



Chapter 9

Skills Development System: Soft Infrastructure for Leapfrogging and Feedback

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The Need for a Skills Development System in the Era of the Third Unbundling

In the modern economy, a skilled workforce plays a central role. The expanding use of technology will transform traditional sectors and create high demand for a workforce with complementary skills. Technology could make the production process more capital-intensive by automating labour-intensive tasks. As firms reorganise their production activities around digital technology and automation, skilled human resources will determine the growth and competitiveness of the Association of Southeast Asian Nations (ASEAN) economies. Therefore, ASEAN economies need to create a system that will equip workers with the necessary skills.

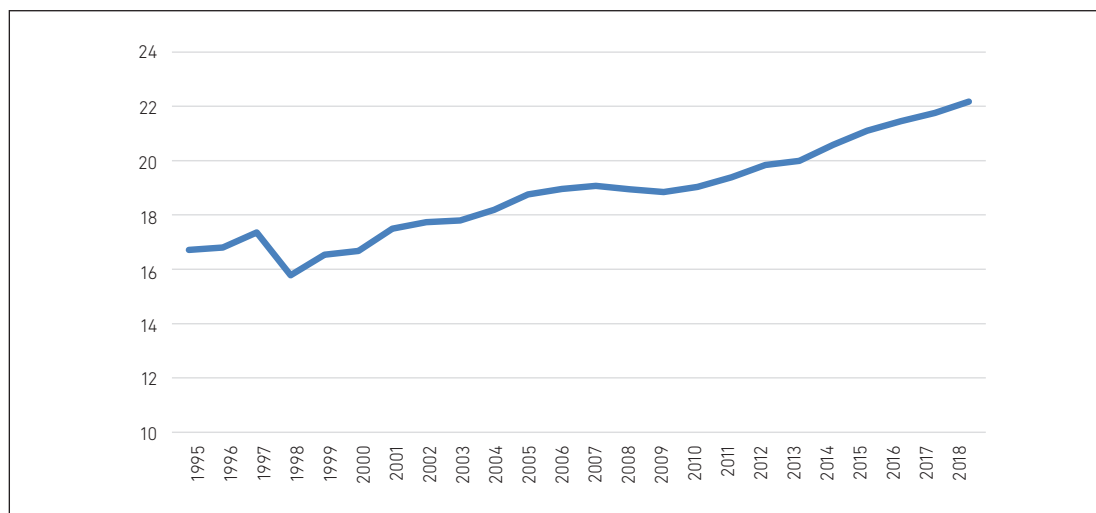
While technology is transforming economies, it is directly competing with human labour in doing many routine tasks. Essentially, jobs that mainly comprise tasks that can be routinised and automated will no longer be available for humans (ADB, 2018). When computers became commonplace in the United States, many tasks requiring mid-level skills went to the machines (Autor, Katz, and Kearney, 2006). Today, even highly skilled professional tasks are not immune – artificial intelligence (AI) is now better at recognising lung cancer than human doctors (Grady, 2020). Many workers in ASEAN are employed in jobs that have a high likelihood of automation (Chang and Huynh, 2016). Individuals, businesses, and policymakers – worried that increasing automation will make human labour obsolete – are seeking ways to avoid a future where machines displace humans in completing routine and non-cognitive tasks. To ensure this, it is essential for workers to develop skills that cannot easily be automated.

Technology also plays a crucial role in the services sector, which is a large employer in itself and supports the modern manufacturing and agricultural sector. It is now widely understood that a thriving tradable sector requires efficient local services such as transportation and logistics (Findlay and Pangestu, 2016). However, it is uncertain whether the services sector can engender improvements in the living standards of unskilled workers without a substantial increase in the skills of service providers. The low-skilled services sector is not known for a rapid increase in productivity, although improvements in technology may be transforming this sector. Thus, workers in this sector will quickly need to develop the skills to work with new technology.

While technology creates new economic activities and opportunities for growth during the era of the third unbundling, human capital will be necessary to spread the benefits widely and to foster inclusive growth. During the first and second unbundlings, ASEAN enjoyed growth and structural transformation through the creation of relatively well-paid, low-skilled jobs that could be relied upon to drive growth and poverty reduction. Figure 9.1 shows ASEAN's employment rate in the manufacturing sector. These jobs

made intensive use of the large labour force to carry out highly labour-intensive but simple manufacturing tasks that could easily be accomplished by the existing workforce. During this period, Asia became a haven for the production of intermediate goods and assembly, making this region the world's factory. In 1990, Asia produced about a quarter of the world's manufacturing output; by 2015, led by China, that share has risen to almost 50% (The Economist, 2015). A more important achievement was the rapid reduction in poverty and improvement in living standards.

Figure 9.1 ASEAN Manufacturing Employment, 1995–2018 (%)

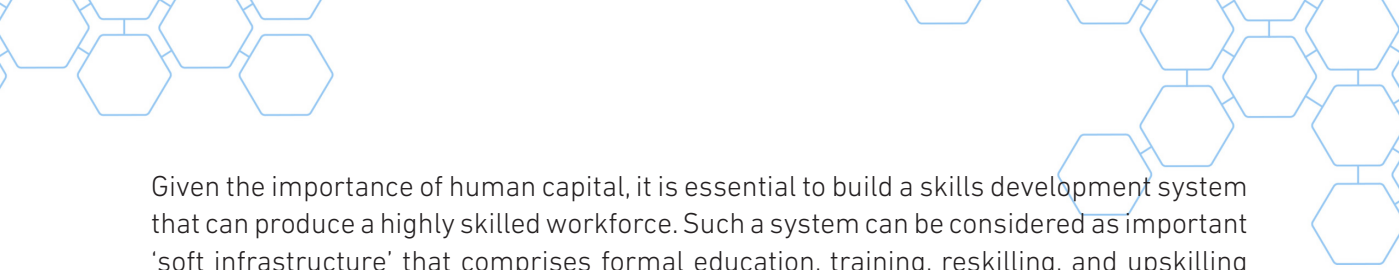


ASEAN = Association of Southeast Asian Nations.

Note: The figure shows the trend in the manufacturing employment share in ASEAN, which is calculated as the population-weighted average of the 10 ASEAN Member States.

Source: Author's compilation from World Bank (n.d.), World Development Indicators. <http://datatopics.worldbank.org/world-development-indicators/> (accessed 13 August 2021).

During the first and second unbundlings, human resources development took place organically – skills development was not a strategic priority. Such complacency in human resources development was less of an issue when low-skilled jobs were plentiful, but it must be given high priority during the current era of the third unbundling to ensure inclusive growth. As Chinese wages increase and businesses look for new production locations, ASEAN Member States (AMS) cannot rely solely on attracting low-skilled jobs through offshoring by developed countries. The availability of cheaper production technology – data processing, AI, robotics, and machine learning – means that building complementary skills is essential. Skills are in greater demand, which means that human resources development is an important economic growth strategy. These developments are likely to leave low-skilled workers behind if adequate investment in human capital is not prioritised.



Given the importance of human capital, it is essential to build a skills development system that can produce a highly skilled workforce. Such a system can be considered as important 'soft infrastructure' that comprises formal education, training, reskilling, and upskilling opportunities for all workers. Building such infrastructure requires a deep understanding of the various dimensions of skills and how they are produced. Furthermore, the level of human capital depends on decisions made by a large number of individuals, rather than centralised decisions of policymakers. So, an effective skills development system needs to not only address the supply side (e.g. educational institutions), but also offer the right incentives and enabling environment to invest in personal growth.

Dimensions of Human Capital

The key idea behind human capital is that skills are like any other durable investible good that can be acquired at a cost. It formalises the notion that human capabilities are not immutable. Becker (1962) noted that any activity that increases physical and mental abilities, and thus improves people's income prospects, could be considered human capital investment. While 'human capital' is a more abstract concept, skill refers to the ability to perform job-related tasks.

Skills can be of various kinds – physical, cognitive, and non-cognitive – each of which contribute towards performing certain aspects of job tasks (World Bank, 2018). Changing technology alters the value of different types of skills. To maintain competitiveness and increase productivity, small and medium-sized enterprises need workers who can help them access modern technology. This requires an educated workforce that can easily learn about modern methods of production and implement them in business, e.g. workers with digital marketing abilities so that small firms can use digital tools to expand their business. Larger and globally oriented firms need workers with the ability to innovate and expand internationally. In addition to technical knowledge, this also requires the ability to work with foreign firms, process information, utilise big data, etc.

Various strands of economic literature can contribute to a better understanding of the process of human capital development. A multidimensional conceptualisation of human capital, involving cognitive and non-cognitive characteristics as well as health, is widely accepted. Thus, the education system, as well as the health system, will need to be upgraded to foster skills development. Each of the components of human capital has its own formative processes. Furthermore, various components interact with each other during the formative years.

It is also well established that household (parental) resources play a significant role in human capital formation, especially during early childhood (Currie and Almond, 2011). Amongst poor households, budget and credit constraints can preclude adequate investment in human capital. For women, non-economic factors such as cultural norms can hinder investment. Recent research has also pointed to the role of factors outside the household's control. These include environmental factors such as exposure to air pollution. The incentives provided by the local labour market to invest in certain types of skills are also important, which partly depend on the returns to such investment in the form of greater employment opportunities and income.

The joint determination of occupational and human capital choice is also important to consider. Individuals make choices about occupations and careers by weighing the rewards and costs of gaining occupation-specific skills. Such investment must compete with other beneficial uses of an individual's time and financial resources. Therefore, the level of human capital investment in a country is determined not only by the supply of training institutions, but also by other economic factors. For example, a high cost of skills acquisition may dissuade individuals from training for and entering an occupation even when monetary rewards are high. To develop a country's human capital organically, we need to pay attention to the incentives faced by individuals who make an economic decision about investing in skills and training.

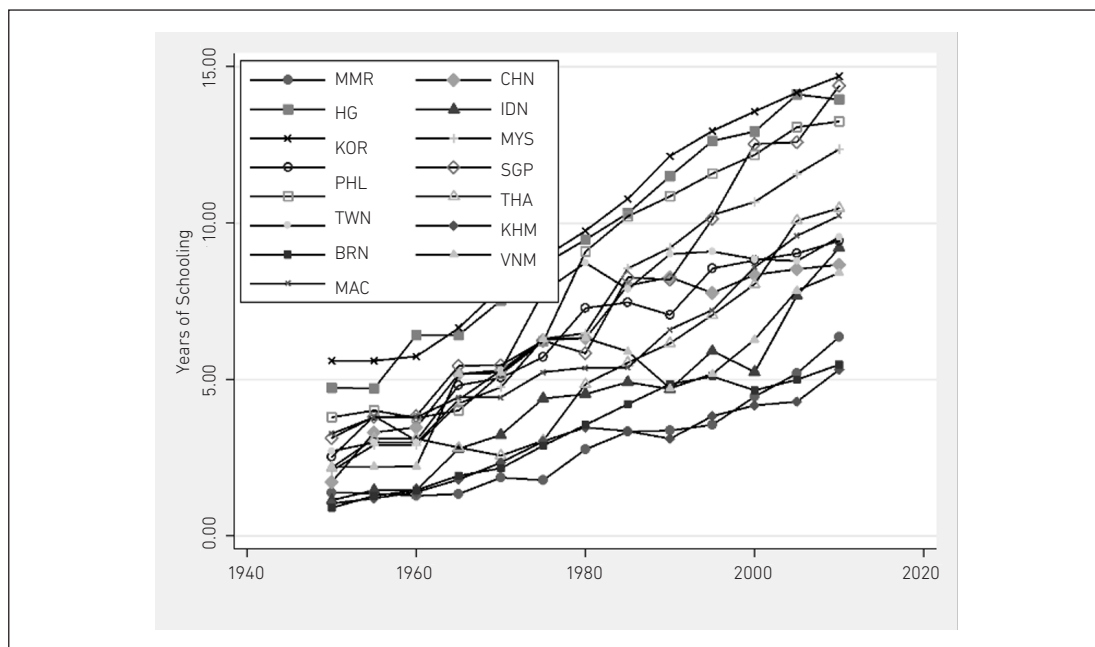
Skills Gap in ASEAN

Years of Schooling

The transition from growth driven by low-skilled jobs to growth driven by high-skilled jobs has been successfully completed by many developed Asian countries, including Hong Kong, Japan, the Republic of Korea (henceforth, Korea), Singapore, and Taiwan, (the Asian Tigers). The Asian Tigers' growth performance coincided with the rapid expansion in the quantity of education (Tilak, 2001). China is currently embarking on this transition. Looking to the future, middle-income AMS also need to make that transition over the next few decades if they are to continue their competitiveness.

In this regard, it is instructive to see how ASEAN economies stand vis-à-vis their East Asian counterparts in terms of human capital. Figure 9.2 shows the trends in years of completed schooling amongst 25- to 29-year-olds in selected East Asian countries. Although all countries have expanded the quantity of education, the gap between countries has widened over time, indicating a need for greater investment.

Figure 9.2 Trends in Years of Schooling for Individuals Aged 25–29



BRN = Brunei, CHN = China, HKG = Hong Kong, IDN = Indonesia, KHM = Cambodia, KOR = Republic of Korea, LAO = Lao PDR, MAC = Macao, MMR = Myanmar, MYS = Malaysia, PHL = Philippines, SGP = Singapore, THA = Thailand, TWN = Taiwan, VNM = Viet Nam.

Source: Barro and Lee (2013).

Human Capital Index

The current level of human capital in ASEAN varies across countries, as shown in Table 9.1 which is based on the Human Capital Index developed by the World Bank (World Bank, 2020). The Human Capital Index assesses the level of human capital based on the quantity and quality of education and health, showing a mixed picture. While the expected years of schooling are high (at least 9 years across all countries), the quality of education is low, resulting in lower learning-adjusted years of schooling. Similarly, scores on standardised tests also vary considerably across countries, with Singapore and Viet Nam leading the way and the Lao People’s Democratic Republic (Lao PDR) and Indonesia lagging. On the health side, early life mortality has been considerably reduced, but there is wider variation in stunting rates, which indicates long-term nutritional availability and is a strong predictor of adult labour market outcomes.

Table 9.1 World Bank Human Capital Index, 2020

Country name	Probability of survival to age 5	Expected years of school	Harmonised test scores	Learning-adjusted years of school	Fraction of children under 5 not stunted	Adult survival rate	Human Capital Index 2020
Brunei Darussalam	0.99	13.2	438	9.2	0.80	0.88	0.63
Cambodia	0.97	9.5	452	6.8	0.68	0.84	0.49
Indonesia	0.98	12.4	395	7.8	0.72	0.85	0.54
Lao PDR	0.95	10.6	368	6.3	0.67	0.82	0.46
Malaysia	0.99	12.5	446	8.9	0.79	0.88	0.61
Myanmar	0.95	10.0	425	6.8	0.71	0.80	0.48
Philippines	0.97	12.9	362	7.5	0.70	0.82	0.52
Singapore	1.00	13.9	575	12.8	N/A	0.95	0.88
Thailand	0.99	12.7	427	8.7	0.89	0.87	0.61
Viet Nam	0.98	12.9	519	10.7	0.76	0.87	0.69
Japan	0.1	0.0	-0.1	-0.1	0.1	0.1	0.2

N/A = not available.

Source: World Bank (2020).

Quality of Education and Human Resources

The low quality of schooling in some AMS bodes ill for skills development. Development organisations have expressed concern about the 'learning crisis', as schooling has not translated into knowledge gains in many developing countries (World Bank, 2017). Table 9.2 tabulates measures of education quality in ASEAN based on standardised test assessments. One comparative measure is the Programme for International Student Assessment (PISA), which tests 15-year-old students' literacy and numeracy proficiency. The AMS participating in the 2018 PISA (reported in Table 9.2) generally scored below the Organisation for Economic Co-operation and Development (OECD) average, except Singapore (one of the top performers worldwide). While knowledge and learning are important indicators of the quality of an education system, they do not directly correspond to the ability of the education system to produce productive workers.

To assess the labour market returns of different levels of education, we can compare the wage differential between workers with various education levels. In the latest available estimates, returns to education vary from 5.1 in the Lao PDR to 12.5 in Singapore (Montenegro and Patrinos, 2014). This means that an additional year of schooling increases wages by 5.1% in the Lao PDR, compared with 12.5% in Singapore. This variation could partly, but not completely, be explained by quality differences. For example, differences across countries in specialisation in skill-intensive sectors might lead to differences in observed wages across education levels.

Table 9.2 Measures of Educational Quality and Skills in ASEAN

Country	PISA 2018	Returns to education
Brunei	423	N/A
Cambodia	N/A	5.6 (2007)
Indonesia	382	10.4 (2010)
Lao PDR	N/A	5.1 (2008)
Malaysia	431	12.0 (2010)
Myanmar	N/A	N/A
Philippines	350	8.6 (2011)
Singapore	556	12.5 (1998)
Thailand	412	9.4 (2011)
Viet Nam	N/A	N/A
OECD average	488	–

– = not relevant, N/A = not available, OECD = Organisation for Economic Co-operation and Development, PISA = Programme for International Student Assessment.

Notes: The second column shows the average math, science, and literacy scores in the 2018 PISA. The third column shows the available estimate of returns to an additional year of schooling during the year in parentheses based on Montenegro and Patrinos (2014).

Source: Authors' compilation from various sources.

These statistics reveal that many workers in AMS are trapped in mid-level skill jobs even with high-level schooling, which is unlikely to be sufficient to succeed in the era of the third unbundling. In developed countries, which were the first to adopt technology in the workplace, job polarisation is observed (Autor, Dorn, and Hanson, 2016). Recent technological changes – computerisation in particular – have caused a decrease in the demand for labour in routine task-intensive jobs. Other explanations include offshoring. Similar issues may arise in AMS as technology plays an increasing role in the economy, so developing a strong skills development system to mitigate the ill effects of technology is necessary.

Lack of skills has led to unequal distribution of the benefits of economic growth within AMS. Integration into the global value chain (GVC) has played an important role in expanding trade in developing countries, with Southeast Asian countries benefitting particularly from the fragmentation of the production process (Rodrik, 2018). During this period, we have seen large reductions in poverty and improvement in living standards, some of which can be attributed to trade-induced economic growth. At the same time, however, policymakers have been forced to deal with the issue of rising inequality. Recent research has found that while GVC integration tends to increase formality and average wages, benefits largely accrue to skilled workers, as evidenced by a faster rise in the skills premium in GVC integrated sectors (Paweenawat, 2019).

GVCs, which ease developing countries' integration into the world markets, seem to have underdelivered with respect to employment growth (Rodrik, 2018). This is likely because high quality requirements mean that GVC activities are not complementary to the existing labour resources of the economy. The technological needs are greater than what is widely available in developing countries. Therefore, GVC integration tends to benefit a select few who have the necessary skills, rather than a wide group of individuals. This is reminiscent of earlier literature on the impact of globalisation on labour market outcomes in developing countries, which also found mixed results (Pavcnik, 2017).

The role of GVCs in exacerbating inequality means that government policies are necessary to spread the benefits. However, not all policies are created equal. Many developing country governments aim to rise up the value chain, which may not necessarily be pro-poor. This leads to some counterproductive policies such as restricting exports of raw materials in order to add more value (Athukorala and Patnuru, 2019). However, focusing on domestic value added to guide policy is counterproductive. Rather, broad-based growth can be generated by focusing more heavily on increasing the country's human capital.

Strategies to Develop a Skills Development System

Reform Formal Education

The formal education system is the most important aspect of the skills development system, where reforms need to be targeted. It is where most individuals spend their formative years, and thus can help lay a solid foundation for skills throughout life. The link from education to skills is obvious. Educated workers can easily adopt the latest technology. They can adapt to changing circumstances, process information better, and learn new techniques. Additional schooling may also provide workers with 'soft' skills that enable them to work together with others to improve collective productivity.

But the existing education system, which was developed during the era of the first and second unbundlings, needs to be updated to meet the challenges of the third unbundling. Almost all children in the region attend primary schooling, but this is no longer sufficient. Much work remains to be done on raising enrolment at the secondary and tertiary level and improving the overall quality of education. The changing nature of the skills required to accomplish tasks that are – so far – beyond the capability of computers has put greater pressure on improving education quality in ASEAN.

Governments can pursue many actions to improve their education systems:

- Develop a national strategy for human resources development: A national strategy built around fulfilling the need for highly skilled workers for the modern economy can provide the necessary political push for reform. Such a strategy guides policymaking across the government, and thus is crucial for coordinated reforms that are more likely to succeed.
- Legislative action: In many countries, education laws were developed decades ago, so updating them is necessary to align them with the new economic environment. Education laws should set standards, allocate spending, and maintain accountability consistent with the needs of the modern economy. Some ideas include identifying and empowering high-performing educational institutions that consistently perform well, and providing space for partnerships between educational institutions that produce a skilled workforce and the businesses that employ them.
- Quality improvement: It is crucial to ensure that the education provided is of a high standard, as it is shown to have consequences for not only short-term outcomes like exam scores but also lifetime earnings. The quality of an education system is determined by its physical infrastructure, curriculum, and teachers. This requires investing in the professional development of teachers, upgrading the infrastructure of schools, and developing a curriculum that fosters the development of both cognitive and non-cognitive skills that will be high demand in the modern labour market.
- Mainstreaming vocational education: Vocational education can significantly contribute to meeting the need for semi-skilled workers. It can also be nimbler in meeting the changing requirements of the labour market. However, in many cases, countries have separate laws governing general and vocational education – essentially creating two, often incompatible, tracks from which students must choose at a young age. It is possible to create a comprehensive education policy that coherently combines both general and vocational tracks into a policy package and that improves the perception of vocational education. This is important because the needs of the modern labour market include both general skills that can adapt to different situations, and specific skills that help students transition into the labour force.
- Role of the non-government sector: The role of the private sector should not only be in the provision of education service but also in partnering with the government to improve the education system. The private sector can achieve cost efficiencies, but the government still needs to have equity goals in mind. Another aspect of the involvement of the non-government sector is to improve linkages between industry and educational institutions, particularly in the vocational and higher education sector. Employers should be encouraged to participate in curriculum and course design or engage in teaching. For instance, technology companies such as Google, IBM, and SAP offer many training programmes in digital skills. However, one key question relates to more widespread recognition of these fragmented training programmes.

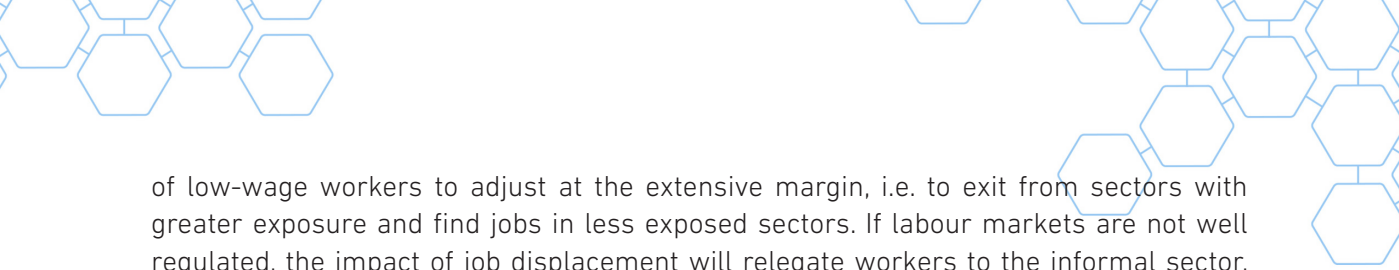
Reskilling and Upskilling the Existing Workforce

Reskilling and upskilling are necessary to upgrade the skill levels of those already in the workforce in order to address the concern of the replacement of humans by machines and other technology in performing certain types of jobs, as well as to take advantage of new opportunities offered by technology. For developing East Asia, where labour-intensive sectors have driven economic growth for the last 15 years, concerns about the impact of technology on future job creation are understandable. Workers in the textile, clothing, and footwear industry, which employs a large share of workers in Southeast Asia, are vulnerable due to the labour-intensive nature of their tasks. According to the International Labour Organisation (ILO, 2018, more than half of the workers in Southeast Asian countries face the risk of job loss due to automation in the next two decades. In services, industries such as hotels and restaurants, and wholesale and retail trade will be most affected.

Reskilling and upskilling strategies need to focus on sectors that have a greater risk of job displacement due to changing technology. According to the framework used by the Asian Development Bank (ADB, 2018), industries with a high concentration of jobs that are intensive in routine and manual tasks have the highest likelihood of automation. Jobs on the production line are usually routine and manual, and we already see them being automated. For example, car assembly lines mainly use robots. A sector's share of routine manual jobs determines the degree to which that sector may be affected by new technology.

Reskilling entails providing workers with an adjacent set of skills that is closely related to the existing skillset, enabling them to perform tasks that cannot be done by technology. For example, assembly line workers could be trained to conduct quality control while some of their assembly tasks are conducted by machines. Most of the reskilling would require inculcating comfort in interaction with technology, including business use of smartphones and computers. Upskilling requires a more dramatic change in the workers' skillset and may require a more intensive retraining programme. This will be important in industries that face wholesale replacement by machines in job tasks. Depending upon the innate ability of the workers, existing skills, and realities of the economic conditions, either reskilling or upskilling could be pursued.

Reskilling and upskilling can foster job mobility, which is quite important. Workers who cannot repurpose their skills and utilise them in new sectors bear the brunt of the negative effects of structural change induced by technology. The main driver of unemployment is not increased job separation, but a lower job-finding rate. Autor, Dorn, and Hanson (2013) found that workers in the lowest tercile face a larger effect from exposure to a negative shock than workers at the top end. Furthermore, this effect is driven by the lower ability



of low-wage workers to adjust at the extensive margin, i.e. to exit from sectors with greater exposure and find jobs in less exposed sectors. If labour markets are not well regulated, the impact of job displacement will relegate workers to the informal sector, where earnings and job benefits are lower.

Much of the reskilling could take place at the workplace itself, but it is not costless. The employer usually faces a choice between reskilling current workers or sacking them and hiring new ones. The decision is usually based on the relative costs of the two approaches. Analysis by the World Economic Forum (2018) estimated that, in the United States, the private sector could reskill 25%–30% of at-risk workers at a positive benefit–cost ratio. Some displacement is inevitable, so the government needs to step in to provide reskilling and upskilling services to support displaced workers so that they can be gainfully employed in emerging sectors. Such services could focus on providing short-term training to workers on specific skills. There are many examples of interventions, with mixed results. Training has to cater to local economic conditions and partnerships with the business sector are also crucial.

Reskilling and upskilling are related to a broader concept of 'lifelong learning', where skills acquisition takes place throughout our lifetimes. Lifelong learning is an 'organizing principle of education covering all phases of life and all forms of learning' (Yorozu, 2017: 11). Fostering lifelong learning is needed to ensure that individuals can adapt to future disruptions in the economic landscape, which is inevitable but also unpredictable. The ability to adapt to changing circumstances essentially requires a certain kind of ability to process new information and make decisions based on available data.

Developing a robust skills development system with elements of lifelong learning requires rethinking some elements of the existing system. Lifelong learning could be pursued by anyone and in various forms – including formal (in a training institution), informal (on-the-job), and non-formal arrangements. This could happen in community learning centres, online learning platforms, and professional development seminars. As it is such a decentralised process, it requires wide-ranging policy actions that complement each other (ILO, 2019). These could include employment placement services, training programmes, skilling incentives, and labour market legislations.

The crux of lifelong learning is the recognition of non-formal and informal schooling, including self-learning. The key question is how to recognise skills gained outside the formal system. Formally, this could take place through testing, which requires the development of a qualification framework. Informally, assessment could be done through peer recognition and endorsement via a professional network. Ultimately, employers are the best adjudicators of a candidate's skills, which means that policy could focus on improvement of the recruitment process.

Conclusion

Technology is having a profound impact on the economies of Southeast Asia, creating new opportunities for growth by ushering in the era of the third unbundling but also causing fears of job displacement and rising inequality. The loss of advantage conferred by cheap labour could result in a concentration of production tasks in developed countries. Therefore, industries that specialise in the labour-intensive part of the supply chain may see jobs evaporate. To maximise the benefits of technology for all workers, countries need to focus on an effective skills development system that increases the capabilities of the workforce.

Human capital plays a distinguished role in the era of the third unbundling. It will enable ASEAN economies to pursue 'leapfrogging' and 'feedback' while reviewing the existing 'step-by-step' development strategy, as discussed in Chapter 2. The type of skills needed will be varied. It includes technical and cognitive skills, problem-solving skills, and soft and social skills. The mode of providing these skills will also vary – including a formal general education system, industry-specific vocational education, reskilling and upskilling opportunities for existing workers, and fostering the notion of lifelong learning.

Given the status of skills in the region, policymakers in each AMS need to prioritise reforms that improve the quality of their human resources. They need to develop a national strategy for skills development to coordinate the actions of disparate government agencies, adopt regulations suitable for the technological era, ensure access to skills development for all citizens, improve the quality of schools, and work together with the private sector. The education system must be upgraded to deliver skills that will be prized in the future labour market. This means reassessing what and how students are taught, focusing not just on academic knowledge but also on social and emotional intelligence. This also means forging better partnerships between educational institutions and industry to mitigate the gap between the skills that workers learn and what businesses need. The reforms are needed to ensure that the gains from modern technology are spread to every worker.

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