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ASEAN education cooperation: An assessment of the education divide and measuring the potential impact of its elimination

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ADBI Working Paper Series

**ASEAN EDUCATION COOPERATION:
AN ASSESSMENT OF THE EDUCATION
DIVIDE AND MEASURING THE
POTENTIAL IMPACT OF ITS ELIMINATION**

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and Badri Narayanan

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Abstract

Quality education is a key determinant for ASEAN's aspiration to be a single market and production base and to attract foreign investment. However, the region is characterized by an education divide in terms of quality and output, and this is likely to increase in the post-COVID-19 period. A simulation, modeling a productivity increase in the education sector through an increase in the HDI-Education Index for lagging ASEAN countries to the level of Singapore (benchmark country), shows that GDP, exports, and consumption are poised to go up much more for the countries that lag farther behind Singapore in their education quality. This provides an incentive to ASEAN countries to pay more attention to education cooperation, particularly in terms of setting regional targets for improved education quality and output at national level while linking education more intrinsically to ASEAN economic cooperation.

Keywords: ASEAN, education, economic development

JEL Classification: I21, R11

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1. INTRODUCTION

ASEAN regional integration has long been characterized by a development divide. Soon after the accession of the last ASEAN member in 1999, the region was feared to be divided into a two-tier structure between the old ASEAN members and the newer ones (Severino 2007). The divide was cited not only for per capita income, but also for level of human development, availability of transport, and digital infrastructure. There are also gaps in institutional and human capacities that make it difficult for all ASEAN countries to raise their productive ability together, thus constraining their ability to develop a single market and production base as espoused in the ASEAN Economic Community (AEC) Blueprint¹ (Basu Das and Salazar 2007).

COVID-19 has further increased this disparity among ASEAN countries. The blow dealt by the pandemic was felt differently by the ten economies across all indicators of COVID-19 (i.e., number of infections, deaths, and tests conducted). ASEAN countries employed different ways to contain the spread of the virus, which could be observed in the form of mobility restrictions and duration of containment and control measures. There were also significant differences in the size of budgetary support, pace of utilization of the additional resource, focus areas of government expenditure, and financial assistance to businesses (Lee et al. 2020). Moreover, the pandemic highlighted some fundamental issues in most of these economies, contributing to the differences in terms of readiness. For example, around half of ASEAN countries suffer from a weak healthcare system, including Cambodia, the Philippines, the Lao PDR, and Indonesia. There is a lack of uniformity in digital accessibility across ASEAN residents, and more than 50% of the ASEAN population remains offline. This became a challenge during the pandemic, as people in ASEAN did not have equal access to information and even suffered in areas of their daily livelihood (UN 2020).

COVID-19 exposed vulnerabilities in the education sector of ASEAN countries as well. The sector plays a pivotal role in building AEC. The regional documents in ASEAN, including the ASEAN Socio-Cultural Community and ASEAN Education Work Plan, identify education as a fundamental public good and highlight its importance for improved human development capacity and mobility of skilled labor in the region. The ASEAN Work Plan on Education 2016–2020 aimed to enhance access to and the quality of basic education² and increase the use of ICTs for all levels of education (ASEAN Document undated). All of these have implications over time for acquiring advanced skills and improving employment prospects. These also have implication for enhanced economic competitiveness in terms of increasing trade and investment, leading to ASEAN's greater engagement with the global economy. Despite its importance, ASEAN countries face an education divide. The gap, although limited in terms of enrollment rate, is relatively higher when considering quality, measured in terms of pupil-student ratio, use of ICTs, infrastructure, and others. Greater differences exist in learning levels, which is reflected in international test scores (such as PISA) and the UNDP Human Development Index.

¹ The ASEAN Economic Community is one of the three pillars of the ASEAN Community. The other two pillars are the ASEAN Political-Security Community and ASEAN Socio-Cultural Community.

² Basic education comprises primary education and lower secondary education (first and second stages of education) (<http://uis.unesco.org/en/glossary-term/basic-education>).

COVID-19 has exacerbated this divide. The pandemic resulted in school closures in ASEAN countries for a prolonged period of time, resulting in learning losses for students. ADB (2021) estimates that students in Southeast Asia have lost, on average, more than 35% of a year of learning,³ more than a loss of 29% for developing Asia. Learning losses vary across the ASEAN countries, depending on the duration of school closures and uneven access to digital devices among the population. As learning losses will reduce future productivity and earnings, estimates show a loss of around \$180 or a 2.4% decline in expected annual earnings for students affected by school closures in developing Asia (ADB 2021a).

Although the school closures led to a transformation from traditional classroom teaching to a virtual one, there are no estimates yet on how far this shift has managed to mitigate the learning losses. Much depends on the readiness of e-learning methods, including e-books, IT tools, and other study materials. In many cases, e-learning presented new challenges, as both students and teachers struggled with access to digital infrastructure and devices, as well as knowledge of technical skills.

This paper discusses the state of the education divide in ASEAN and measures the importance of education quality to economic development; it provides policy recommendations drawn from the analysis and building on regional documents and studies. The past literature has looked into a range of studies to present the importance of education to human capital, innovation, and economic growth. Much discussion on ASEAN education has been restricted to higher and technical education. This paper fills this gap in the research by delving deeper into the ASEAN education divide and assesses its role with other sectors of the economy leading to economic integration.

The remainder of the paper is organized as follows. Following the introduction, Section 2 presents the literature review of the role of the education sector in economic growth and development. Section 3 elaborates on the education divide in ASEAN using selected indicators divided into three categories (quantity, quality, and output). It also shows the differences in duration of school closures and learning losses during COVID-19. Section 4 undertakes a simulation exercise to measure the potential impact of closing the education divide in ASEAN. It discusses the impact of the education sector on other sectors of these economies to understand the implications. Section 5 reviews the current regional cooperation document in the education sector in ASEAN and presents the case of education cooperation in the European Union. Policy lessons are drawn in Section 6 to conclude the paper.

2. LITERATURE REVIEW

The literature review covers three aspects: a) education and human capital; b) education and trade, investment and technology; and c) ICT-improved access to education. Education has a robust relationship with building human capital that is of inherent value. There is a direct correlation between educated people and higher productivity. Education generates higher skilled people who increase absorption capacity of technology from more developed to less developed economies. Education is also useful for providing positive social outcomes (Barroa and Lee 2013). There is also evidence of a strong association between higher cognitive skills and economic

³ This is derived from a relatively new indicator called Learning Average Years of Schooling (LAYS), which captures both quantity and quality of education. For a student, this is measured as the number of years of schooling by age 18, adjusted by the country's average student achievement. In general, for developing Asia, a LAYS that captures quality of education is lower than the quantity, i.e., average years of schooling, in a country (ADB 2021a).

growth (Hanushek and Woessmann 2008). It is estimated that one additional year of school education generates a rate of return of about 5%–8% per year for an individual (Patrinos 2016).

Education enables countries to improve comparative advantage in new product categories. In fact, quality primary education has a strong correlation with countries' development of their comparative advantage in related products that they are already producing (Felipe et al. 2021). It is also a core determinant for countries following an FDI-led growth strategy (Brooks et al. 2010). Because an adequate education system is reflected in better human capital (Hanushek and Dennis 2000), foreign investors are often attracted by the quality and relevance of education that matches their industry requirements in developing countries. Attainment of adequate education—with better quality human resources—is essential for the adoption and diffusion of technology and the resulting increases in productivity (Kim and Terada-Haglwara 2010). This is observed for both developed and developing countries: Asian economies that grew quickly acquired well-educated human resources.

Education affects the nature and growth of exports. The level and quality of education in a country's workforce (especially in developing countries) influences the nature of its factor endowments and, as a result, the composition its trade (Ozturk 2001). According to Grossman and Helpman (1989), knowledge accumulation and trade go hand in hand, as one enhances the other, especially through imports (Ben-David and Loewy 1995). The quality of education appears in differences in countries' growth trajectory. Using a dataset of 62 countries over 10-year intervals from 1960 to 2000, Jamison et al. (2007) concluded that quality of education has a positive effect on economic growth. They used the two variables to assess education quality—mathematics test scores (EQTEST) and US labor market returns to education by country of immigrant origin (EQBT)—and concluded that even a 1 standard deviation rise in test scores led to an increase in per capita GDP growth by 0.5–0.9 percentage points.

There are also studies showing that improved basic education enables individuals to be more aware of innovation at an early stage of development, and they are more capable of managing new technologies for better economic outcome. For example, Foster and Rosenzweig (1996) have shown empirically that access to basic education increased farmers' capabilities of moving from traditional to new techniques of farming and further to non-farming activities.

The COVID-19 pandemic has had a significant impact on education. Governments around the world put a stop to face-to-face teaching and moved to online learning methods. This implies lost opportunities for students to learn crucial social, cognitive, and emotional skills, along with the chance that they may forget from what they have learnt in the past (Cooper et al. 1996). As learning at young age has implication for students' ability to acquire advanced skills in the future, missed learning opportunities are likely to put the skill attainment level at risk going into the future (Meyers and Thomasson 2017). Schools in many countries have pivoted to digital classroom, but the benefits from such shifts depend on internet availability and accessibility among the general population. A cross-country empirical analysis of 117 economies—a mix of emerging and advanced economies—shows that greater internet access does mitigate some of the damage inflicted by the COVID-19 pandemic, and it further stipulates that improved internet access is likely to mitigate some of the economic loss due to the pandemic. Estimates show that improving internet access per population from the average for an emerging market (52.9%) to that of an advanced economy (87.8%) will help to reduce the former's growth slowdown by half (ADB 2021).

ASEAN acknowledges the importance of education in enhancing human capital in the region and has accordingly created institutions to support education cooperation (Dang 2017). These came into play simultaneously as ASEAN embarked on its initiative of ASEAN Free Trade Area (AFTA), and later the ASEAN Economic Community, to enhance economic competitiveness. However, much attention is paid to ASEAN higher education and vocational training, marginalizing discussion of the role of basic education in higher level learning and skills acquisition. Individual ASEAN countries also recognize the role of education in driving economic growth. While all countries have plans to improve their education system and quality, educational quality differs and remains uneven across ASEAN countries (Maneejuk and Yamaka 2021).

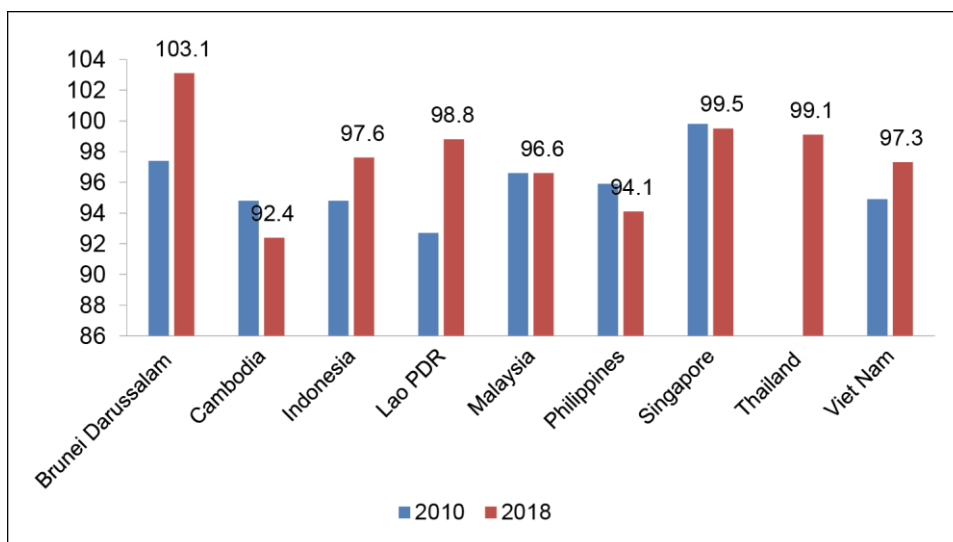
3. STATE OF EDUCATION AND THE DIGITAL DIVIDE IN ASEAN

This section looks at the educational divide through three lenses: quantity, quality, and output. It then presents the gaps in access to education among ASEAN countries during the COVID-19 pandemic.

Quantity

Figure 1a and 1b show the net enrollment ratios in primary and secondary school education in ASEAN countries. This ratio has improved over time between 2010 and 2018 for both categories of education. In 2018, while the ratio remained relatively high for primary schools, there was wide variation for enrollment in secondary education. Other than Singapore, Malaysia, and Viet Nam, the enrollment ratio is below 90% for most of ASEAN members.

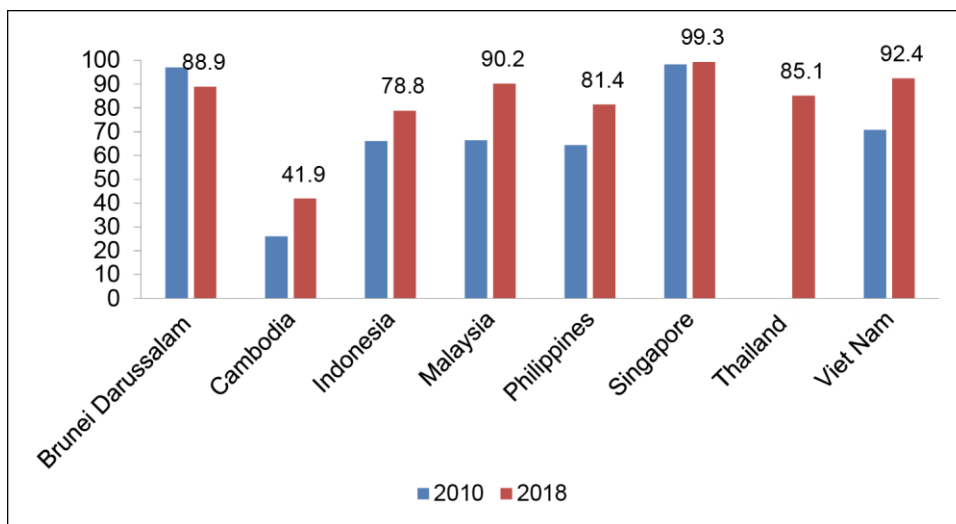
Figure 1(a): Net Enrollment Ratio in Primary School (%)



Note: Thailand data only available for 2018.

Source: ASEAN Statistical Yearbook 2020, The ASEAN Secretariat.

Figure 1(b): Net Enrollment Ratio in Secondary School (%)

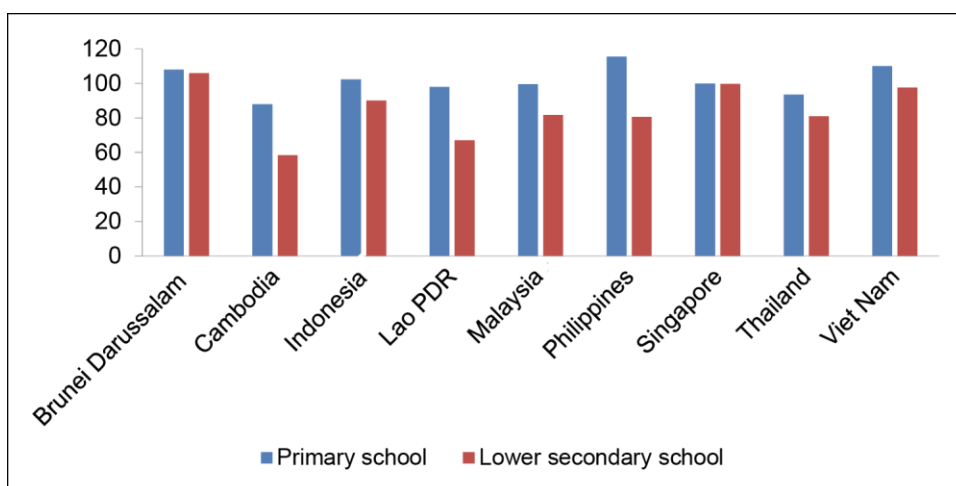


Notes: Thailand data only available for 2018; no data available for the Lao PDR.

Source: ASEAN Statistical Yearbook 2020, The ASEAN Secretariat.

Figure 2 records students’ completion rate for primary and lower secondary educational programs, which varies across ASEAN members, although the disparity is greater for lower secondary schools. With the exception of Brunei Darussalam, Singapore, and Viet Nam, the completion rate for primary and lower secondary educational programs remains low in one or both categories.

Figure 2: Completion Rate, 2018 (%) of relevant age group



Note: Figures for Malaysia’s primary school and Indonesia’s lower secondary school from 2017.

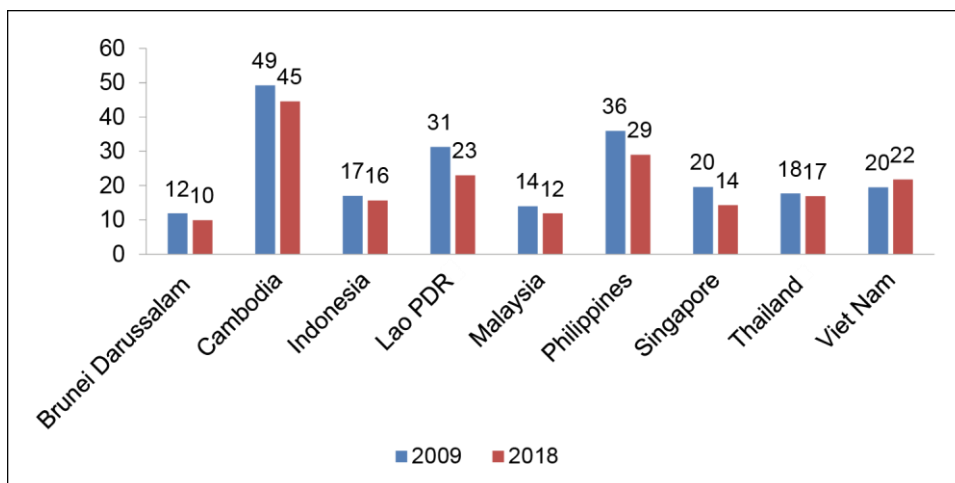
Source: World Development Indicators.

Quality

ASEAN countries face differences in quality of provision of basic education. Figure 3a and 3b show the student-teacher ratio in primary and secondary schools, which is an indicator for quality of education provision. During the period 2009–2018, while the lowest ratios were observed in Brunei Darussalam, Malaysia, and Singapore, the ratios were relatively higher and greater than 20 for Cambodia and the Philippines. A higher

ratio implies lower student access to a teacher, which in turn creates challenges for teachers to pay more attention to individual students, thus affecting student performance in the long run. The ratio of the spread of teachers over students has improved for the majority of the countries during this time.

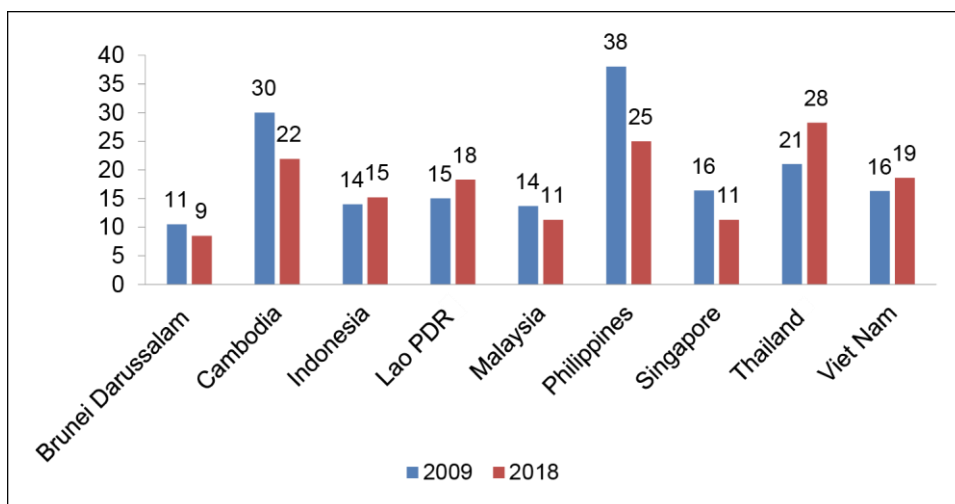
Figure 3(a): Pupil–Teacher Ratio in Primary School



Notes: Data for Thailand from 2007 and 2015; latest data for the Lao PDR is 2016.

Source: ASEAN Statistical Yearbook 2020, The ASEAN Secretariat.

Figure 3(b): Pupil–Teacher Ratio in Secondary School



Notes: Data for Thailand from 2007 and 2015; latest data for the Lao PDR is 2016.

Source: ASEAN Statistical Yearbook 2020, The ASEAN Secretariat.

With regard to school infrastructure, apart from Singapore and Brunei Darussalam, most ASEAN countries face shortages in school infrastructure. The lack of infrastructure is especially noticeable in less developed ASEAN members (Tullao et al. 2016). Table 1 shows that a sizeable proportion of primary schools in Indonesia, the Philippines, and Viet Nam do not have access to round-the-clock electricity. There is also a gap among the countries, in terms of access to computer for educational purposes or even basic sanitation facilities.

Table 1: Selected School Infrastructure Indicators in ASEAN Countries
(%)

	Electricity (2018)	Computers for Pedagogical Purposes	Single-sex Basic Sanitation Facilities
Brunei Darussalam	100	97	100
Cambodia	—	—	68.7
Indonesia	93.6	41.1	51.6
Lao PDR	—	—	76.1
Malaysia*	100	81.7	100
Philippines	94.9	77.9	—
Singapore	100	100	100
Thailand	—	—	—
Viet Nam	93	79.1	—

— = data not available.

Figures for Malaysia from 2017.

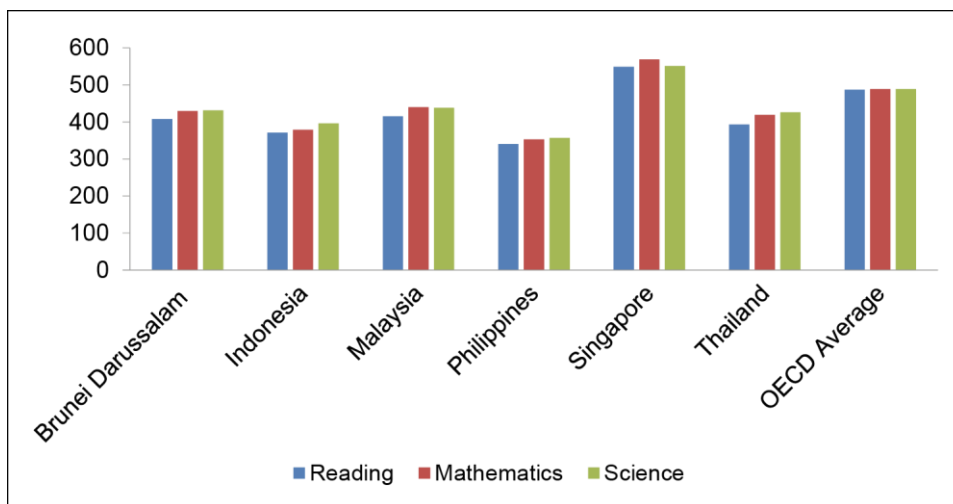
Source: ASEAN Stats, ASEAN Secretariat.

Use of ICT to enhance delivery of education services has been made mandatory in many of the ASEAN countries. However, implementation has remained patchy in most countries due to lack of resources. Tullao et al. (2015) enumerate the differences in application of ICT in education systems in ASEAN countries. While Cambodia has made it compulsory to use ICT in education service delivery by putting it in its constitution, countries like Malaysia, Singapore, and the Lao PDR have assigned a separate department within their education ministry the task to implement various technologies in public schools. The Philippines has mandated use of ICT in all learning areas. Despite these initiatives, implementation remains incomplete. All ASEAN countries have yet to ensure equal access to telecom, electricity, and internet. There is also a lack of budgetary resources provided to this particular part of education delivery. However, Malaysia, and Singapore are relatively advanced in deploying ICT in their education sector. According to the UNDP Human Development Indicator dashboard for 2020, around 97% of primary and 96% of secondary schools in Malaysia have access to the internet, which should be compared to the 61% for secondary school in Indonesia.

Output

To discuss the quality of education output, three indicators are presented here: the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA), LAYS 2020, and the UNDP Human Development Report. In 2018, Singapore performed the best in terms of the PISA assessment (Figure 4), followed by Malaysia, Brunei Darussalam, and Thailand among the ASEAN countries that participated in the assessment, for all three assessed subjects (reading, mathematics, and science). Most ASEAN countries performed poorly compared to all of the countries participating in the PISA assessment in 2018. For example, in reading competency, Malaysia ranked 56th, Brunei Darussalam 59th, Thailand 66th, Indonesia 72nd, and the Philippines 77th out of 78 countries. Singapore was the top performer, ranking second for all three assessed categories.

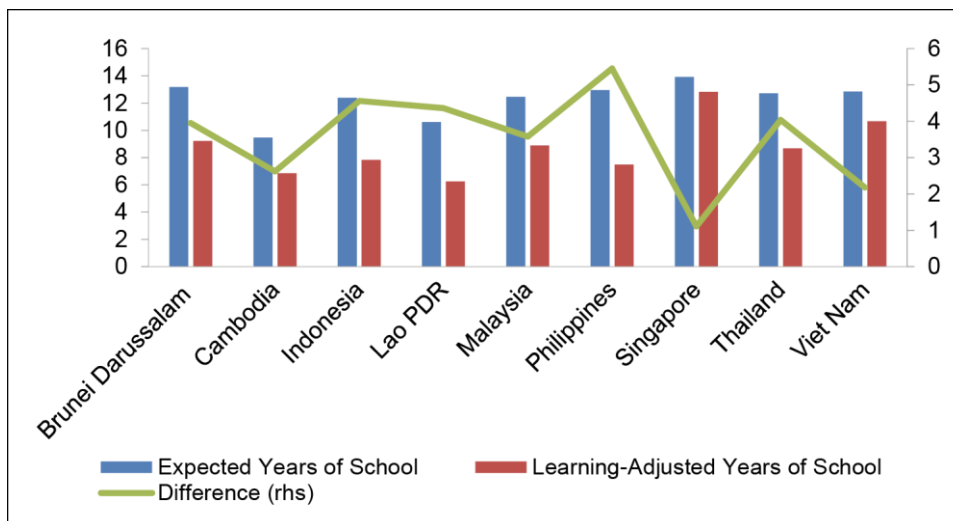
Figure 4: PISA Score 2018



Source: PISA Results 2018, OECD (PISA-results_ENGLISH.png [1181x2550] [oecd.org]).

Figure 5 illustrates how LAYS, which captures both quantity and quality of education, differs among ASEAN countries. As the indicators around quantity are relatively high, the differences in quality parameters define the extent of variation between expected years in schooling and learning-adjusted years in school. The biggest difference appears for the Philippines and the smallest difference appears with Singapore.

Figure 5: Average and Learning-adjusted Years of Schooling, 2020



Source: World Bank. Human Capital Index, 2020.

Similar differences can be observed in the Human Development Indicators—Education Index. The newer members of ASEAN, namely the Lao PDR, Cambodia, and Viet Nam, lag behind Singapore and Malaysia. This is also reflected in the percentage increase in index required to attain the Singapore level being higher for the lagging countries.

Table 2: Education Index for the ASEAN Member Countries, 2019

Rank Out of 189 (2019)	HDI (Value)	Education Index	% Increase Needed to Attain Singapore's Level
	2019	2019	
Brunei Darussalam (47)	0.838	0.702	16.82%
Cambodia (144)	0.594	0.484	42.65%
Indonesia (107)	0.718	0.65	22.99%
Lao PDR (137)	0.613	0.481	43.01%
Malaysia (62)	0.810	0.726	13.98%
Philippines (107)	0.718	0.678	19.67%
Singapore (11)	0.938	0.844	0%
Thailand (79)	0.772	0.682	19.19%
Viet Nam (117)	0.704	0.63	25.36%

Source: UNDP Human Development Indicators (hdr2020.pdf [undp.org]).

COVID-19 and the Education Divide

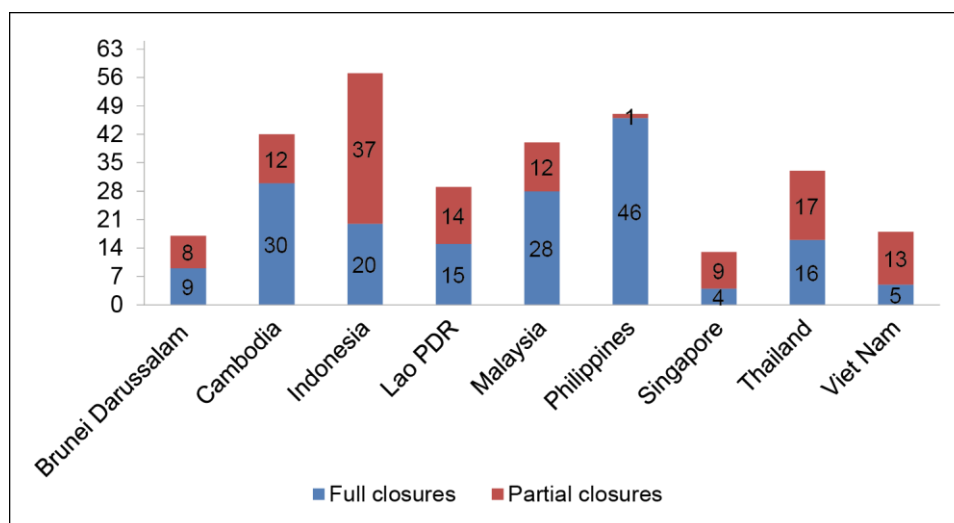
While the differences in education indicators existed prior to the COVID-19 pandemic, these were further aggravated in 2020 and beyond as the pandemic forced governments to make people adhere to lockdowns, isolation, social distancing, and cessation of daily activities to limit the spread of the virus. Education was affected by these measures, as countries went into government-directed school closure. According to the Human Development Report (2020), the school closure affected around 90% of children globally. While some could afford to learn remotely through the internet, others suffered complete loss of formal education in 2020. It is estimated that, during the peak of COVID-19, while the short-term out-of-school rate in primary education was 20% for countries with high human development, this indicator was 86% in low human development countries. The shock to the education sector will result in long-term loss in students' learning capabilities that will have implications throughout adult life, including loss in earnings. The same learning shock was felt across ASEAN countries. Schools were closed either fully or partially (i.e., in some parts of the country and/or for selected grades). During March 2020–June 2021, while government-directed school closure was longest for the Philippines (47 weeks), it was shortest for Singapore (13 weeks), Brunei Darussalam (17 weeks), and Viet Nam (18 weeks) (Figure 6). Singapore and Viet Nam implemented partial school closure rather than full closure.

Remote learning became a way to mitigate some of the adverse effects of school closures. A survey done by the UNESCO⁴ in collaboration with UNICEF, the World Bank, and the OECD highlighted that ASEAN countries predominantly used online platforms (similar to Google Meet, Zoom, and other websites) and television as modes for education. The Lao PDR and the Philippines also used radio as medium for instruction. Paper-based learning modules or worksheets were also distributed in most countries where students do not have access to television or the internet. ADB (2021a) estimates shows that school closures during the pandemic resulted in greater loss of LAYS in all scenarios (best, intermediate, and worst) based on assumption of level of effectiveness of remote learning compared to physical learning in developing countries. While it is estimated that in 2020, Southeast Asia had an average of 8.34 LAYS, the school closures during the pandemic resulted in the greater loss of an estimated 35% of a LAYS in the intermediate scenario, 27% in the best scenario, and 45% in the worst scenario. These are higher than the average for developing countries in Asia, where

⁴ UNESCO, Survey on National Education Responses to COVID-19 School Closures (tcg.uis.unesco.org/survey-education-covid-school-closures/; accessed on 14 November 2021)

the estimated loss of a LAYS is 23%, 29% and 38% in the best, intermediate, and worst-case scenarios, respectively.

Figure 6: Number of Weeks Schools Partially or Fully Closed, Till 30 June 2021



Source: UNESCO COVID-19 Response. <https://en.unesco.org/covid19/educationresponse> (accessed 24 August 2021).

Table 3 shows the variation in learning losses among ASEAN countries for all three scenarios. Looking at the intermediate scenario, the highest losses are observed for Malaysia, the Philippines, and Cambodia, which also faced relative longer periods of full school closure during the pandemic. These differences also reflect the extent of these countries' readiness in terms of distance learning, as the decision to close schools for almost all of these countries was quick, with little time for preparation among teachers or household members (ADB 2021a).

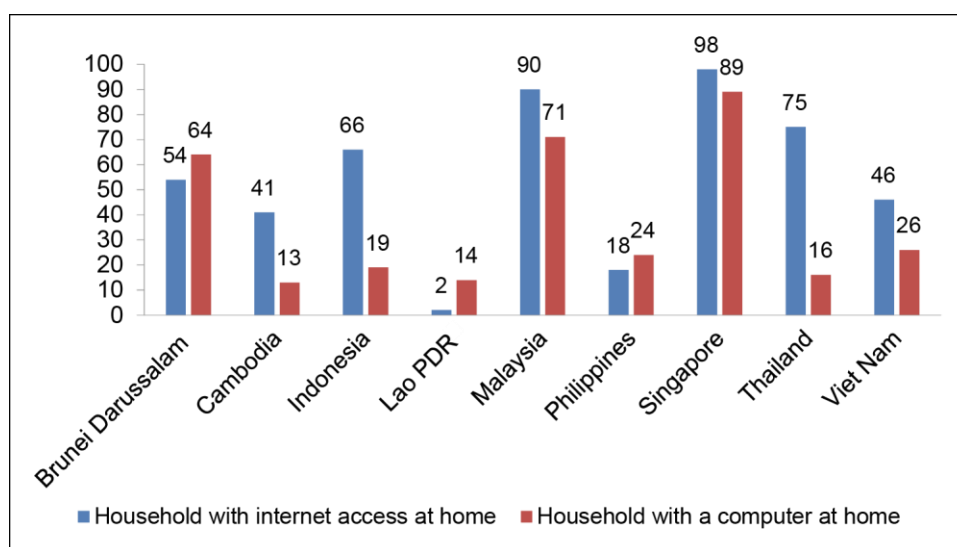
Table 3: Learning Losses

	Average Loss in LAYS			Baseline
	Optimistic	Intermediate	Pessimistic	LAYS 2020
Brunei Darussalam	0.05	0.15	0.27	9.22
Cambodia	0.37	0.42	0.50	6.84
Indonesia	0.22	0.33	0.48	7.83
Lao PDR	0.18	0.21	0.25	6.25
Malaysia	0.45	0.67	0.95	8.89
Philippines	0.53	0.61	0.72	7.49
Singapore	0.04	0.10	0.18	12.81
Thailand	0.15	0.22	0.31	8.68
Viet Nam	0.17	0.20	0.23	10.68
Southeast Asia	0.27	0.35	0.45	8.34

Source: ADB (2021a).

Access to online learning also depends on households' access to ICT infrastructure and tools. ASEAN countries considerably differ in terms of proportion of households with access to the internet, computers, and mobile devices (Figure 7). This has great importance for efficient remote learning during school closures. While 90% or more of households in Singapore and Malaysia have access to the internet, this falls to below 50% for Cambodia, the Lao PDR, the Philippines, and Viet Nam. The gap is stark, as in case of households owning a computer. Ownership of mobile phones is relatively better, as more than 75% of individuals in Brunei Darussalam, Malaysia, the Philippines, Singapore, and Thailand own a handset.

Figure 7: Percent of Households with Access to Digital Means, 2019



Note: Data for the Lao PDR pertain to 2017.

Source: International Telecommunication Union, Country ICT Data, Digital Development Dashboard (Digital Development [itu.int]).

Kizilcec and Halawa (2015) have argued that attrition rates in online education are generally higher than in classroom learning. They found that online learners from developing countries tend to have lower scores on tests compared to learners from advanced countries. The COVID-19 pandemic must therefore have led to higher attrition rates among students in less developed countries compared to more advanced ones. This will not only translate into loss of labor productivity and economic competitiveness among ASEAN member countries, but also to a loss in earnings over time.

4. MEASURING THE POTENTIAL IMPACT OF THE EDUCATION DIVIDE IN ASEAN

This section looks at education as a sector and its impact on other sectors of the economy; it is divided into two parts, which focus on the methodology and findings, respectively.

Methodology

This paper attempts to measure the potential impacts of education quality in ASEAN countries on economic growth and development based on a widely used global multi-country, multi-sector Computable General Equilibrium model and dataset called GTAP (Global Trade Analysis Project). The important advantage of this dataset is its macro-sectoral level information on education and its forward and backward linkages with other sectors, as well as multiple countries. The analysis measures quality of education using the 2019 Education index from the UN Human Development Report.⁵ ICT is inherent in the quality of education index. The methodology deployed gives a one-time education productivity shock to laggard countries to reach the level of Singapore (based on the 2019 Education Index from the UN Human Development Report shown in Table 2). The analysis in this paper assumes there is a linear correlation between quality of education and its productivity. The simulations are comparatively static in nature and do not take into account the dynamic nature of the trickle-down impact of educational quality into labor productivity over time.

GTAP Model and Database

Computable General Equilibrium (CGE) models have been widely used by the global research community to answer pressing policy questions. The CGE model is a framework in which the linkages between various sectors and the allocation of endowments/resources (such as land, labor, and capital) are captured. This framework accounts for the fact that resources are fixed in the economy while sectors can expand and contract, depending on how much their production is needed by other sectors and by final consumers. For each sector, a typical CGE dataset comprises the inputs needed for production in terms of factors as well as materials used from production of other sectors, imports, and details of where the output goes: domestic or exports. What happens in one sector has the potential to affect the whole economy, not only through its own share in the economy, but also through its forward and backward linkages with other sectors. In other words, education may be a small sector vis-à-vis the size of the economy, but if we account for its linkages with other sectors in the economy, it can be very significant. GTAP data has a reference year of 2014, so our first step was to update it to the year 2019 using macroeconomic data available from the World Bank on GDP, consumption, investment, government, exports, and imports, and using the GTAPAdjust entropy optimization procedure.

Findings

Table 4 shows the positive contribution of education quality (improved human resource) to output growth and international trade (exports and imports). Countries may lose or gain in terms of exports or imports depending on the extent of the expansion of domestic production and consumption. For example, if there is excessive domestic demand, exports may fall, and imports may rise; therefore, neither of these are a symptom of negative development, because GDP and economic welfare increase in all cases. All ASEAN countries have seen an increase in GDP due to the quality upgrade, with the highest being the Lao PDR and the lowest being Malaysia. Most ASEAN countries have seen an increase in the volume of merchandise exports except for Brunei Darussalam, Indonesia, the Lao PDR, and Philippines, with Indonesia seeing the biggest drop by 2.75%; this comes because of excessive domestic demand for goods and services required to expand the education sector in these countries. All

⁵ This paper considered the UN-Human Development Report—Education Index and not the World Bank's Human Capital Index (HCI), as the latter combines both health and education for its index score.

countries saw an increase in the volume of merchandise imports by region, except Cambodia with a decrease of 0.11%., due to greater domestic production capacity created in some goods and services that depend on the education sector.

Table 4: Percentage and Absolute Changes Due to Rise in Education Quality

	GDP Output		Merchandise Exports		Merchandise Imports	
	% Gain	Absolute*	% Gain/Loss	Absolute*	% Gain/Loss	Absolute*
Brunei Darussalam	0.62	75.6	-0.02	-2.18	0.11	4.75
Cambodia	0.85	188.9	0.04	8.70	-0.11	-24.85
Indonesia	0.88	8,932.7	-2.75	-6,066.33	2.10	4,074.38
Lao PDR	1.22	205.5	-0.27	-13.03	0.33	26.27
Malaysia	0.46	1,453.3	0.05	122.19	0.04	82.28
Philippines	0.80	2,510.7	-0.19	-168.18	0.16	208.11
Singapore	<0.00	negligible	0.02	85.78	0.04	141.38
Thailand	0.67	3,064.4	0.00	13.94	0.08	199.66
Viet Nam	0.78	1,747.5	0.08	191.61	0.12	293.23

* in US\$ millions in 2019 prices.

Source: Authors' model simulations.

Most countries saw an increase in the output of the 'education' sector (Table 5), except for Singapore, with a marginal 0.22% decrease. The highest is Cambodia, followed by the Lao PDR and Viet Nam. The reason why this increase appeared in all countries except Singapore is because Singapore's education sector was the target toward which the model increased the productivity of other countries. Singapore thus has no relative gain in productivity compared to these other countries and faces a marginal decline in the education sector. In other words, Singapore's education sector is hardly affected, given that its productivity remains unchanged. Most ASEAN countries show a positive change in economic welfare (measured as equivalent variation), with Indonesia showing the greatest change, along with the percentage change in private consumption. As shown in Table 4, it makes sense why some of the countries face a fall in exports, due to the rise in private consumption demand, mainly because of the demand for goods and services corresponding to the uplift of the education sector, leading to greater wages for people at large, who in turn consume more.

Table 5: Education Sector Output and Economic Welfare

	Education Sector: % Gain in Output	Private Consumption: % gain	Economic Welfare Million US\$
Brunei Darussalam	24.53	0.327	70.57
Cambodia	116.82	0.550	155.52
Indonesia	22.58	0.927	9,714.43
Lao PDR	72.51	0.615	211.95
Malaysia	15.70	0.300	1,379.73
Philippines	17.07	0.571	2,517.38
Singapore	—	0.007	18.12
Thailand	21.98	0.380	2,979.90
Viet Nam	29.20	0.670	1,666.93

Source: Authors' model simulations.

As this is a static simulation exercise, the results should be interpreted as the impact of improved quality and productivity of the education sector on economic growth, trade, quantity of education supplied, and economic welfare, which in turn have ripple effects on the sectors with forward and backward linkages. In all countries, utility and construction, transport, and communication increase because of their strong complementarities with the education sector. In all countries except Brunei Darussalam, all of the agricultural and food sectors and other services sectors also gain, for the same reason. There are mixed results in other sectors across countries. When a sector declines, it means that there is competition for factor endowments between the losing sectors and the education sector, resulting in a movement of factors from these sectors into the education sector. Such diversions are particularly observed in sectors like textiles and heavy manufacturing. Table 6 presents the impact on other sectors of the individual economies.

Table 6: Percent Changes to Output in Other Sectors

Sector	Brunei				
	Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia
Grain Crops	-0.05	0.02	-0.14	0.03	0.05
Meat	-0.12	0.06	0.24	0.03	0.04
Extraction	-0.10	0.07	-0.63	-0.41	-0.01
Processed Food	-0.04	0.16	-0.48	0.15	0.08
Textiles	-0.49	-1.48	-1.93	-3.50	-0.14
Light Manufacturing	-0.22	-0.35	0.23	-1.46	0.08
Heavy Manufacturing	-0.17	-0.39	-0.96	-2.25	-0.07
Utility and Construction	0.53	0.64	2.75	0.11	0.15
Transport and communication	0.16	0.22	0.59	0.27	0.10
Other Services	-0.03	0.74	0.57	0.48	0.11
Sector	Philippines	Singapore	Thailand	Viet Nam	
Grain Crops	0.09	0.01	0.02	0.02	
Meat	0.28	0.08	0.05	0.34	
Extraction	0.00	0.00	-0.03	-0.01	
Processed Food	0.16	0.21	0.10	0.21	
Textiles	-0.10	-0.07	-0.23	0.05	
Light Manufacturing	0.03	0.12	0.05	-0.02	
Heavy Manufacturing	-0.28	0.08	-0.15	-0.11	
Utility and Construction	0.36	0.01	0.24	0.43	
Transport and communication	0.21	0.02	0.06	0.35	
Other Services	0.31	0.02	0.07	0.32	

Source: Authors' model simulations.

A key element in bridging the gap between high- and low-performing countries in international assessments like PISA are digital technologies. Digital platforms, especially for education, can help mitigate the inefficiencies of weak institutions and poor infrastructure, especially in developing countries. It might sound counterintuitive that governments which cannot maintain school buildings in rural areas should focus on a likely more expensive option (digital technology in education), however, the increasing rates of penetration of smartphones and other digital platforms through which students can gain access to an inclusive system of education have promise. According to the ADB (2021b) Asian Economic Integration Report, countries have also partnered with telecommunications companies to increase bandwidth in an attempt to try and reach people from disadvantaged communities who have limited access to digital platforms. This digital expansion will also aid in improving productivity (through

education or otherwise), which will further lead to growth in output as evinced by the positive changes in GDP throughout the ASEAN economies, as well as in other indicators.

5. REGIONAL COOPERATION IN EDUCATION

This section looks at the cautious approach that ASEAN and the European Union have taken toward education cooperation. While the EU is in a relatively advanced stage of education cooperation, it has taken around 50 years to reach that stage. ASEAN education cooperation has a long way to go.

ASEAN Education Cooperation

The ASEAN Charter (ASEAN Secretariat 2007) stresses the importance of human resource ‘through closer cooperation in education’.⁶ This was further elaborated in the Cha-Am Hua Hin Declaration on Strengthening Cooperation on Education to achieve an ASEAN Caring and Sharing Community (2009)⁷ that linked enhanced quality of education to improved mobility of workers to raise competitiveness of the ASEAN region in the long run. Even long before the Charter, the countries had established the South East Asian Ministers of Education Organization (SEAMEO) in 1965 to help countries with their nation-building objectives and agendas such as basic education for all, teacher training, and vocational training, among others.

The region has established new institutions, including the ASEAN Education Ministers’ Meeting (ASEM) in 2006, which was responsible for facilitating the building of the ASEAN Economic Community. Both new and old institutions have worked in tandem since then to harmonize ASEAN education—or more particularly, the higher education system—to lead ASEAN toward a knowledge-based society in the long term (ASEAN 2015). Cooperation on education (human development) resides under the ASEAN Socio-cultural pillar (*Figure 8*). ASEAN’s goal is to achieve better livelihoods for its populations through investment in education and capacity building, encouraging innovation and entrepreneurship, and integrating ICT to facilitate socio-economic development (ASEAN Secretariat 2009).

ASEAN has developed a 5-year work plan to promote education for all. It is in its third phase, having completed 2010–2015 and 2016–2020. The ASEAN Work Plan on Education (2016–2020), with the goal of achieving improved quality and access to basic education, aligns well with the UN Sustainable Development Goal 4 (SDG4), which calls for inclusive and equitable quality education for all.⁸ ASEAN priority areas for basic education include enhancing the quality and access to basic education for all and improving the quality of basic education through quality- focused interventions. The latter includes the role of online education to improve the quality of teaching and pays greater attention to higher and technical education. The latest workplan from 2021–2025 was adopted by ASEAN countries earlier in 2021.

Use of ICT and raising capacity to access digital learning have also been prioritized among the education systems. Currently, ICT initiatives in ASEAN are supported by the SEAMEO Regional Center for Innovation and Technology (INNOTECH) and the International Council for Open and Distance Education (ICDE). The activities range from massive open online courses (MOOCs) enabling students to study courses online,

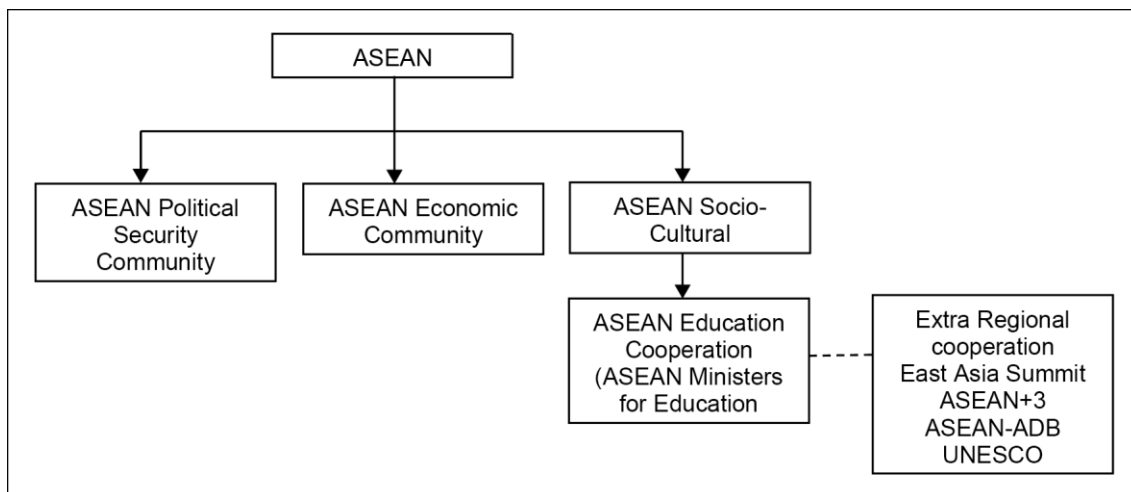
⁶ ASEAN Charter (2007) (page 4).

⁷ <https://asean.org/wp-content/uploads/images/archive/15thsummit/Declaration-Education.pdf>.

⁸ ASEAN Overview (unesco.org).

to open educational resources (OER) that provide online teaching materials in the form of filmed lectures, tapes, and videos.

Figure 8: Placing ASEAN Education Cooperation in the ASEAN Community Pillar



Source: Authors' illustration.

Most ASEAN countries have improved their education indicators. The net enrollment rates for primary schools are higher in recent years, implying that more children have access to education. Student–teacher ratios across many ASEAN members have improved, suggesting that teachers are well-spread across a smaller number of students, thus giving them more attention. However, much needs to be done in terms of improving school infrastructure and educational outcomes. While many education policies are the responsibility of national governments, cooperative measures can provide policy directions in a larger context of regional targets and aspirations. While the use of ICT in education is available at the regional level for higher studies, it needs to more rigorous implementation in primary and lower secondary education. ASEAN, as an organization, needs to promote ICT infrastructure and facilitate better accessibility to adapt to the new normal of the post-COVID-19 era.

Basic education has yet to be rigorously discussed in ASEAN documents, although it has a significant role to play in higher education. Education is currently tied up to the AEC characteristics of ‘mobility of skilled labor’, which is limited, and education has much larger implications as the ten members of ASEAN have competitive advantages in different industries or in different value chains within a particular industry. Raising education quality in the national economies will enable each of them to increase their economic competitiveness to attract foreign investment. Aggregating the individual economies will ultimately enable ASEAN to achieve its aspiration of a single market and production base in the long run. ASEAN is, however, unlikely to move toward a common approach in pursuing basic education under the ASEAN socio-cultural pillar. There are too many differences among the ASEAN countries to pursue basic education in a harmonized manner.

Evolution of EU Education Cooperation

Earlier in 2021, the EU members adopted a framework for European education cooperation 2021–2030 in accordance with the goals of creating a European Education Area by 2025. It emphasized five priority areas, including improving quality and inclusivity of the education system for all, achieving lifelong learning, motivating teachers in the education profession, strengthening higher education, and supporting green and digital transformation through education. To reach the decision to establish an education area took more than five decades. The first meeting for education cooperation among the respective ministries happened in November 1971, which later passed a resolution in 1976 and was non-binding in nature. It primarily showed the political willingness to participate in education cooperation. In the early 1980s, education cooperation was incorporated for discussion in relation to the EU's economic and social objectives. While 1992 saw education (including school education) as part of the Maastricht Treaty, the treaty remained quiet on the topic of harmonization. The European parliament became a stakeholder in education cooperation, giving it a more legal identity. Starting in 1993, as the EU implemented its single market, education cooperation entered a new phase. The evolution of education cooperation in the EU was largely driven by the rise in globalization, with increased discussion of a knowledge-based society, information society, and lifelong learning (European Commission 2006).

In the late-1990s, several countries in the EU showed their willingness for harmonization in higher education. After much deliberation, 30 European countries agreed to join the Bologna process in 1998 to achieve some form of convergence across the difference systems of higher education in the region. As EU cooperation entered into a new phase of economic, social, and environmental goals in 2000 with the Lisbon strategy, education cooperation became a core element to achieve success. A single integrated framework for policy cooperation in education came into being in 2004. The EU has developed many programs since the 1980s, including Comett, Erasmus, PETRA, Youth for Europe, Lingua, and Eurotecnet, among others.⁹ The grouping launched frameworks in Education and Training in 2010 and 2020 that provided opportunities to build on best practices in education policy and advance policy reforms at the national and regional levels. Different target measures were set to cover both quantity and quality of education, in line with objectives of life-long learning.¹⁰

In summary, one may say that it took a while for the EU to garner confidence in education cooperation. Starting from 1971, it took more than 25 years to reach the stage of harmonization; prior to that, there was political willingness, although commitments were kept broad and flexible. It was only in 2000 that the EU strengthened the connections between education cooperation and economic and social cohesion. Compared to the EU, ASEAN is a much younger organization. It has been just around 20 years since ASEAN started discussing the parameters of the ASEAN Community. While the EU's education cooperation was driven by both internal and external pressures, such as economic downturn, unemployment, globalization, and a wish to adopt concepts like lifelong learning and the knowledge economy, it is possible

⁹ Comett is a program for education in training and technology; ERASMUS is a student exchange program in the EU; the PETRA Program focuses on vocational training for young people and preparing them for their adult lives; Youth for Europe is a portal providing opportunities within the region; Lingua promotes foreign language competence; and Eurotecnet deals with self-learning competency, training the trainers, and others.

¹⁰ For example, 15% of 15-year-olds should be under-skilled in reading, mathematics and science or at least 15% of adults should participate in learning

that, for ASEAN, the impact of COVID-19 long after the pandemic years will be a turning point in education cooperation.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

To conclude, this paper discussed the education divide among ASEAN countries. The divide is largely observed in quality and output rather than in quantity. Looking at the 2019 Education Index from the UN Human Development Report, Singapore ranks the highest among ASEAN members, while others lag behind to differing extents. The COVID-19 pandemic has exacerbated this divide. With school closures and mass online education, countries seemed to have suffered learning losses that are generally higher than elsewhere in Asia. These losses undermine the objective of building the ASEAN Economic Community. Better quality education is a necessary condition for increased capability in the acquisition of skills and hence human resource development. It has a direct correlation with building economic competitiveness, which ASEAN aims to achieve to engage with the global community.

The simulation exercise, which looked at a hypothetical scenario in which all of the ASEAN member countries put in the effort and investment needed to raise the HDI—Education Index to the extent of Singapore, concluded that the productivity improvements in the education sector may have a profound short-term economic impact due to the ripple effect coming from greater consumption of goods and services related to the education sector, even when long-term labor productivity gains from improved education are not taken into account. The countries that currently have much lower educational quality, attainment, and productivity are the ones that may particularly have most to gain. GDP and economic welfare would rise for all ASEAN countries except Singapore, which would remain unchanged due to the assumption that its education sector would not witness any further improvement from its already high levels. The rise and fall of exports and imports were determined by greater economic activity—induced demand and greater expansion of domestic production and consumption patterns. Going forward, the paper provides the following policy recommendations

- Although education is the responsibility of national governments, the overarching ambition of forming an ASEAN Community should compel policymakers to set targets at the regional level to improve education quality and outputs. Measures in education cooperation should be aligned to all components of the AEC. Currently, education is tied to the AEC characteristics of ‘mobility of skilled labor’, which is limited in nature. Education cooperation should also be discussed in the Master Plan of ASEAN Connectivity that covers ICT and broadband infrastructure, which became a key for online education during the COVID-19 pandemic.
- Further policy papers should be written on the concept of lifelong learning or knowledge-based manufacturing, which are already mentioned in the AEC Blueprint. Corresponding targets should be set for national economies to achieve success in these emerging concepts.
- Regional cooperation could explore ways to establish quality assurance systems for all levels of education, including through the ASEAN Quality Assurance Network (AQAN) and the ASEAN Quality Assurance Framework (AQAF).

- Basic education has yet to be rigorously discussed in ASEAN documents, where the focus has been on basic education for all, while more discussion is needed on quality convergence among the countries.
- ASEAN should promote exchange programs among students at all levels. In the post-pandemic period, a blended approach of online and physical exchanges could be explored to encourage balanced mobility.
- While movement of teaching professionals may not be desirable at this juncture, networking events and exchange programs should be encouraged among ASEAN countries for knowledge sharing and peer-to-peer learning.

The use of ICT is possible at the regional level for higher studies, but needs to be incorporated for basic education as well. Regional cooperation should strive to improve the availability and accessibility of broadband networks and IT tools for students, teachers, and households. Use of big data should be encouraged for efficient policymaking in the post-COVID-19 era. The private sector should be engaged to work with telecom companies to gather and analyze data at the household level to understand regional needs going forward.

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