and unions to adopt multifaceted approaches to retaining SIA Group's workforce, fostering open communication, ensuring adherence to fair retrenchment practices, and exploring innovative solutions.

As the face of Singapore's aviation industry, the performance of the SIA Group is vital to the sector's overall success and the country's status as a global air hub. The collaboration with unions, balancing operational stability with a commitment to workforce well-being proved an important truth: when confronted with adversity, we are stronger together.

BIOGRAPHIES

Hui Fong Cham

Ms Cham Hui Fong serves as Deputy Secretary-General and Group Director, Workforce of the National Trades Union Congress (NTUC), Singapore, where she looks after the partnership and synergies amongst the six workforce segments in NTUC. Among other positions, she is the Executive Secretary of the SATS Workers' Union; serves as an advisor to the Air-Transport Executive Staff Union, SIA Engineering Company Engineers and Executives Union, and Singapore Airlines Staff Union; and is an Authority Member of the Civil Aviation Authority of Singapore. Representing the Labour Movement and all workers groups, Ms Cham sits in several tripartite committees that look into labour-related legislations, wages, workplace and employment practices including the employment of mature workers and workers in the aviation sector.

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Ms Vanessa Ng Wee Leng was appointed as SIA's Senior Vice President, Human Resources, in October 2017. Prior to joining SIA, Ms Ng was the HR Operating Partner at Temasek International Advisors. She provided Strategic HR support to new business platforms spearheaded by the Enterprise Development Group (EDG) at Temasek. Prior to Temasek, she was the Chief People Officer at Fortis Healthcare. In that role, she successfully completed the global start-up of Fortis Healthcare headquarter operations in 18 months. Prior to Fortis Healthcare, Ms Ng also held global HR leadership roles at Neptune Orient Lines Limited and General Electric (U.S).

REFERENCES

Kaur, K., & Toh, T. W. (2020, March 27). SIA aims to raise $15 billion with support from Temasek to combat Covid-19 fallout. *The Straits Times*. https://www.straitstimes.com/singapore/transport/sia-aims-to-raise-15-billion-amid-major-financial-challenges-posed-by-covid-19

Yong, L. X. (2024, January 15). SIA Group, MOH, PSD ink agreement to train and deploy airline staff during national crises. *The Straits Times*. https://www.straitstimes.com/singapore/sia-group-moh-psd-ink-agreement-to-train-and-deploy-airline-staff-for-national-crises

Practitioner Insights Into Supporting Women at Work Through Administering Flexible Work Arrangements

Wan Ling Yeo

Abstract

This practitioner note recognises Flexible Work Arrangements (FWAs) as instrumental in supporting workers with caregiving responsibilities, especially working women, in sustaining and developing their careers. Survey findings reveal that workers in full-time positions often find it necessary to take time off from work, but that this negatively impacts their performance, well-being, and career prospects. FWAs therefore benefit workers by helping them manage both caregiving and work responsibilities without the fear of facing unspoken penalties at work. Drawing on two successful case studies of companies committed to empowering women to reenter the workforce, this practitioner note shares key insights into the implementation process of FWAs, which includes job redesign, management support, and a shift towards outcome-based deliverables. These findings and strategies show that job redesign and support from top management are key factors for the successful implementation and maintenance of FWAs, which by extension supports women's and caregivers' equal participation and career advancement in the workforce.

Introduction

Thirty-five years ago, the term "the second shift" was coined by sociologist Arlie Hochschild (Hochschild & Machung, 1989) to describe the phenomenon where women return home after a full day of paid work to another round of unpaid housework and caregiving for children or older family members, following the influx of women and mothers joining the workforce and dual-income households becoming the norm. Thirty-five years later today, this term has not lost its relevance—despite women making up half of the labour force and earning more, they still shoulder nearly twice the amount of housework and childcare as men (National Population and Talent Division, 2021). In Singapore, women also make up close to 70% of all caregivers (National Council of Social Service, 2022). Women's dual responsibilities at work and in the home therefore result in them being more vulnerable to career interruptions and unspoken penalties at work than men. Just this year, a groundbreaking World Bank Group (2024) report found that no country in the world affords women equal opportunities as men in the workforce, with the global gender gap for women in the workplace being far wider than previously thought. Closing this gap is expected to increase global gross domestic product by more than 20%.

In the same report, Flexible Work Arrangements (FWAs) were identified as an indicator of workplace equality, with Singapore's Tripartite Guidelines on Flexible Work Arrangement Requests being recognised as one positive example of potential frameworks that support FWAs' implementation. In April 2024, the National Trades Union Congress (NTUC) went one step further to propose making FWAs official at the workplace for the first time, with the aim of making it easier for workers to request for them. While the option to request for FWAs benefits all stakeholders—workers, by helping to alleviate stress and burnout; employers, by supporting talent retention; and Singapore as a whole, by promoting work–life harmony, healthy family relationships and social lives, and growth in a shrinking workforce—FWAs are particularly significant for working women. There are currently about 260,000 women aged between 25 and 64 years old in Singapore who are not in the workforce and most of whom are stay-at-home mothers and/or caregivers for their family members. NTUC's year-long #EveryWorkerMatters Conversations, which engaged over 42,000 workers, found that women who wished to return to work after having left the workforce for a period of time due to caregiving responsibilities found it difficult to reenter because of challenges in juggling their dual responsibilities. FWAs are therefore a key consideration for working women and workers with caregiving responsibilities when deciding whether to stay in a job or return to the workplace.

This practitioner note therefore recognises FWAs as instrumental in supporting working women and workers with caregiving responsibilities in sustaining and developing their careers. Survey findings reveal that workers in full-time positions often find it necessary to take time off from work, but this negatively impacts their performance appraisals, well-being, and career prospects. FWAs benefit workers by helping them manage both caregiving and work responsibilities without the fear of facing unspoken penalties at work. Drawing on successful case studies of companies committed to empowering women to reenter the workforce, such as Chye Thiam Maintenance (CTM) and AsiaOne Online (AOO), this practitioner note shares key insights into the implementation process of FWAs, which includes job redesign, management support, and a shift towards outcome-based deliverables. As a tripartite partner, NTUC takes into account both employers' and employees' needs to build mutual understanding and trust, anticipate potential challenges to effective management and communication, while supporting workers from being unfairly penalised for requesting for or using FWAs. Thus, NTUC is committed to helping workers and companies navigate this process and stay vigilant in addressing potential challenges and inequalities.

the workforce, with female participation rising from 57.7% in 2012 to 63.4% in 2022 (Ministry of Manpower, 2022). While these are remarkable and encouraging signs of progress thanks to the good work of women leaders who have come before us, as aforementioned, the path to equality remains long ahead.

At NTUC, we recognise that supporting women at work requires a whole-of-society approach including men stepping up to share housework and caregiving responsibilities, employers' ability to provide paid caregiving/family leave, and more financial support and subsidies for needy families. NTUC has therefore been a key player in creating a nation-wide care ecosystem, comprising childcare and eldercare centres (My First Skool and NTUC Health). NTUC has strongly advocated for caregiving/family leave, pushing for this in our Collective Agreements as well as in the Parliament. Through our work with our nonprofit entity, the Centre for Domestic Employees, NTUC has also promoted healthy and productive relations between migrant domestic workers and their employers. The implementation and normalisation of FWAs represents the next step in our process of creating a sustainable care ecosystem for Singaporean workers.

The NTUC U Women and Family (U WAF) is an initiative that strives to support the aspirations and choices of working women, whether that means pursuing a career and financial adequacy, devoting more time and energy to caregiving, or both. The U WAF has advocated for FWAs since 1995, with the understanding that reproductive works like housework and caregiving are often a job in itself, but round the clock with no specified breaks, and traditionally disproportionately shouldered by women. At many of U WAF's engagements with stay-at-home women, we hear from the ground that they wish to return to the workforce, but face obstacles such as recruiters who perceive their gaps in employment as rendering their skillsets and experience irrelevant or outdated. They may also lack the confidence in making the adjustment to return to an ever-evolving workforce. The absence of FWAs then represents yet another obstacle in women and caregivers' transition back into the workforce. A 2023 survey conducted by U WAF and the People's Action Party Women's Wing found that a whopping 85% of 2,711 caregivers chose FWAs as their most preferred form of support, followed by 64% for paid caregiving leave, and 57% for financial support such as subsidies or medical insurance (Lim, 2024). This strong preference for FWAs is also reflected in an NTUC survey of 1,000 workers with caregiving responsibilities, who expressed that they often found it necessary to take time off from work, but suffered in their performance appraisals, well-being, and career prospects as a result.

The COVID-19 pandemic has proven that remote work, hybrid work models, flexible work hours, etc. are not only viable, but even necessary for companies to sustain operations during challenging and evolving times. Singapore is no exception. With our ageing workforce, shrinking labour supply, and growing caregiver needs, losing this significant group of skilled women who hope to return to the workforce exacerbates the labour crunch, leads to the loss of household income, and hampers the growth of our economy. Without a doubt, FWAs are here to stay and hold the potential to create new possibilities for a more agile and inclusive workforce in the pursuit of a well-balanced and meaningful life. In fact, Singaporean companies seem to have already recognised this potential, with 78% offering at least one type of formalised FWA in 2020, up from 53% pre-pandemic. However, while there is capacity for all jobs to be made more flexible through new and innovative work redesign processes and technologies, companies may not have the right resources and practices in place to implement FWAs fairly and sustainably. For example, a key concern is how FWAs may affect the work appraisal process. The following two case studies therefore serve as an informational resource on the tried-and-tested operational playbooks of implementing and maintaining FWAs from real-world stakeholders that have made considerable progress with FWAs within their organisations. These findings and strategies, based on surveys, interviews, and focus group discussions conducted in 2021 and 2023, respectively, show that job redesign and support from top management are key factors for the successful implementation and maintenance of FWAs, which by extension supports women's and caregivers' equal participation and career advancement in the workforce.

Case Study A: C U Back at Work! Programme With Chye Thiam Maintenance

Based on the aforementioned feedback from engagements and surveys with women who hoped to return to the workforce, working women and caregivers, as well as employers, U WAF launched a pilot programme to support women to transition back to the workplace. Codeveloped with employers and supported by Workforce Singapore (an agency under the Singapore Ministry of Manpower), the C U Back at Work! (CUB) programme was designed by the U WAF to boost participants' confidence, skillsets, and career prospects and income. Through this programme, CUB employers could also enjoy financial support and grants from NTUC to embark on the job redesigning process to implement FWAs (Yeo, 2023).

One pilot that aimed to offer 500 roles to returners was launched with Chye Thiam Maintenance (CTM), a company unionised under the Building Construction And Timber Industries Employees' Union, in April 2023. CTM is one of Singapore's highest-ranked environmental services companies with a nearly 3,000-strong staff, of which an estimated 70% are female. This programme is a first-of-its-kind in the environmental industry and stands out with its innovatively redesigned jobs uncommon in operations-focussed industry. Together with CTM, CUB offers returners a 6-week career trial comprising curated training modules and on-the-job training. Returners will receive a $30 skills incentive for completing each technical training module in their salaries. They will also receive a retention bonus and a one-off $100 incentive for each completed module.

Successful Job Redesign Requires Understanding Workers' Needs

CTM embarked on the process of job redesign first by creating a module on confidence building to be included in their training programme, which offered flexible training hours. Participants who were selected underwent a paid career trial before they were deployed, comprising seven training modules including skills and confidence courses, and on-the-job training to ease their transition back to the workforce.

Once training was completed, participants were deployed to various worksites across Singapore. The flexibly redesigned role allowed participants to choose their work hours in blocks of 3–4 hrs, which allowed them to balance work and caregiving commitments, and at various locations across Singapore. Participants could also opt for part-time or full-time work. To facilitate scheduling needs, CTM embarked on a Company Training Committee with NTUC, comprising workers, senior management and unions to map out workers' skills upgrading needs and create an app for workers to schedule their work slots.

To retain talent, CTM also created an improved bonus structure and career roadmap. Participants could look forward to retention bonuses at the 3-month and 6-month marks, on top of other financial incentives. After completing the training, the workers were placed on a career roadmap that enabled them to progress towards specialised and supervisory roles with FWAs.

Gender-Informed Management Support and Changes to Organisational Culture

After a successful start, with high levels of interest from the ground, CTM observed that there was a higher-than-normal drop-out rate after participants have registered their interest. This was attributed to the poor confidence women returners had of their own capabilities as well as the trust they had in their employer.

Edy Tan, chief executive officer of CTM, said:

> We understand that some returners have been out of the workforce for many years. As such, they might not understand current work environments and cultures, some might even have lost their confidence. Our management and Human Resource (HR) need to build up their confidence again, and to acclimatise our participants slowly back into the work environment.

With support from leadership, U WAF and CTM continually looked into ways to refine the hiring process by refining workstreams such as the process by which HR contacted and

integrated the women returners. CTM HR redesigned these processes to make them less intimidating for women who lacked confidence, e.g., having informal telephone chats in lieu of a formal email correspondence or a job interview. CTM also redesigned training courses with flexible hours and customised content, to enable women returners to adapt steadily and comfortably back into the workforce, e.g., including a session to introduce them to their teammates during training, which also offered flexible schedules.

A less hierarchical reporting and approval structure for leave enabled CTM to structure its FWAs to respond more nimbly to sudden changes among its workforce, such as illness or familial issues. One participant expressed her gratitude to the newly designed FWA that allowed her to stay working while being able to accompany her husband for his cancer treatments. These comprehensive measures, from training to hiring and deployment, resulted in a programme that effectively and smoothly reintegrated women into the workforce with minimal disruption to the organisation's existing workstreams.

The Transition to Outcome-Based Contracts in the Service Industry

One key discovery by CUB through this pilot is the current industry norm in Singapore for outsourced service contracts, which is based on head count and man-hours, rather than outcomes. As FWAs become more prevalent in the service industry, and more workers take on flexi-workloads, flexi-hours, and flexi-locations, the standard for how companies are assessed and engaged should be based on outcomes. This means that both companies and their clients must embrace FWAs. Contracts that reflect this new standard remain rare. Employers in the service industry shared that while they were in full support of FWAs due to the manpower crunch, when their clients insisted on full-time, on-site workers in their service contracts, their hands were tied. This invisible obstacle was then reflected in engagement sessions held with employers in October 2023, organised by the Tripartite Workgroup for Flexible Work Arrangements.

Case Study B: Yes! To Flex at AsiaOne Online

CUB's second pilot was launched with AsiaOne Online (AOO), a privately held digital media platform that was established 28 years ago, unionised under the Creative Media and Publishing Union. As of December 2022, they boasted a monthly audience base of over 5 million users with 25 million page views. In 2021, during the pandemic, AOO's leadership developed and instituted FWAs policies in consultation with their staff as part of their business continuity efforts. After the pandemic lifted, AOO strove to continue the practice, despite facing challenges (Tan, 2024).

Building Trust Comes From the Top

Some of the difficulties AOO faced in implementing FWAs came from their management and supervisory teams, which were more accustomed to pre-pandemic working arrangements. While the organisation pivoted to FWAs measures as part of their business continuity efforts during COVID-19, after the pandemic lifted, attitudes and perceptions returned to previously established norms. Sean Ler, chief executive officer at AOO, saw the need to build trust between management and employees if they wanted to extend the practices from COVID-19 into the present as a new norm.

As a start, Sean shared with AOO workers his reasons for embarking on a new direction of adopting FWAs as a new norm and clearly articulated the outcomes and deliverables that are required from the teams. He reaffirmed that workers are encouraged to take the FWAs and should trust management that they will not suffer unspoken penalties for choosing to do so. Likewise, management should trust workers that they will meet their KPIs even on FWAs. With proper company-wide goal-setting exercises, workers were able to strive towards maintaining work performance and productivity standards while enjoying greater trust and flexibility.

Transparency and Clarity Empower FWAs Adoption

AOO was motivated to develop a progressive FWAs policy to promote the welfare and needs of workers who were going through different phases in life. This policy framework was developed after obtaining feedback from workers and consulting the Tripartite Standard on FWAs. AOO's workers were granted 6 FWA days (flexi-location) every calendar month. Special considerations were given to caregivers and parents, granting them more FWA days, up to a maximum of 12 days per month. Other arrangements include flexi-time, where staff have the flexibility to augment their work hours, and flexi-workload, where staff can opt for shorter hours or part-time work.

Sean explained:

> All our businesses are unique and different. I think you can only look at the practices and ask ourselves, what am I prepared to change for my business? What am I prepared to change based on the employees that I have? The FWAs customisation is quite important because every worker matters, but every worker is different. And only you as an employer will know what kind of employees you have, how they're different, their stories, their background.

To empower workers to utilise AOO's new FWAs policy, AOO redesigned their HR system to enable online FWAs application and approval. The system also transparently and clearly reflected the number of FWAs days each employee is entitled to per month. The system was then integrated with teams' calendars to enable easier visibility for resource management and better planning. This also helped to reinforce the trust that the teams have in one another and to deliver on their KPIs. Finally, AOO also formed a Company Training Committee with NTUC, working closely with the Creative Media and Publishing Union to upskill its workforce, enhance productivity, and explore job redesign opportunities.

Effective Retention, Greater Productivity

AOO found great success with FWAs. AOO workers showed that they were responsible, highly motivated, did not abuse the system, and could be trusted to deliver good work while on FWAs. Over 60% of employees utilised their basic FWAs privileges and AOO saw an improvement in overall business performance, including improved retention by 50% and greater operational productivity due to time saved from commuting. In fact, AOO found that implementing FWAs led to staff being more engaged and productive, which in turn led to longer readership duration on AOO articles when compared to other online news portals. One female AOO staff employee, who acted as caregiver to her child and elderly parents, expressed that the implementation of FWAs allowed her to stay on at work while tending to the needs of her loved ones.

Conclusion

At NTUC, we believe that the successful implementation of FWAs is not only instrumental in enabling women and caregivers to stay in the workforce, but a pivotal strategy for businesses to retain talent within a competitive labour market and improve work productivity and engagement. The above two case studies have demonstrated that FWAs not only support women and caregivers, but also improve work–life harmony for all workers. Many employers and senior management personnel tend to express concern that workers on FWAs will be less productive, less efficient, and less motivated to work. Our case studies in Singapore have shown it to be otherwise. Employers and senior management who display more trust in their workers create better work outcomes and are able to build a work culture that promotes sustainability, flexibility, and mutual trust. As one of the most overworked and sleep-deprived countries in the world, and with more Singaporeans calling for work–life harmony and healthy family relationships and social lives, we believe that employers who stay ahead of the curve in rethinking and reshaping how, where, and when we work will stand to benefit in the long run. NTUC will continue to champion for FWAs as a key pillar of support for our Singaporean workers, and will continue to work with tripartite partners to create win–win outcomes for all.

BIOGRAPHY

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Ms Yeo Wan Ling holds the position of Assistant Secretary-General and is concurrently the Director of the U SME and U Women & Family Units. She is also Advisor to the National Taxi Association, National Private Hire Vehicles Association and National Delivery Champions Association. Representing workers and the Labour Movement, Ms Yeo is the Co-Chairperson of the Tripartite Workgroup on Flexible Work Arrangements (TWG-FWA), formed to develop the Tripartite Guidelines on Flexible Work Arrangement Requests (TG-FWAR).

REFERENCES

Hochschild, A. R. & Machung, A. (1989). *The second shift: Working parents and the revolution at home*. Viking, New York.

Lim, M. (2024, February 23). *NTUC survey: 85% of working caregivers in S'pore think flexible work arrangements will help them the most*. Mothership. https://mothership.sg/2024/02/ntuc-survey-working-caregivers-singapore/

Ministry of Manpower. (2022). *Labour force in Singapore 2022.* https://stats.mom.gov.sg/iMAS_PdfLibrary/mrsd_2022LabourForce_survey_findings.pdf

National Council of Social Service. (2022). *Quality of life of caregivers study.* https://www.ncss.gov.sg/press-room/publications/UnderstandingtheQualityofLifeofCaregivers

National Population and Talent Division (2021). *2021 marriage and parenthood survey*. Strategy Group, Prime Minister's Office. https://www.strategygroup.gov.sg/media-centre/press-releases/marriage-and-parenthood-survey-2021/

National Trades Union Congress. (2022). *Our workers' compact.* https://www.ntuc.org.sg/Uportal/News/Flipbooks/EWMC_OurWorkersCompact

Ng, M., & Ong, J. (2021, September 19). Women who take on caregiving duties need better financial and emotional support: PM Lee. *The Straits Times*. https://www.straitstimes.com/singapore/women-who-take-on-caregiving-duties-need-better-financial-and-emotional-support-pm-lee

Tan, C. (2024, January 31). *Flexible work arrangements to be normalised in upcoming guidelines: Gan Siow Huang*. AsiaOne. https://www.asiaone.com/singapore/guidelines-are-meant-normalise-process-requesting-flexible-work-arrangements-gan-siow-huang

World Bank Group (2024). *Women, business, and the law 2024*. https://doi.org/10.1596/978-1-4648-2063-2

Yeo, N. (2023). *NTUC U Women and Family joins forces with cleaning firm to pioneer first-of-a-kind programme for women returners*. Union of Telecoms Employees of Singapore. https://uatportal.ntuc.org.sg/utes/news/NTUC-U-WAF-joins-forces-with-cleaning-firm-to-pioneer-first-of-a-kind-programme-for-women-returners/

Analysis of Retrenchment Trends in Singapore

Shawn Seah and Valerie Tan

Abstract

Between 2008 and 2023, there had been a fairly stable level of retrenchment of an average of 7.0 retrenched resident employees per 1,000 resident employees in Singapore. During times of crisis or rough economic conditions, the incidence rate rose, as seen in 2008–2009 during the Global Financial Crisis and 2020 during the onset of the Coronavirus disease 2019 (COVID-19) pandemic with higher rates of 13.8 and 11.1 retrenched resident employees per 1,000 resident employees, respectively. Delving deeper into retrenchment figures in 2023, an upward trend was observed from a low of 3.4 per 1,000 resident employees in 2022, suggesting stronger economic headwinds and indicating softening labour market conditions. Examining retrenched employees who partnered with the National Trades Union Congress' Employment and Employability Institute (NTUC's e2i), we found retrenched employees took longer to be placed in 2023 compared to 2022. However, the situation was not entirely bleak as the proportion of placed retrenched employees with similar or better pay remained largely the same in 2022 and 2023. Evidence suggests that retrenched employees who take the first job that comes along and employees who lack relevant skills and as a result take more than 5 months to find their next job tend to receive lower wages. As such, the Singapore government's suggested transition support scheme is timely, especially when taken in the context of other efforts by the Labour Movement, including engaging companies to transform to reduce eventual retrenchment numbers and strengthening the NTUC's e2i's career coaching capabilities to help employees better chart their career pathways.

Introduction and Methodology

Retrenchment involves reducing the number of employees due to various reasons, including economic constraints, technological changes resulting in structural unemployment, or shifts in market demand. In Singapore, employers with at least 10 employees and who are retrenching must notify the Ministry of Manpower. This paper analyses and delves deeper into historical retrenchment trends in Singapore.

To develop this paper, the Planning, Strategy and Data Analysis team of the National Trades Union Congress' Employment and Employability Institute (NTUC's e2i) looked at the e2i's internal retrenchment data, retrenchment statistics from the Ministry of Manpower, as well as placement data from Workforce Singapore (WSG) to unravel trends and obtain insights. The Job Seeker Group (JSG) and Industry Partnership Group (IPG) at the e2i were consulted to contextualise and validate the insights.

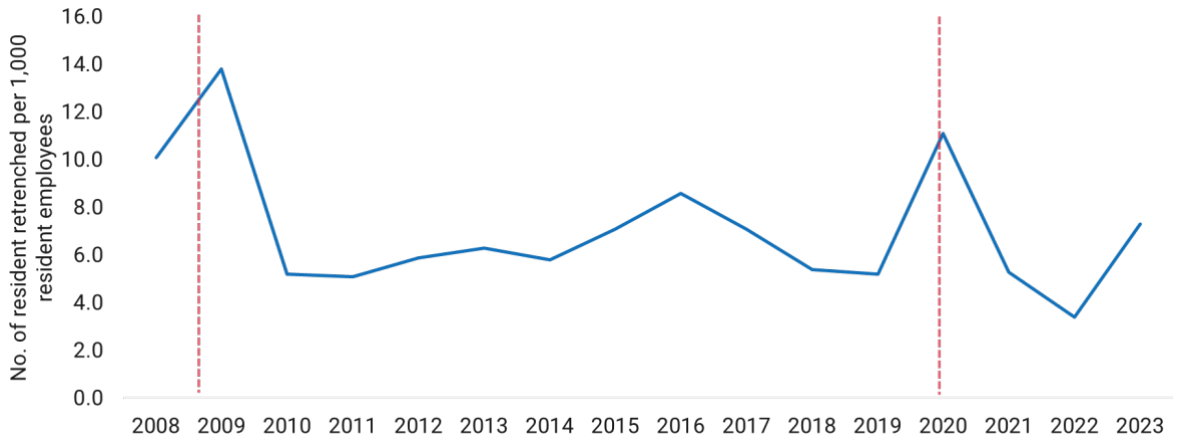
The next few sections delve deeper into our key observations that, between 2008 and 2023, there had been a fairly stable level of retrenchment of an average of 7.0 retrenched employees per 1,000 resident employees. During times of crisis or rough economic conditions, the incidence rate has risen, as was seen in 2008–2009 during the Global Financial Crisis and 2020 during the onset of the Coronavirus disease 2019 (COVID-19) pandemic. Delving deeper into 2023's retrenchment figures, an upward trend was observed from a low of around 3.4 per 1,000 resident employees in 2022, suggesting stronger economic headwinds and indicating softening labour market conditions. We found that retrenched employees who partnered with NTUC's e2i took longer to be placed in 2023 compared to 2022. However, the situation was not entirely bleak as the proportion of placed retrenched employees with similar or better pay remained largely the same in 2022 and 2023. In addition, employees who take the first job that comes along and employees who lack relevant skills and take more than 5 months to find their next job tend to receive lower wages. As such, the Singapore government's suggested transition support scheme that provides generous financial support for retrenched employees to retrain and reskill is timely, especially when taken in the context of other efforts by the Labour Movement, including engaging companies to transform to reduce eventual retrenchment numbers; strengthening the human capital capabilities of companies to cushion downstream retrenchment impact; and strengthening NTUC's e2i's career coaching capabilities to help employees better chart their career pathways.

Review of Retrenchment Trends in Singapore

Overview

Figure 1

Incidence of Resident Retrenchment



Source: Labour Market Survey, Manpower Research and Statistics Department, Ministry of Manpower

Broadly, the incidence rate in Singapore remained roughly steady at an average of 7.0 retrenched resident employees per 1,000 resident employees. Generally, this means that there is a relatively stable level of resident employees retrenched each year, but incidents increase during crises or rough economic conditions. According to Figure 1, the COVID-19 pandemic in 2020 triggered another global economic crisis (World Bank Group, 2022) and caused the incidence rate to rise to 11.1 (in 2020), although admittedly this figure was lower than 2008–2009, which had a high incidence rate due to the Global Financial Crisis.

From April 1, 2022, Singapore reopened its borders. Increased consumer demand coupled with the outflow of foreign employees during the pandemic resulted in a tight labour market. From 2020 to 2022, the Singapore government had provided support measures such as the Job Support Scheme that provided wage support to employers to retain resident employees (Inland Revenue Authority of Singapore, 2023). Such support measures were rolled back in 2023. With the tight labour market, retrenchment incidence fell to an all-time low of 3.4 retrenched resident employees per 1,000 resident employees in 2022. However, this period was short-lived as supply shortages were exacerbated by the Russian invasion of Ukraine which disrupted supply chains and caused higher food and gasoline prices worldwide that persisted into 2023. To mitigate inflation, the US Federal Reserve increased interest rates from March 2022, with further increases in 2023 that spurred central banks worldwide to follow suit. As such, the incidence rate crept up to about 7.3 retrenched resident employees per 1,000 resident employees, with the trend suggesting that the already rough economic conditions could become more challenging (despite expectations of more retrenchments in 2024, historical data suggest that the retrenchment incidence rate will remain lower than levels seen during COVID-19 and Global Financial Crisis).

Overview of Placement of Retrenched Employees Who Partnered NTUC's e2i/WSG

We turn our attention to retrenched employees who partnered NTUC's e2i/WSG. The methodology of this section is based on retrenchment data according to the Mandatory Retrenchment Notifications that were assigned to NTUC's e2i/WSG and matched placements in NTUC's e2i's/WSG's databases in 2022 and 2023. Approximately 60% retrenched employees who were assisted by NTUC's e2i/ WSG for 2023 found a new job within six months, compared to around 70% for 2022[1].

However, the situation was not entirely bleak. Turning our attention to wage outcomes, the proportion of placed retrenched employees with similar or better pay was comparable, with 41% in 2022 and 40% in 2023 (Figure 2)[2].

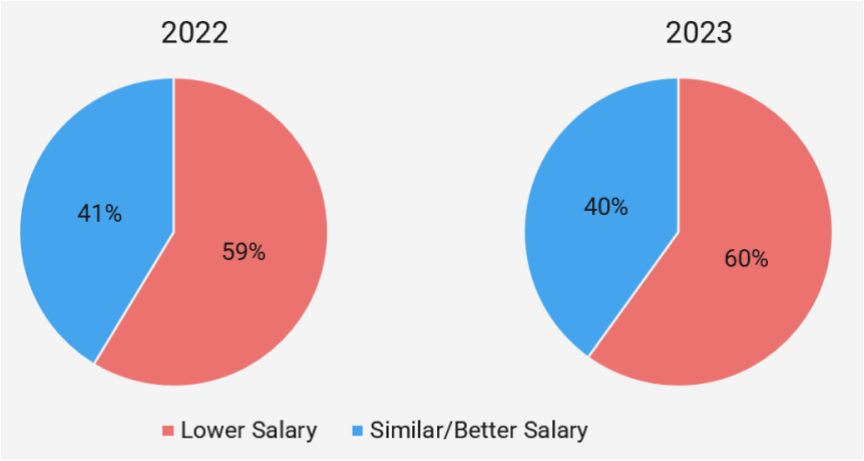
NTUC's e2i's internal data also showed that median salary was the highest for employees who took between 3 months and 4 months to secure employment after being retrenched as compared to the employees who took the first job offer that came along. As such, active job search should require a longer time to find a best fit and/or allow time for upgrading, affecting particularly retrenched employees who may live hand-to-mouth. This group of employees is likely to face a poorer placement outcome, for instance a lower salary, as they feel the pressure to rush into the first available job that they can find. As for employees who lack relevant skills, they would take longer than 5 months to find a job, with a wage lower than what they had received previously.

[1] Manpower Research and Statistics Department, Ministry of Manpower's data on re-entry rates refers to retrenched residents while data here refers to retrenched employees being placed by e2i.

[2] Planning, Strategy, and Data Analysis team conducted a linear regression to correlate wages with Singapore Standard Occupation Classification (SSOC) codes and found that all independent variables were statistically significant, except AP/T wages.

Figure 2

Salaries Remain Comparable for Jobseekers Who Partner the National Trades Union Congress' Employment and Employability Institute (NTUC's e2i)



Source: NTUC's e2i's internal data

Insights and Interventions

From the analysis above, the transition support scheme to support involuntary unemployed employees that was announced in the Singapore government's 2024 Budget Statement is timely as it will likely have significant beneficial effects on retrenched employees (Ministry of Finance, 2024). The transition support scheme provides unemployment financial support for low-wage employees and low-income households to tide them over the period of unemployment. Furthermore, the transition support scheme also alleviates the pressure on retrenched employees to accept the first job that comes along and affords them some time to undergo training and upskilling, to gain relatively more relevant skills that hiring companies are looking for.[3] Then-Deputy Prime Minister Mr. Lawrence Wong announced on 16 February 2024 during the Budget Statement that those who have been laid off will naturally feel the pressure to rush into the first available job they can find, but this job may not always be a good fit. As such, these employees should ideally consider ways to upgrade their skills and find a job that fits their aptitude and talent (Tang, 2024). This continues with the overall direction of the Singapore government's ForwardSG announcements in 2022 to support involuntary unemployed employees (Goh, 2023). ForwardSG is a collective effort led by then-Deputy Prime Minister Wong and his leadership team, in public engagement exercises partnering with Singaporeans to review and refresh Singapore's social compact to set out a roadmap for the future (Ministry of Finance, 2022). To address employees' skills gap in securing job placements, Budget 2024 also provides a $4,000 enhanced SkillsFuture Credit for those aged 40 and above to support mature, mid-career Singaporeans to pursue another subsidised full-time Diploma and SkillsFuture Mid-Career Training Allowance to plug employees' skills gap (Shafeeq, 2024; SkillsFuture Singapore, 2024). This is part of the SkillsFuture movement, a national movement to provide Singaporeans with opportunities to develop their potential throughout life through training and upskilling (SkillsFuture Singapore, 2023).

The Singapore government's transition support scheme should also be situated within the broader context of the Labour Movement's efforts, including engaging companies on transformation and strengthening NTUC's e2i's career coaching capabilities to help employees better chart their career pathways. First, companies can access the NTUC Company Training Committee Grant to upskill, reskill, or redeploy their employees (for example through career conversion) through NTUC's e2i for their business transformation needs. Through these

[3] Worldwide, different countries have different support schemes for involuntary unemployment and are not directly or simply comparable to Singapore's proposed scheme. As a reference, the UK provides for both voluntary and involuntary unemployment, where if eligible, the 4 schemes are: New Style Jobseeker's Allowance (JSA); New Style Employment and Support Allowance (ESA); Universal Credit and Pension Credit.

transformation efforts, retrenchments would be minimised upstream. Second, NTUC's e2i also constantly explores innovative ways to augment our career coaches. This includes leveraging technology and jobs databases to enhance resources of our career coaches and to match jobs in accordance with recommended roles best suited to each individual jobseeker's needs, preferences, and skills, and to recommend relevant training for jobseekers to close any skills gaps. Innovation and technology will strengthen NTUC's e2i's longer-term career coaching capabilities to help employees better chart their career pathways.

Conclusion

This paper surveyed the retrenchment landscape in Singapore to identify key trends, analyse the data, and develop insights. Between 2008 and 2023, we found that there was a fairly stable level of retrenchment in Singapore, and higher incidence rates during crises or rough economic conditions, e.g., 13.8 retrenched resident employees per 1,000 resident employees during the period of the Global Financial Crisis and 11.1 during the start of the COVID-19 pandemic. In 2023, an upward trend was observed from a low of 3.4 in 2022, brought about by economic headwinds. Softening in labour market conditions from 2023 resulted in longer times for retrenched employees who partnered with NTUC's e2i to be placed. However, the situation was not all bleak, as the proportion of placed retrenched employees with similar or better pay was largely the same in 2022 and 2023.

Considering our findings as a whole, the Singapore government's proposed transition support scheme that will benefit involuntary unemployed employees is timely and relevant, especially when taken in the broader context of other efforts by the Labour Movement, including NTUC's e2i engaging companies to transform to reduce eventual retrenchment numbers and efforts that are underway to better use innovation and technology to strengthen NTUC's e2i's career coaching capabilities to help employees better chart their career pathways. Through close tripartite collaboration and partnership, the Singapore government, the Labour Movement, and employers, working together can support our employees as they transit towards better jobs for better lives.

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BIOGRAPHIES

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Shawn Seah is the Deputy Director overseeing the Planning, Strategy, and Data Analysis team at NTUC's Employment and Employability Institute. His past work experiences include corporate and strategic planning, policy formulation, and communications and engagement, with stints in the Ministry of Manpower, the Ministry of Defence, and the Ministry of Education.

Valerie Tan

Valerie Tan is a Senior Specialist at NTUC's Employment and Employability Institute in the Planning, Strategy, and Data Analysis team. Her background in Data Analysis and Economics enables her to navigate complex data while understanding the broader economic context of the employment facilitation landscape.

REFERENCES

Goh, Y. H. (2023, December 27). Forward SG report unveils social support plans, lays out mindset shifts needed amid changing times. *The Straits Times*. https://www.straitstimes.com/singapore/forward-sg-report-unveils-social-support-plans-lays-out-mindset-shifts-needed-amid-changing-times

Inland Revenue Authority of Singapore. (2023). *Jobs Support Scheme (JSS)*. https://www.iras.gov.sg/schemes/disbursement-schemes/jobs-support-scheme-(jss)

Ministry of Finance. (2022*). Launch of Forward Singapore: Partnering Singaporeans to refresh our social compact*. https://www.mof.gov.sg/news-publications/press-releases/launch-of-forward-singapore-partnering-singaporeans-to-refresh-our-social-compact

Ministry of Finance. (2024). *D. Equipping our workers for life.* https://www.mof.gov.sg/singaporebudget/budget-2024/budget-statement/d-equipping-our-workers-for-life

Shafeeq, S. (2024, February 19). Budget 2024: $4k SkillsFuture credit top-up for mid-career workers, subsidies for another diploma. *The Straits Times*. https://www.straitstimes.com/singapore/budget-2024-4000-skillsfuture-credit-top-up-further-subsidies-for-diploma-courses

SkillsFuture Singapore. (2023). *About SkillsFuture*. https://www.skillsfuture.gov.sg/aboutskillsfuture

SkillsFuture Singapore. (2024). *Empowering individuals to take ownership of your skills development and learning journey*. https://www.skillsfuture.gov.sg/initiatives/mid-career/credit

Tang, L. (2024, February 16). *Budget 2024: New financial support scheme in the works for retrenched workers*. Channel News Asia. https://www.channelnewsasia.com/singapore/budget-2024-financial-support-unemployment-benefits-scheme-retrenched-workers-4128606

World Bank Group. (2022). *World development report 2022: Finance for an equitable recovery.* https://openknowledge.worldbank.org/server/api/core/bitstreams/e1e22749-80c3-50ea-b7e1-8bc332d0c2ff/content

ADVISORY BOARD MEMBERS

Mr Ng Chee Meng
Secretary-General
National Trades Union Congress, Singapore
Chairman of the Advisory Board

Mr Ng Chee Meng was elected as the Secretary-General of the National Trades Union Congress (NTUC) on 22 May 2018. As the NTUC Secretary-General, Mr Ng advocates and pushes for initiatives that will lead to better wages, welfare and work prospects for workers. He championed the formation of Company Training Committees whereby unions and management work together to identify disrupted jobs and new roles, and curate training for workers to keep up with industry transformation.

Mr Ng drove the setting up of the NTUC Job Security Council to provide preemptive assistance for at-risk workers through training and job matching. Taking one step further to ensure that workers' concerns are heard, he launched the #EveryWorkerMattersConversation in 2022, where over 42,000 workers were engaged. Mr Ng was formerly the Minister in Prime Minister's Office and before that, was the Minister for Education (Schools) and Second Minister for Transport. Prior to his Cabinet appointment, Mr Ng was the Chief of Defence Force for Singapore.

Mr Patrick Tay
Assistant Secretary-General
National Trades Union Congress, Singapore

Mr Patrick Tay is the Assistant Secretary-General of the National Trades Union Congress (NTUC) and Member of Parliament of Pioneer Single Member Constituency (SMC). He is also the Director of NTUC Strategy, as well as Legal Services. He currently chairs the Government Parliamentary Committee for Education and the Financial Sector Tripartite Committee with the Monetary Authority of Singapore. He also co-chaired the PME Taskforce with the Singapore National Employers Federation in 2021. Besides that, he is the Executive Secretary for United Workers of Electronics & Electrical Industries (UWEEI) and is also Deputy Chairperson, REACH Supervisory Panel and Chairman, West Coast Town Council.

Representing workers and the Labour Movement, Mr Patrick Tay is the Supervising Lead for the Labour Movement's Financial and Professional Services Cluster. He reviews/updates employment and industrial relations legislation and has been pivotal in lobbying for the many changes to manpower related laws and policies in Singapore. He also sits on several government boards, national institutions, and tripartite committees.

Professor Tan Eng Chye
President
National University of Singapore, Singapore

Professor Tan Eng Chye was appointed President of the National University of Singapore (NUS) on 1 January 2018. He is the University's 5th president, and the 23rd leader to head Singapore's oldest higher education institution.

Professor Tan is a passionate and award-winning educator. He was a pioneer architect of the current academic system in NUS, and has seeded many initiatives such as the Special Programme in Science, University Scholars Programme, University Town Residential College Programme, Grade-free Year, and Technology-enhanced Education. He was recognised with the University Teaching Award for Innovative Teaching in 1998, and other teaching awards.

Professor Hoon Hian Teck
Professor of Economics
Singapore Management University, Singapore

Professor Hoon Hian Teck is Professor of Economics at the Singapore Management University. He specialises in macroeconomics, international trade, and economic growth. How Singapore managed to grow without being caught in the middle-income trap and understanding what is needed to generate economic prosperity as a mature economy has occupied his mind in recent years. He is author of *Economic Dynamism, Openness, and Inclusion: How Singapore Can Make the Transition from an Era of Catch-up Growth to Life in a Mature Economy* (2019). He is a past Vice-President of the Economic Society of Singapore (2002–2004) and co-editor of *Singapore Economic Review* (2002–2020).

Mr Alexander C. Melchers
Vice-President
Singapore National Employers Federation, Singapore

Mr Alexander Melchers is Vice-President of Singapore National Employers Federation (SNEF) and Member of the Advisory Council of the Singaporean-German Chamber of Industry and Commerce (SGC). Other current Tripartite appointments: NWC since 2006; Director in Institute for Human Resource Professionals (IHRP); past appointments: Chairman of the Tripartite Implementation Workgroups on Employability of Older Workers (Retirement and Re-employment); Board Member of Tripartite Alliance for Fair and Progressive Employment Practices (TAFEP).

After vocational training in international trade, he worked in Venezuela before studying at the University of St. Gallen. He worked in brand management with P&G; joined C. Melchers Group of Companies in Singapore in 1997. C. Melchers is a diversified trading, development and services company established in 1806. Headquarter in Bremen, Germany and offices across Asia. Married with four children.

Dr Beh Swan Gin
Permanent Secretary (Development)
Ministry of Trade & Industry, Singapore

Dr Beh Swan Gin was appointed as the Permanent Secretary (Development) at the Ministry of Trade & Industry on 1 May 2023. He was Chairman of the Singapore Economic Development Board (EDB) from December 2014 to April 2023. Prior to joining EDB, he was Permanent Secretary of the Ministry of Law from July 2012 to November 2014 and was Managing Director of the EDB from August 2008 to June 2012. He is a board director for Singapore Exchange Limited and chairs the board of CapitaLand Ascendas REIT Management Ltd.

Dr Beh is a medical doctor by training and graduated from the National University of Singapore. He is also a Sloan Fellow with a Master of Science in Management from Stanford University's Graduate School of Business and completed the Advanced Management Programme at the Harvard Business School.

EDITORIAL BOARD MEMBERS

Professor Chew Soon Beng
Senior Associate of Centre for Arts and Social Sciences
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Dr Chew Soon Beng is a Senior Associate at the Centre for Arts and Social Sciences at Nanyang Technological University (NTU). He is also an adjunct senior fellow at RSIS at NTU. Dr Chew has been Programme Professor at School of Public Affairs at China's University of Science and Technology since 2012. He had been a full professor of Economics at NTU from 1999 to 2018. He received his PhD from the University of Western Ontario, Canada. Current research includes Union Social Responsibility and Strategic Collective Bargaining. He is one of three editors of a book entitled *Political, Economic and Social Dimensions of Markets: A Global Insight*, published by World Scientific in 2022.

Dr Gog Soon Joo
Chief Skills Officer
SkillsFuture Singapore, Singapore

Dr Gog Soon Joo is the Chief Skills Officer at SkillsFuture Singapore, a statutory board under the Ministry of Education. She oversees the skills development system in Singapore, through working with tripartite partners in the identification, dissemination and measurement of the skills needs of Singapore economy. She works with global researchers, EdTech, HRTech and CareerTech partners in shaping the skills ecosystem. Her research interests include capitalism in the digital economy, new economy firms, skills ecosystems and skills policies. She has published on topics related to inclusive skills ecosystem, empowerment of adult learners, skills-use and job-design. She chairs the Singapore National Steering Committee for the OECD-PIAAC study, and she is a member of the International Committee of Experts for UNESCO Global Network of Learning Cities.

Associate Professor Ho Kong Weng
Associate Professor of School of Economics
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Associate Professor Ho Kong Weng is Associate Professor of Economics at the Singapore Management University (SMU). His research areas include meritocracy and inequality, career opportunities and subjective well-being, and economic-social issues related to the Singapore society. He has served as principal investigator or research advisor to the Ministry of Social and Family Development, National Youth Council, Strategic Group in the Prime Minister's Office, and the National Trades Union Congress. He teaches Macroeconomics of Income Distribution, and an experiential course Family and the Society. He has published on topics related to growth, inequality, happiness of youths, and challenges to social mobility in Singapore.

Associate Professor Intan Azura Mokhtar
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Associate Professor Intan Azura Mokhtar is Associate Professor and Director of the Community Leadership and Social Innovation Centre (CLASIC) in the Singapore Institute of Technology. Dr Intan has more than 20 years of teaching and academic experience, and has taught courses related to social context and innovation, change management, school and community leadership, and educational technology and policies, for Undergraduate and Master's degree programmes. Dr Intan has published widely on the above and has more than 80 publications to her name. She also served as an elected Member of Parliament in the 12th and 13th Parliament of Singapore, from 2011 to 2020.

Professor Jack Linchuan Qiu
Chair and Shaw Foundation Professor of Media Technology,
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Professor Jack Linchuan Qiu is the Chair and Shaw Foundation Professor of Media Technology at the Wee Kim Wee School of Communication and Information, Nanyang Technological University, Singapore. He has published more than 130 research articles and chapters and 11 books in English and Chinese including *Goodbye iSlave: A Manifesto for Digital Abolition* (University of Illinois P, 2016), *World Factory in the Information Age* (Guangxi Normal UP, 2013), and *Working-Class Network Society* (MIT Press, 2009). Recipient of the C. Edwin Baker Award for the Advancement of Scholarship on Media, Markets and Democracy, he collects workers' voices and conducts case studies in various Asian contexts, while collaborating with Fairwork and Platform Cooperativism Consortium, to promote labour sustainability in digital economies.

EDITORIAL BOARD MEMBERS

Ms K. Thanaletchimi
President of National Trades Union Congress, Singapore and
President of Healthcare Services Employees' Union, Singapore

Ms K. Thanaletchimi is an elected President of the National Trades Union Congress (NTUC) Central Committee, and President of the Healthcare Services Employees' Union. Concurrently, she chairs the Essential Domestic Services Cluster and NTUC Women's Committee. A veteran unionist, she was a Nominated Member of Parliament from 2016 to 2018 during which she leveraged her extensive experience to champion workers' interests, with an emphasis on women, family and healthcare issues. She received the National Day Award (Public Service Medal) in 2019 for her contributions. She also plays an integral role in rallying tripartite stakeholders to advocate training and job redesign so workers can enjoy fulfilling careers in the healthcare sector.

Professor Lim Sun Sun
Vice President, Partnerships and Engagement
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Professor Sun Sun Lim is Vice President, Partnerships & Engagement and Professor of Communication and Technology at Singapore Management University. She has researched extensively the social impact of technology, focusing on technology domestication, future of work and AI ethics. She has over 100 publications including *Transcendent Parenting—Raising Children in the Digital Age* (Oxford University Press, 2020) and articles in top journals including *Nature, Journal of Computer Mediated Communication* and *Big Data and Society*. She was a Nominated Member of the 13th Parliament of Singapore and an honoree of the Top 50 Asia Women Tech Leaders 2024 and Singapore 100 Women in Tech 2020 awards. She is also Fellow of the International Communication Association and Singapore Computer Society.

Mr Mike Thiruman
General Secretary
Singapore Teachers' Union, Singapore

Mr Mike Thiruman is a member of the NTUC Central Committee and the General Secretary of the Singapore Teachers' Union (STU). Active in the National Trades Union Congress since 2001, he has taken on several roles in various committees and entities such as the Job Re-creation Tripartite Workgroup Committee (2005 – 2011), NTUC Club, Public Sector Industrial Relations Committee, Membership Committee, Public Sector Cluster, International Relations Committee, International Relations Council and more. Mr Thiruman is also currently the NTUC EDS Cluster Chairman and Public Service Cluster Co-Chairman.

Associate Professor Randolph Tan
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Associate Professor Randolph Tan currently serves as the Director of the Centre for Applied Research at the Singapore University of Social Sciences (SUSS). His research interest lies in applied labour market research, changing demands in skills and the acquisition of in-demand skills to facilitate workers' transition to adjacent higher-skilled roles. Associate Professor Tan has conducted analysis on the changing profile of the labour market and has expressed his views on the Singapore Government's Budget on productivity, CPF, and the employment credit scheme.

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Dr Samuel Chng is a senior Research Fellow and heads the Urban Psychology Lab in the Lee Kuan Yew Centre for Innovative Cities at the Singapore University of Technology and Design. He is an applied social psychologist and his research focuses on human behaviour and decisions in cities across a range of areas including mobility, sustainability and wellbeing. His work is multidisciplinary and applied in nature, focusing on delivering practical and policy impacts.

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Mr Patrick Tay is Assistant Secretary-General of the National Trades Union Congress (NTUC) and Director of NTUC's Legal and Strategy departments. He is an elected Member of Parliament (Pioneer Single Member Constituency) and chairs the Government Parliamentary Committee for Education. He co-chaired the #EveryWorkerMatters Conversations Project Office and NTUC-SNEF PME Taskforce. Besides that, he is the Executive Secretary for United Workers of Electronics & Electrical Industries (UWEEI) and is also Deputy Chairperson, REACH Supervisory Panel and Chairman, West Coast Town Council.

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As a Deputy Director (Strategy) of the National Trades Union Congress, Dr Silin Yang conducts strategic research studies to identify emerging trends that impact workers and the Labour Movement. Silin holds a Doctor of Philosophy and has more than 15 years of experience in the education sector. Her current research focuses on freelancers, well-being and workers in SMEs.

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Ms Cindy Toh is a Senior Specialist of Strategy at the National Trades Union Congress, where she conducts strategic research on labour trends and issues to guide organisational growth and development. Her current research focuses on worker well-being and profiling freelancers and self-employed persons in Singapore.

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As Senior Specialist (Strategy) of the National Trades Union Congress, Mr Hariharan conducts strategic research on emerging labour trends, translating insights into actionable recommendations. With more than 8 years in public sentiment analysis, his current research focuses on understanding the needs and aspirations of workers in SMEs.

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