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## Can ASEAN Expand Vocational Training to Help Workers Survive Automation and AI?

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# AsiaPacific

I S S U E S

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*Papers in the AsiaPacific Issues series feature topics of broad interest and significant impact relevant to current and emerging policy debates. The views expressed are those of the author and not necessarily those of the Center.*

**SUMMARY** The countries of the Association of Southeast Asian Nations (ASEAN) have cumulatively vaulted from the world's seventh-largest economy to the fifth, in 2019, in only three years.<sup>1</sup> But several challenges threaten future economic growth. Chief among them is demographic change: populations across ASEAN are aging and birthrates are declining. One outcome will be labor shortages. The shrinking labor pool could serve as a strong driver for automation. But while automation may reduce input costs and boost growth, it could change the skills employers desire, resulting in the obsolescence of many low-skilled jobs, leaving current workers without the skills necessary to obtain work. Upskilling labor through vocational education and related programs is the obvious response. But ASEAN education systems have never included significant vocational opportunities. With technological change accelerating, ASEAN states will need help with the herculean task of rapidly remodeling their education systems.

*The ILO estimates technological change could displace half of ASEAN's workforce over the next two decades*

## INTRODUCTION

In recent decades, the countries of the Association of Southeast Asian Nations (ASEAN) have enjoyed massive economic growth: in 2019, the region's economy was estimated to be the fifth-largest in the world, at nearly 3 trillion dollars. Only three years prior, it was estimated to be the seventh-largest.<sup>2</sup> Threats to that steady growth have been evident for some time in the form of aging populations and falling birthrates. Now ASEAN, along with the rest of the world, is facing a new challenge: the increasingly disruptive effects of new technology on labor markets, referred to as "the Fourth Industrial Revolution."

## TECHNOLOGICAL DISRUPTION

With significant portions of the population aging out of the workforce and fewer young people replacing them, increased labor shortage will put upward pressures on wages. Already across the region, average wages have risen to 80 percent of the global average as of 2019, which makes producing goods within Southeast Asia more expensive.<sup>3</sup> Higher wages, while not always harmful to the job market, risk companies shifting production to nations with lower wages or reducing costs through automation. Increased automation will affect lower-skilled and routinized labor, resulting in those with less education and fewer skills being disproportionately affected by new technologies.

In the most developed ASEAN economies, the effects of increased reliance on artificial intelligence (AI) and automation equipment will contribute to reductions in the demand for labor across all sectors. Not only will computer programs and AI likely replace phone operators and customer- and call-service employees, but these innovations will eliminate workers in industries ranging from the manufacturing of cars and electronic devices to clothing and footwear. Changes in agricultural employment are also underway, though lagging largely due to slow adoption. While technology ranging from

software applications to drones that strategically spray pesticides has been developed, only 2.5 percent of 71 million farmers are using digital solutions proposed by Grow Asia, a partnership platform created by the World Economic Forum and the ASEAN Secretariat.<sup>4</sup> Other economic sectors are aggressively adopting technology, and the International Labor Organization (ILO) estimates technological change could displace half of ASEAN's workforce over the next two decades.<sup>5</sup> The likely result of this displacement, if alternative employment opportunities do not exist, will be a drop in household consumption, increased reliance on safety nets, and a decline in the economies of ASEAN member states.

In Indonesia alone, job losses due to new technologies could result in USD 21.8 billion in lost income.<sup>6</sup> In automotive manufacturing, 60 percent of workers may lose their jobs, while in the country's textile industry, where labor disruption is projected to be greatest, 64 percent of Indonesian workers are expected to be displaced. Estimates of displaced textile workers—a major industry in much of the region—are even higher in the less-developed ASEAN countries, reaching 86 percent in Vietnam and 88 percent in Cambodia. Because textiles are a major source of jobs, especially for women—exceeding 70 percent of the industry's 9 million-person labor force across several ASEAN countries, including in Vietnam, Laos, and Cambodia—disruption in the sector (which includes clothing and footwear) will have an outsized effect on women. The textile industry is also the sector most likely to be disrupted by 3-D printing and sewbots, robots that stitch fabric. Sewbots and 3D printing will enable production reshoring by reducing the cost of producing textiles to the point where it may no longer be profitable to operate textile factories in ASEAN states rather than in the countries where those textiles will be sold.<sup>7</sup> In the Philippines, business processes outsourcing (BPO) plays a major role in the economy, providing over one million jobs in call centers, IT, human resources, data entry, and other fields.<sup>8</sup> Women hold 59

percent of these jobs. But according to the ILO, 89 percent of BPO jobs are at high risk. Making the challenge more urgent, at least for the Philippines, is the fact that software automation can reduce costs by 40–75 percent, resulting in further incentives for companies to automate these processes as soon as possible.<sup>9</sup>

Even countries that have embraced planning for automation as a route to increased productivity may be unprepared for the effects that intensive automation may unleash. Thailand for instance, announced an economic plan titled Thailand 4.0, aiming to move Thailand from a middle-income country to a high-income country by extensively automating the manufacturing center and increasing the skills of its national workforce. The Thai government did not lack in ambition, aiming to have 50 percent of the nation's manufacturing automated by 2021. But the plan was met with skepticism by the Thailand Development Research Institute, which has predicted that the Thailand 4.0 economic plan will need double the time the government has allotted, ten years rather than five. Furthermore, under the current plan, Thailand 4.0 will result in substantial unemployment, including large job losses (for example: 73 percent of Thai workers in automotive manufacturing could be displaced).<sup>10</sup>

In a country with a labor shortage, like Thailand, some of those who lose their jobs may find more work, but much of the labor demand is in jobs that require different skill sets than those that automation generally renders obsolete. Not all countries in ASEAN, however, are developing at the same pace. In the Philippines, where the population is still growing, the government will face the challenge of accommodating a population boom with a shrinking labor market amid an insufficient education system.<sup>11</sup> Laos and Cambodia, for instance, are largely agrarian, and do not currently have the economic development necessary to substantively participate in the Fourth Industrial Revolution.

The countries more likely to face challenges in the near term are the five founding members

of ASEAN (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) and Brunei, today the most developed in the regional bloc. Even then, investment and increasing development take time. Factories are not automated overnight. Instead, the issue of technological disruption is a longer-term one, creating an incentive to invest in immediate problems rather than one whose full impact will not be felt for several years.

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### **VOCATIONAL EDUCATION AND TRAINING**

As demand for technological skills grows, few workers have easily transferable skills or even the educational foundation of a college degree (e.g., 90 percent in Cambodia, 75 percent in Vietnam, and around 67 percent in both Thailand and Indonesia do not have a college degree).<sup>12</sup> Even when a person has a college degree, it is no guarantee of a job. Tanit Sorat, vice-president of the Employer's Confederation of Thai Trade and Industry, expects only 20 percent of current college graduates will have a job within 6 months; the rest may have to wait up to three years. He blames educational mismanagement, citing the failure of universities to develop programs that meet the demands of Thai industry.<sup>13</sup> For most students, a seven-year stretch from starting college to getting a job is too long. To create an employable population, countries need to further develop and update, and rely more heavily on, their technical and vocational education and training systems (TVET).

In the changing job market, technical and vocational education and training have advantages over conventional higher education. First, the primary goal of TVET is to acquire concrete skills, which are immediately transferable into a job. Second, unlike college, which traditionally can take three to four or more years to complete, most vocational education programs are shorter, ranging from under a year to three years. Third, technical education systems, when managed correctly, communicate with local businesses concerning labor force demand, thus training students for in-demand skills.

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ASEAN has been working to improve vocational education. Part of the ASEAN Economic Community's goals is the free flow of skilled labor. To aid in achieving that goal, ASEAN countries have begun to develop a certification scheme. These programs, named the National Qualifications Frameworks, aim at standardizing the skills taught across the region, enabling a person trained in the Philippines, for example, to work in Thailand, thus ameliorating the challenge of lost jobs and shrinking labor opportunities.

#### **VOCATIONAL TRAINING FACES HURDLES**

The success of new vocational programs will rely on how prepared students are to participate, enthusiasm for the programs, and funding and execution.

**Poor educational foundations.** Significant factors in the potential success of technical and vocational training are the constraints on education systems that feed TVET. While some countries, such as Singapore, have sufficient educational capital to train and retool with new skills some of their existing workforce, other ASEAN member states do not. Indeed, the Philippines and Indonesia ranked near the bottom of an Organisation for Economic Co-operation and Development (OECD) study of educational indicators for reading abilities.<sup>14</sup> Philippine literacy remains poor, and the country's funding for education is 90 percent lower than the OECD average.<sup>15</sup> In turn, this means that many students do not have the foundation needed for additional education, whether at a technical school or at a college. Of the six countries assessed in the study, five placed below the OECD average.<sup>16</sup> If governments do not act to retrain their populations, many people will remain unemployed or underemployed. Educational shortcomings are a major challenge, and the negative consequences will become worse as the economies of ASEAN states continue to develop. Countries must begin to place more emphasis on vocational training and education and continue to improve foundational knowledge in reading, along

with math. The current level of academic achievement limits the ability of students to benefit from technical and vocational training.

**Reputation, quality, and funding.** As an educational option, vocational education is viewed by many as decidedly 'second rank,' lacking the prestige of a college degree, and is stigmatized as being for slackers and those without the intellectual skills necessary to attend college.<sup>17</sup> The system also faces qualitative and fiscal shortages. Some of these challenges are systemic. In Myanmar, 19 ministries play some role in TVET. In Cambodia, there are shortages of teaching supplies and a lack of teacher training in TVET. In Indonesia, whose working-age population is expected to be 70 percent of the total population by 2030, TVET education is undermined by the many teachers who lack the qualifications required by Indonesian law. Countries are taking steps to solve these issues. Since the quality of teachers has a major effect on learning outcomes, Indonesia is working to improve teaching quality. The country has also indicated it would like 70 percent of students who plan to enter high schools that typically lead to college to go, instead, to technical schools.<sup>18</sup> It has expanded the number of technical high schools, now numbering over 13,000, and has invested 719 million rupiah in TVET, a plan it accelerated to boost its economy in response to COVID-19.<sup>19</sup> Nor is Indonesia alone. In 2016, Myanmar announced the National Education Strategic Plan to expand access to vocational education, expand skills-based programs, and carry out TVET management reform within the country.<sup>20</sup>

Singapore has gone even further and adopted a lifelong learning policy called "Skillsfuture." Launched in 2015, Skillsfuture helps support people who are continuing their education by subsidizing their classes. It is available to all Singaporean residents and aims to develop an integrated educational system that evolves alongside the country's needs by working closely with employers within the city-state. This is in addition to Singapore's investment in polytechnic universi-

*Both the United States and Japan have experience in investing in Southeast Asian TVET programs*

ties and its Institute of Technical Education (ITE) program. Singapore invested 465 million Singaporean dollars into its ITE program in 2016, and over a billion dollars into its polytechnic universities. The ITE program has been so successful that 25 percent of secondary school leavers join it for vocational education.<sup>21</sup> Singapore, however, is by far the wealthiest of the ASEAN states and can invest far higher amounts of money into its TVET programs. Other states need outside support to improve their TVET programs. The United States and Japan, as major global economies, would be wise to make substantial investments in ASEAN vocational training efforts as a contribution to the region's economic and political stability.

Along with many forces, the effects of COVID-19 plays a role in the pace of economic development. A damaging, if not devastating, economic downturn may affect much of the region. For instance, the International Monetary Fund (IMF) has downgraded Vietnam's annual growth estimate from 7 percent to 2.7 percent. Thailand has already lost 7 million jobs, and that number may reach as high as 10 million.<sup>22</sup> Furthermore, intra-ASEAN trade is being affected: Malaysia and Thailand have closed their borders in an attempt to halt the spread of COVID-19, and Indonesia has declared a Non-Natural national disaster.<sup>23</sup>

<sup>24</sup> The long-term repercussions in relation to the adoption of automation and AI are difficult to predict. In one scenario, the economic downturn and greater fiscal pressures lead ASEAN states to scale back their more ambitious TVET programs, reducing the trained labor force and the ability of businesses to aggressively automate. In the second scenario, ASEAN states that since the 1997 Asian financial crisis have continued to improve the resiliency of their economies may consider automation and AI essential tools, and push both aggressively, in spite of potential economic and fiscal limitations.

If the former scenario occurs, the slower shift toward TVET education may benefit these countries. However, if the latter scenario occurs, and nations adopt automation and AI more rapidly,

new TVET policies may have to be enacted soon to assure both employment for workers and employees for firms.

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**THE UNITED STATES AND JAPAN CAN PLAY A ROLE**

If ASEAN nations decide to move ahead with AI and automation, more investment will be required for TVET to develop to its potential. The costs of reforming education systems across the region are likely to be too great for ASEAN to cover alone. Here, the United States and Japan could help ASEAN to meet these challenges. Both the United States and Japan have experience in investing in Southeast Asian TVET programs. Japan is currently the largest investor in ASEAN, and through the Japan International Cooperation Agency (JICA) has previously funded vocational education programs going back to the 1980s and spanning the region from the Philippines to Thailand. In Thailand, for instance, Japan funded the construction and development of vocational education programs in three Thai provinces: Prachinburi, Chanthaburi, and Trat. The result was educational programs training students in 26 courses including construction, car repair, marketing, accounting, and herbal medicine.

The initial challenge a US-Japan joint program would face is the possibility that entrants in training programs will not have an adequate educational foundation. Remedial education is likely to be necessary. Providing students in-person training in basic skills would be costly in both time and money. A better alternative is the utilization of online learning. While internet penetration varies among countries in ASEAN, those most likely to immediately be affected by the Fourth Industrial Revolution have the greatest access. In Malaysia, Singapore, and Brunei, more than 80 percent of the population has internet access (compared to internet penetration rates around 60 percent in Vietnam and Thailand).<sup>25</sup> Internet penetration will likely increase in the near future, as Japan and the European Union (EU) have come to a digital infrastructure and development agreement called the Partnership on Sustainable Connectivity and

*Factories will likely hire far fewer people who can build a car and hire far more of those who can repair the robot that builds the car*

Quality Infrastructure. The agreement focuses on using Japan's and the EU's economic strengths and technological know-how to aid in the development of digital infrastructure and the promotion of shared norms of a rules-based system. This agreement comes at an opportune time for ASEAN.

The agreement could facilitate an opportunity for the United States and Japan to develop and fund a prevocational online training program, aiming to improve basic skills in math and literacy. To ameliorate concerns about data localization (in which users' information is stored and used or sold by providers) and enable ASEAN states to be more involved in the process, ASEAN countries would participate in program development. Involving local tech companies would enable the programs to be adapted to each country's needs and assure that the programs can be improved over time. The result would be an educational product that can be utilized in both educationally underserved areas and by individuals anywhere.

One potential model is the Young Southeast Asian Leaders Initiative's (YSEALI) online courses, which enable students in ASEAN countries to gain certifications by taking online classes taught by university professors in the United States. While the system would likely have to scale up over time, according to YSEALI over 100,000 Southeast Asian youth have joined the program already. Currently, the online curriculum, called YSEALI Learns, is limited to business courses but works as a proof of concept that the United States can operate online classes effectively in a foreign country. The course options could be expanded to include math, science, and reading. The United States previously funded a program called the Lower-Mekong Initiative: Connecting the Mekong through Education and Training. Run by the United States Agency for International Development (USAID) in the period 2014-2019, the program trained over 60,000 students and 1,000 teachers in Cambodia, Laos, Myanmar, and Vietnam.<sup>26</sup> Thus, a large-scale skills training and development program is not impossible or even unlikely.

An additional challenge will be to create programs that teach skills necessary for the Fourth Industrial Revolution—and these are different from those taught at today's TVET programs across ASEAN. Currently, programs focus on engineering, agriculture, accounting, and electronics.<sup>27</sup> While many of these skills may retain their usefulness on a smaller scale, as digital economies begin to develop, demand will shift toward skill sets in robotics, software development, and other tech fields. Factories will likely hire far fewer people who can build a car and hire far more of those who can repair the robot that builds the car.

To resolve this challenge, new educational infrastructure accommodating more students and new teaching methods will need to be developed. Japan, a long-time developer of infrastructure in the region, could spearhead development. Moreover, such infrastructure could exemplify the potential of the Blue Dot Network certification scheme. Currently, the Blue Dot Network is little more than a concept agreed to by Australia, Japan, and the United States that promotes infrastructure development that mobilizes private investment and meets standards for transparency, sustainability, and impact. By utilizing the Blue Dot network in these infrastructure projects, the network would get visibility and the projects could be used as a proof of concept for the network as a whole. Investment in materials, such as computers, as well as in teachers, is at least as important. Since the new economy will demand skills related to computing or robotics, teachers experienced in these areas, whether from Japan, the United States, or elsewhere, should be utilized. Online classes taught by certified professors can be recorded and disseminated as preparation for the TVET programs themselves, and as ASEAN citizens gain experience in the digital economy, they can take over as teachers for the next generation of students.

Since the economies of ASEAN are varied in their economic development, people in agricultural countries (such as Laos) who do not yet need digital skills to find employment should be trained in skills that will be needed as their economies

*US-Japan investment in TVET would facilitate economic resilience in ASEAN and strengthen the region's economic ties with both countries*

develop. While digital technology is coming to agriculture, and will have effects on labor demand, employment, and income, the pace of adoption in Southeast Asia is slow due to the cost. In the future, agritech startups in the region will likely find ways to make the technology more affordable.<sup>28</sup> Until then, manufacturing and engineering would be necessary skills for the future. A near-ideal situation may be to model Thailand and others as they shift towards digital economies and advanced manufacturing practices. Less-developed countries could absorb the manufacturing jobs that have been shed by the more-developed countries, thus enabling their own economic growth, and giving them access to the educational resources necessary to generate a knowledgeable workforce able to take advantage of emerging opportunities.

## CONCLUSION

Averting a long-term economic decline in ASEAN because of labor shortages and high rates of unemployment would be economically beneficial to the global economy. A TVET initiative would be an effective way to help adapt ASEAN's current workforce into one that can meaningfully compete in a digital economy. The alternative is likely large-scale unemployment and related pressures on national economies and social safety nets. The cost of such an initiative would be enormous,

and ASEAN would understandably look to both Japan and the United States for help. Though selling this program to domestic markets might be challenging to US and Japanese officials, both the United States and Japan would benefit from continued growth within ASEAN. If the United States and Japan came forward with a plan for expanded TVET programs, it would likely be widely supported by ASEAN states. Renewed investment would facilitate economic resilience in ASEAN and strengthen the region's economic ties with both the United States and Japan. Additionally, US and Japanese involvement in training Southeast Asia's workers in coding and digital development could influence digital norms in ASEAN, something both countries would like to do. Vocational training will not by itself avoid the unemployment caused by technological disruption, but it would reduce its scale. ASEAN states need to invest in lifelong learning, as Singapore has been doing. Vocational education is only the first step. As technology continues to evolve, new jobs will be created, but they will be jobs demanding new and different skill sets. It is thus crucial that ASEAN governments provide their people the training needed to re-tool their skills. Japan and the United States are in position to help ASEAN countries do just that. Doing so will benefit the regional and global economies, the people of ASEAN, and relations among Japan, the United States, and ASEAN.

## NOTES

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