

THE ROLE OF ASEAN IN FACING THE FOURTH INDUSTRIAL REVOLUTION (CASE STUDY: EDUCATION DISPARITY BETWEEN SINGAPORE AND INDONESIA)

Wening Noor Aida Rahmawati dan Dr. Sugito, M.Si

**International Program of International Relations (IPIREL)
Universitas Muhammadiyah Yogyakarta**

Email: wening.noor.fisip18@mail.umy.ac.id, sugito@umy.ac.id

ABSTRAK

Industri 4.0 memberikan peluang dan ancaman bagi kehidupan, seperti ketimpangan pendapatan, perusakan alam, kejahatan dunia maya, dan ketergantungan internet. Ancaman juga terjadi di bidang pendidikan. Pada tahun 2019, sebuah platform media sosial bernama 'we are social' mempublikasikan data bahwa empat dari sepuluh negara anggota ASEAN termasuk dalam sepuluh besar negara yang paling banyak menggunakan media sosial. Indonesia dan Singapura merupakan negara dengan tingkat penggunaan yang cukup tinggi. Kondisi di Singapura, dengan jumlah penduduk dan luas yang relatif kecil, cenderung stabil. Berbeda dengan Singapura, Indonesia dengan jumlah penduduk yang lebih besar, lebih sulit untuk mengontrol masalah tersebut. Sehingga dapat dilihat disparitas yang terjadi antara kedua negara terutama dalam hal pendidikan. ASEAN, sebuah organisasi internasional, berupaya mengurangi kesenjangan antara Singapura dan Indonesia melalui integrasi bersama antara negara-negara anggotanya. Dalam tulisan ini, penulis menjelaskan tentang peran ASEAN dalam menghadapi disparitas di kawasan, khususnya mengenai kesiapan industri 4.0 dari segi pendidikan. Penulis menggunakan teori organisasi internasional dan konsep indeks pembangunan manusia untuk menganalisis studi kasus.

Kata kunci: ASEAN, pendidikan, industri 4.0, PISA

ABSTRACT

Industry 4.0 provides opportunities and threats to life, such as income inequality, natural destruction, cybercrime, and internet dependence. Threats also occur in the field of education. In 2019, a social media platform called 'we are social' published data that four out of ten ASEAN member countries are among the top ten countries that use social media the most. Indonesia and Singapore are countries with a fairly high level of usage. Conditions in Singapore, with a relatively small population and area, tend to be stable. In contrast to Singapore, Indonesia with a larger population, it is more difficult to control the problem. So it can be seen the disparity that occurs between the two countries, especially in terms of education. ASEAN, an international organization, seeks to reduce the gap between Singapore and Indonesia through joint integration between its member countries. In this paper, the author explains about the role of ASEAN in dealing with disparities in the region, especially regarding the readiness of industry 4.0 in terms of the education aspect. The author uses international organization theory and the concept of human development index to analyze the case study.

Keywords: ASEAN, education, industry 4.0, PISA

INTRODUCTION

Nowadays, technology is developing rapidly. Digitalization as a product of Industry 4.0 impacts changes in the education system and science development. It results in the ease of obtaining information globally. Digitalization can also change the concept of learning conceptualized in the classroom to be more flexible.

The use of technology in the era of industry 4.0 provides opportunities for convenience and raises threats. Income inequality, nature destruction, cybercrime, and dependence on technology are severe threats to life. Dependence on technology tools in society, generally only used for unuseful things, such as internet addiction, is one of the polemics arising from digitalization. The effects of Internet Addiction on educational aspects can include students becoming poor grades or being placed on academic probation because they spend too much time using the Internet than studying. In addition, Internet addiction also causes changes in student life patterns such as failure to manage time, skipping sleep, and skipping meals (Ellis et al., 2014). Even if internet addiction is increasing it will lead to Internet Addiction Disorder (Cash et al., 2012).

Data from research by Hootsuite (we are social)—a social media platform, in mid-2019 concluded that the average person spends six hours a day using the internet. It is in line with the increase in internet penetration in the world, reaching 8.9%. Simultaneously, the use of social media increased by 10.9% between 2019-2020. Of the three data, the percentage of adolescents accounted for nearly 50% of the research object. This shows another digital transformation perspective, namely the threat of internet addiction in adolescents as an important subject in education (Kemp, 2019). While we ensure that education is one of the basic aspects of the absorption of industry 4.0.

In the Southeast Asia Region, cases related to internet addiction are quite an issue that attracts attention. According to the *'we are social'* research, four out of ten ASEAN member countries are ranked in the top 10 countries with the highest levels of internet addiction in the world. The first is the Philippines, with the longest internet usage rate of 602 minutes per day. Thailand followed suit with an internet usage rate of 551 minutes per day. Meanwhile, Indonesia has an internet usage rate of 516 minutes per day. Lastly is Malaysia, with an internet usage rate of 485 minutes per day.

Following closely, as one of the developed countries in the Southeast Asia region, Singapore has an internet usage rate of up to 422 minutes per day. Even so, Singapore can control this problem; thus, not significantly impacting the education field. It is in line with the quality of education in Singapore, which is likely to be good. As evidence, the Singapore Program for International Student Assessment (PISA) score is above the average score. In contrast, Indonesia's PISA score is quite far behind (OECD, 2018). PISA is an international assessment of the skills and knowledge of 15 year olds initiated by the Organization for

Economic Co-operation and Development (OECD). PISA assesses student performance on 'real life' tasks deemed relevant for effective participation in adult society and for lifelong learning (Educational Research Centre, n.d.). Indonesia as a country with a large population and a high level of regional development inequality, faces difficulties in managing education, such as unequal access to education in all country corners. Several countries such as Cambodia, Laos, Myanmar, Vietnam (CLMV), the four newest countries to join ASEAN, have experienced the same problem. Most of them are developing countries with average economic growth at the lowest level in Southeast Asia.

The disparity between member countries has triggered ASEAN to establish several policies and joint actions to reaffirm its role as an international institution in dealing with Industry 4.0. This is so that member countries can prepare for Industry 4.0 based on their respective abilities without forgetting their relationship. This follows one of ASEAN's visions, namely accelerating economic growth, social progress, and cultural development in the region. However, the policies initiated are not enough for ASEAN to assert itself in facing the challenges of Industry 4.0 and at the same time exploring opportunities in the education sector. This article will discuss the role of ASEAN, in the context of international organizations, in facilitating and making policies to resolve regional disparities, especially in the case of education disparities in Indonesia and Singapore.

ANALYTICAL FRAMEWORK

The presence of Industry 4.0 creates challenges and opportunities for the global world. Concerning this issue, the author used the international organization theory and the human development index (HDI) concept. Through the theory and concept, the writer explained how far ASEAN's role, as an international organization, is in facing Industry 4.0 by analyzing the state of human resources in Singapore and Indonesia.

Theory of International Organizations

In the development of scientific advances, international organization theory has developed quite a broad scope with the emergence of various kinds of different schools of thought. Currently, there have been many schools of thought on international organization theory, some of which are liberalists, realists, and institutionalist idealists (Ali, 2011). Nevertheless, in simple terms, an international organization can be defined as a unified system born from a collective or collective agreement between international relations actors.

Liberalists argued that an international organization is formed to build constructiveness and cooperation between countries to promote global prosperity and create peace, which is a common goal (Ali, 2011).

According to Sugito (2016), an international organization is used in carrying out essential functions of a state system. It is a place for policy formation to be jointly decided and as an administrative place to produce actions.

Moreover, Harold K. Jacobson defined the functions of international organizations into five main points.

- a. As an information function that includes the collection, analysis, and exchange of data and information
- b. As a normative function where the inserted instruments do not bind but can influence
- c. As a function of making regulations more legally binding
- d. As a supervisory function for the implementation of regulations
- e. As an operational function, namely the operation of organizational resources (Sugito, 2016).

In another opinion, Karns Mingst (2015) described the functions carried out by international organizations at the international, state, and individual levels. International organizations function to facilitate cooperation between countries at the international level, provide information and supervision, help resolve conflicts, coordinate the handling of common problems, and build international regimes. At the state level, they function as instruments and legitimacy for foreign policy, providing information and limiting the actions of a country. Finally, regarding the function toward individuals, international organizations provide space for individuals to socialize and obtain information on the international order (Karns et al., 2015:67).

Nicolas Burmester (2019) on her thesis mention three different concepts of international organization :

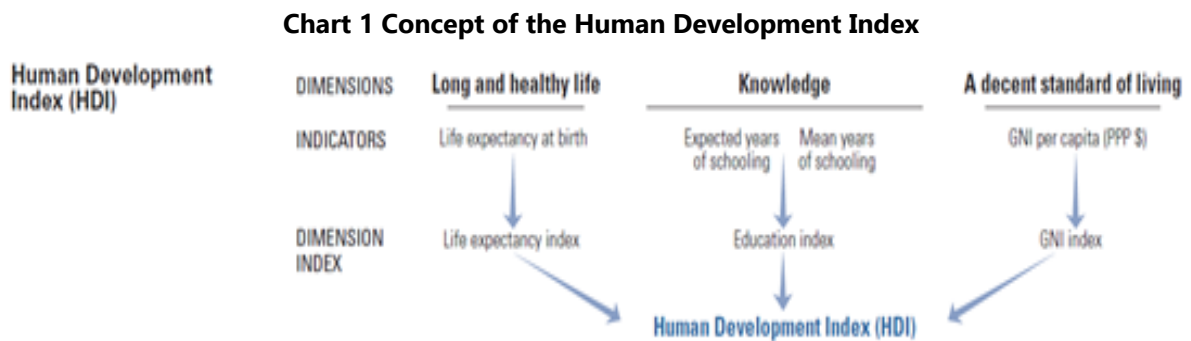
- a. As an instrument
International organizations become a means of carrying out a political process for their member countries to achieve national interests.
- b. As an arena
International organizations become an arena for interaction between member countries to carry out integration to formulate a common policy.
- c. As an actor

International organizations can become corporations for member countries due to the agreement to hand over part of their sovereignty (Burmester, 2019, pp. 11-12)

In this paper, international organization theory was applied to analyze how ASEAN as an international organization plays a role in dealing with the era of Industry 4.0, especially in education, using an approach to international organizations' functions for member countries.

Concept of the Human Development Index

The Human Development Index is an overview of achievement standards in the three main dimensions of human development: health, education, and standard of living. The health dimension includes Life Expectancy, and the education dimension covers Expected Years of Schooling and Mean Years of Schooling, while the Standard of Living dimension encompasses Gross National Income per Capita.



Source: Human Development Index (HDI) | Human Development Reports (undp.org), accessed on April 4, 2021

The minimum value on the Life Expectancy Indicator is based on research that in the 20th century, no country has a life expectancy of fewer than 20 years. On the other hand, the maximum value is obtained from the reality of the last 30 years that living conditions have continued to improve along with medical developments. Meanwhile, the minimum value on the education dimension index is obtained because people can normally live without formal education, resulting in the justified minimum number of zero years. The maximum number, 18 years, is obtained from the maximum average Master's degree in some countries.

The calculation of the low minimum value of Gross National Income per Capita is derived from the fact that sizable amounts of unmeasured subsistence and non-market production in the economy are close to the unrecorded minimum. Moreover, the maximum value is based on Kahneman and Deaton's (2010) theory, showing that per capita income above USD 75,000 has almost no impact on development and welfare.

Table 1 Dimension Index

Dimension	Indicator	Minimum	Maximum
Health	Life expectancy (years)	20	85
Education	Expected years of schooling (years)	0	18
	Mean years of schooling (years)	0	15
Standard of living	Gross national income per capita (2011 PPP \$)	100	75,000

Source: (UNDP, 2020)

The Human Development Index was applied to analyze human resources in Indonesia and Singapore concerning readiness to face Industry 4.0. However, this discussion only focuses on education following the title of this paper.

RESEARCH METHOD

A descriptive method and a qualitative study approach were utilized to explain this phenomenon. The descriptive method explained the phenomenon in international relations by answering the questions of who, what, where, and when the phenomenon occurs. This method described the phenomenon in an orderly, objective, and detailed manner. The data were collected from literature studies from journals, books, articles, scientific papers, news, and information from the mass media. Meanwhile, to analyze the data, an inductionist approach focusing on the importance of a global system was employed (Mas'ood, 1990). In this case, ASEAN is an international organization playing a role at the global system level.

DISCUSSION

Impact of Industry 4.0 on Life

Living and working underwent many changes, influenced by large amounts of data to discover something new and activate the machine to do something. It leads to good economic growth, but it is inversely proportional to the availability of jobs. Industry 4.0 is marked by the emergence of Cyber-Physical Systems (CPSs), born from the development of computer algorithms, machines, and artificial intelligence (AI). Human creativity and ideas bring change; thus, the CPSs will facilitate human work where humans do not have to do everything independently. Accordingly, it will raise the possibility of humans to cooperate with robots or called "cobots" to create something impossible becomes possible (Gleason, 2018).

One of the impacts of the presence of technology is the easy way to accessing all forms of information needed in the development of the education system. The presence of devices, laptops, computers, and other devices also can support the learning process. Nowadays, due to the COVID-19 pandemic most of learning at school or university must be implemented virtually. This distance learning generally accesses the Zoom Meetings application, Google Meets, WhatsApp, and other applications.

Distance learning is the policy of the government of every country regarding the sustainability of students to study. Students can continue their learning more flexibly without the need for face to face in a room. Besides, inevitably, students and other people must be aware of technology, useful in the future following its rapid development. In the process, distance learning is not without obstacles, one of which is that many students find it difficult to access the internet, thereby causing less maximal distance learning. In another case, economic pressure, which impacts the lack of technological devices, also hinders the distance learning process.

Technological tools can also affect children's habits from an early age. Giving children the freedom to access the internet without proper supervision from parents may lead to the technology being used for less positive things, such as playing online games causing addiction and excessive social media use, making them less concerned with social life. It will definitely cause severe problems if not immediately addressed, given that children and adolescents are of the productive age for education.

Another perspective of the advancement of gadget technology for education is laziness that arises from students. The dependence on technology that makes everything depend on devices impacts the lack of readiness of students to face problems instead of looking for solutions in their ways and ideas. Hence, the arena of student productivity will decrease. Moreover, technology dependence trains students to learn to cheat, especially during examinations. It triggers students to plagiarize, write formulas and calculations in calculators and other applications. The impacts range from moral degradation to the worst situation of dropping out of education. In the HDI concept, an increase in the dropout rate will affect educational indicators, namely Expected Years of Schooling (years) and Mean Years of Schooling (years). Therefore, it will affect the quality of education in a country regarding the quality of its human resources.

ASEAN in Responding to Industry 4.0

The emergence of the first Industrial Revolution 4.0 in 2011 was sparked by a group of representatives of experts from various fields from Germany at the Hannover Trade Fair. Afterward, in 2015 Angela Merkel introduced it at the World Economic Forum (WEF). Industry 4.0 is just starting to be felt in Southeast Asia

and discussed between 2017-2018. In that year, digitization began to spread rapidly in various regions of Southeast Asia (CNBC, 2018).

ASEAN, an international institution housing countries in Southeast Asia, responds to Industry 4.0 through the ASEAN Integration Report 2019. In this document, ASEAN discusses the opportunities arising from Industry 4.0. One of them is the increase in the economy, especially in the five old member countries, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, estimated to reach 200 billion USD in 2025. Digital integration born due to Industry 4.0 is an opportunity, particularly for micro, small, and medium enterprises (UMKM) (The ASEAN Secretariat, 2019).

The document also describes the assessments recommended by the High-Level Task Force. This assessment assesses the readiness of ASEAN Member States (AMS) for Industry 4.0. The ASEAN assessment for the ten member countries adopts a method from WEFs concerning future production. The assessment of future production is divided into five dimensions, and each is described below.

1. Dimensions of Innovation and Technology. This first dimension assesses how several conducive innovations are implemented using eight indicators, including aspects for accessing information and communication technology infrastructure. The eight indicators are: (a) subscriptions to cellular phones; (b) subscription to the wired internet; (c) services to wireless internet; (d) 4G cellular network coverage; (e) internet users; (f) commitment to cybersecurity; (g) the number of scientific publications and their techniques; and (h) number of patent applications.
2. Dimensions of Human Capital. This second dimension measures the ability of a country to respond to changes in the workforce as a result of automation and advanced Industry 4.0 technology. Four indicators used in this dimension consist of (a) adult literacy rate, (b) school years, (c) migration, (d) higher education quality
3. Dimensions of Regulatory Framework. This third dimension assesses through the recognition of the potential role of the regulatory framework in creating a supportive environment for innovation. It uses an indicator of effectiveness.
4. Dimensions of Infrastructure and Connectivity. Robust connectivity and infrastructure are the basis for facilitating technology upgrade and adoption. The main focus of this dimension is the aspect of connectivity that extends beyond logistics, especially concerning digital connectivity. Therefore, this assessment uses three indicators of (a) logistic performance index, (b) network connectivity index and (c) international internet speed.
5. Dimensions of Inclusive and Sustainable Growth. This dimension assesses how a country utilizes natural resources and the environment as a consequence of production.

The five dimensions of the assessment carried out by ASEAN produce four patterns with different levels among its member countries:

1. Leading (having a strong economic base and ripe for the future): Singapore ranked first regionally, followed by Malaysia and Thailand
2. Legacy (has a strong economic base and risks in the future): Indonesia
3. High Potential (limited economy, but has a fairly good position in the future): Brunei Darussalam and the Philippines
4. Nascent (limited economy and future risks): Vietnam, Cambodia, Laos, and Myanmar

Besides, through the ASEAN Economic Community Blueprint 2025, ASEAN also discusses the Big Trends (Megatrends) regarding the Industrial Revolution's development. AEC Blueprint 2025 is an economic integration program expected to create a stronger ASEAN in responding to challenges arising from global trends. This integration ensures greater competitiveness, dynamism, and inclusiveness of ASEAN. It focuses on opportunities, challenges, and policy recommendations to advance ASEAN in the digital era to create conditions for Industry 4.0.

In its implementation, Industry 4.0 is welcomed by ASEAN as an international institution and in its several member countries. One example in Indonesia, the government is implementing the Making Indonesia 4.0 program. The program for implementing the Industry 4.0 road map in Indonesia provides a clear direction and strategy through technology research and development. There are at least ten national priorities to encourage Industry 4.0 in Indonesia:

1. Improving the flow of goods and materials
2. Redesigning industrial zones
3. Accommodating sustainability standards
4. Empowering MSMEs
5. Building a national digital infrastructure
6. Attracting foreign investment
7. Improving the quality of human resources
8. Developing an innovation ecosystem
9. Implementing incentives for technology investment
10. Performing harmonization of rules and policies

Disparities between Singapore and Indonesia in Facing Industry 4.0

The Human Development Index (HDI) concept was employed to analyze the conditions of ASEAN member countries in facing Industry 4.0 through human resources (HR). This concept summarizes the average

measure in assessing the development of a country with human quality as a factor, not only economic growth. It explains how two countries with the same per capita rate have different human quality outcomes. The benchmarks used were health, education, and a decent standard of living.

The old education system was no longer guaranteed to produce graduates ready for a career in Industry 4.0, raising a question of how preparing human resources that can be employed and responsible in the modern education system. The stand-alone education system is deemed incapable of minimizing unemployment, especially in the technological era. Liberal arts education is considered a perfect solution for creating future-ready graduates (Lewis & Rupp, 2016).

Even so, the old education system remains an important point for the development of human resources. However, for a better quality of education the old education system must be collaborate with technological elements and work with policy makers. The role of technology elements and **polycymaking** will have an impact on increasing expertise in existing human resources. Another thing that can support better human resources is to instill an open-minded attitude to accept technological developments.

Since the beginning of Independence, Singapore was executed educational reforms. The concept of "thinking schools, learn nation," initiated by the Prime Minister of Singapore, Goh Chok, made the central flow of educational reforms afterward (Saravanan, 2005). Singapore then developed the idea by creating "teach less, learn more", focusing on reflection on students. Furthermore, in the beginning of 2000, the school of excellence model (SEM) concept was started. Singapore measures the strength of schools and areas to be developed. SEM can describe a superior school where leaders direct staff, strategize, and distribute resources systematically (Sa'adah, 2020).

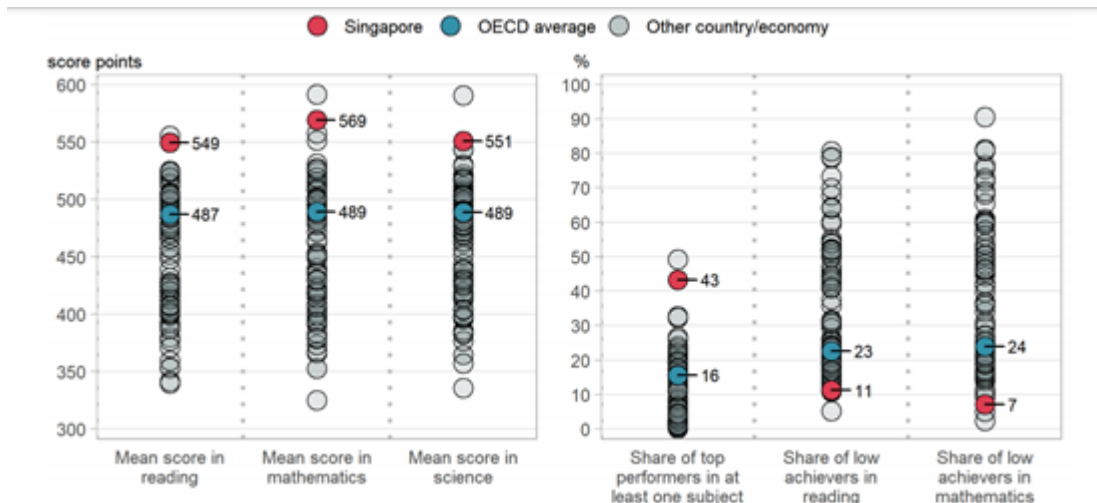
Reflecting on the successful concept of education reform in Singapore, in 2018 Singapore also issued a policy of the concept of "learning not competition". The purpose of this policy is to prevent comparisons of performance between students and ensure that student achievement is measured according to ability (World Economic Forum, 2018).

The education sector is a top priority for the Singapore government, especially during the leadership of Lee Kuan Yew. At the time of his leadership, the education level in Singapore was in the high category and has remained to this day. It corresponds to the best student test in the world. The OECD created PISA to measure the reading, math, and science literacy achievement of children under 15 years (Programme et al., 2018). In the 2018 OECD report, Singapore's PISA improved performance than the OECD average and continued to increase from year to year. The results of the PISA test average:

Top-performing students in science can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena and events. In mathematics, they are capable of

advanced mathematical thinking and reasoning. In reading, top performers can retrieve information that requires the students to locate and organize several pieces of deeply embedded information from a text or graph (OECD, 2019).

Figure 1 Comparison of PISA Singapore and OECD



Source: oecd.org, results of the OECD survey report on PISA (2018), accessed on April 4, 2021

The policies born later impacted the score of the education dimension on the Human Development Index. It can be seen from the numbers of Mean Years of Schooling and Expected Years of schooling, the majority of which have increased in each period.

Table 2 HDI (1990-2018) of Singapore

Year	Expected years of schooling	Difference	Mean years of Schooling	Difference
1990	10.6		5.8	
1995	11.6	1	7.3	1.5
2000	12.7	1.1	8.9	1.6
2005	13.9	1.2	10.5	1.6
2010	15.2	1.3	11.2	0.7
2015	16.1	0.9	11.4	0.2
2016	16.3	0.2	11.5	0.1
2017	16.3	0.2	16.3	4.8

2018	16.3	0.2	16.3	0
2019	16.3	0.2	11.5	-5
Average		0.95		1.72

Source: undrp.org, Human Development Data Center, accessed on April 4, 2021

The increasing quality of education indirectly affects the Singapore economy. The concept of a "future economy" causes Singapore to experience excellent economic development. At the age of 50, the country, with a national anthem entitled "Onward, Singapore", has succeeded in eliminating poverty. Based on human development index data as of 2018, Singapore's gross national income per capita has reached 83,793 USD, ranking third in the world. Unlike Indonesia, the gross national income per capita figure was around 11,256 USD in 2018 (actualitix.com, 2018).

An improving economy has an impact on the quality of health in Singapore. In a study conducted by the Future Health Index (2018), Singapore received the highest score in the second highest score after Australia, reaching 54.61 out of 100. The measurement of value is based on access to health care or services that can reach the population. In addition, according to the Human Development Index report as of 2018, the life expectancy in Singapore is 83.5 years. However, this does not mean that Singapore will not experience problems. Singapore is indicated that facilities will be threatened to face a shortage of workforce and health in 2030.

In the other hand, the roots of the policies that have been carried out by Singapore in improving education have an impact on the Human Development Index total score which has increased significantly.

Table 3 HDI (1990-2018) of Singapore

Tahun	HDI Value
1990	0,718
1995	0,771
2000	0,818
2005	0,869
2010	0,909
2015	0,929
2016	0,933

2017	0,934
2018	0,935

Source: undrp.org, Human Development Data Center, accessed on April 4, 2021

In contrast to Singapore, Indonesia has carried out educational reforms in three ways: the Education Decentralization Program within the school-based management framework, the Education Unit Level Curriculum (KTSP) and the 2013 Curriculum, and the Teacher Certification program (Gleason, 2018). The first program is the Decentralization of Education within the framework of school-based management, which explains the laws and regulations indicating that local-level educators and the government will manage the education system. Moreover, the Decentralization of Education has changed the responsibility of the Ministry of Education from instruction to a coordination function. The next program is the Education Unit Level Curriculum (KTSP) and the 2013 Curriculum. KTSP provides freedom for schools to develop curricula, determine vision and mission, and analyze the internal and external environment of the school (journal). This curriculum also sets 80% to accommodate national content and 20% to facilitate local curricula. The local curriculum material is determined by the ability of the human resources from the school as well as the special mission of the school. Unfortunately, the KTSP model tends to result in centralized education management (Gleason, 2018).

The next innovation implemented by the Indonesian Government is the 2013 Curriculum. This curriculum integrates various subjects previously separate. Critical and creative thinking is required from an early age to bring up a comprehensive understanding of a phenomenon. Students are invited to find their answers to various problems to gain more meaningful knowledge; it is called the inquiry learning method (Festiyed, 2015). The 2013 Curriculum changes the passive learning system to be active to allow students to get meaningful experiences. Interactive learning between student-teacher, student-community, student-environment, or other media, replaces one-way learning patterns that are only teacher-student interactions and replaces isolated learning patterns into network learning patterns. This pattern allows students to discover reference sources from anyone and anywhere to make the best use of the internet, causing the 2013 Curriculum to adapt to the times (Aji & Budiyo, 2018).

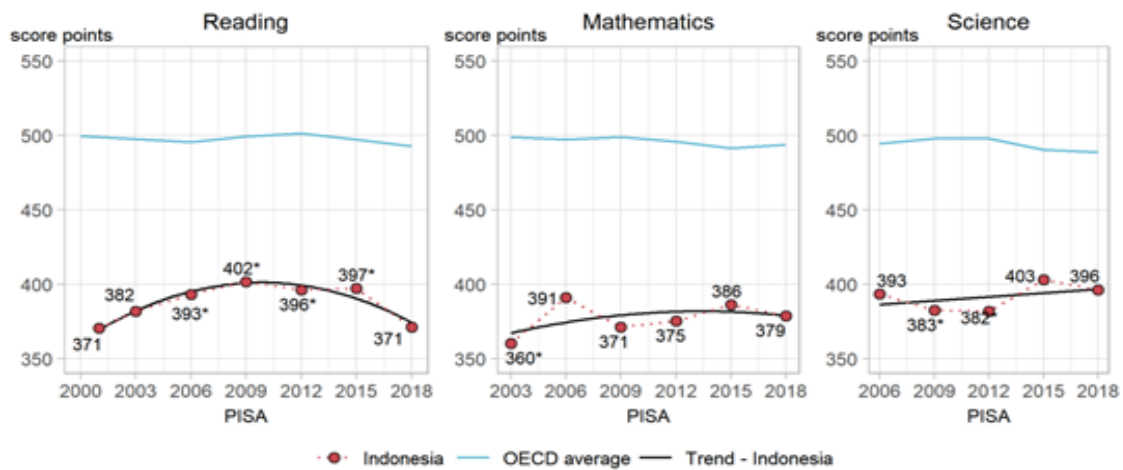
The next reform carried out by the Indonesian Government is the Teacher Certification program. Following Law No. 20 of 2003 concerning the National Education System and Law No. 14 of 2005 concerning Teachers and Lecturers, teaching staff must meet the minimum qualification standards in the form of a Bachelor's degree in the area relevant to the subject taught. Formal evidence that the teacher has reached the competency standard for teaching is a teaching certificate. Teacher competence consists of four points:

(1) pedagogical competence, (2) personal competence, (3) social competence, and (4) professional competence. The teacher certification program aims to improve teacher competence and professionalism to enhance learning and teacher performance to realize better education services (Art, 2003).

With the population growing increasingly out of control and a wider area than Singapore, education policy in Indonesia is still having difficulties on its way, evidenced by Indonesia's PISA score, which is still unstable.

Figure 2 PISA conditions in 2000-2018

Figure 2. Trends in performance in reading, mathematics and science



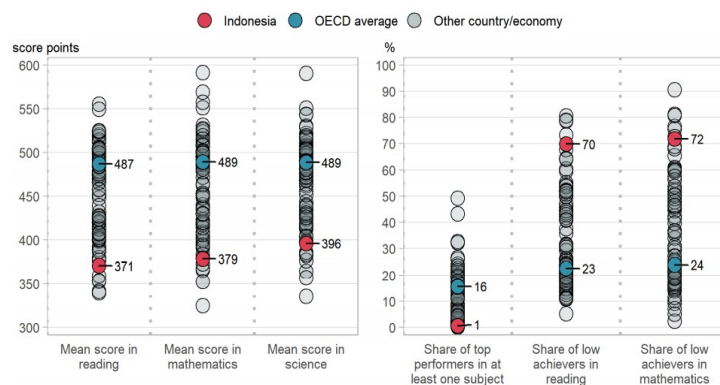
Source: oecd.org, results of the OECD survey report on PISA (2018), accessed on April 4, 2021

Besides, as of 2018, four of the six PISA assessment indicators in Indonesia have an average value below the OECD average.

Figure 3 Indonesia's PISA score position

What 15-year-old students in Indonesia know and can do

Figure 1. Snapshot of performance in reading, mathematics and science



Source: oecd.org, results of the OECD survey report on PISA (2018), accessed on April 4, 2021

Nevertheless, the Human Development Index analysis indicates that Indonesia has experienced an increase in the Expected Years of Schooling data from 1990-2019, with an average of 0.5. Besides, Mean Years of Schooling data from 1990-2019 also increased by an average of 0.8.

In the life OF expectancy assessment, Indonesia is still only at the 71,5 year age level. The presence of the Social Security Administering Body (BPJS) is expected to be able to provide solutions to life expectancy which actually makes BPJS a bigger burden of responsibility.

Table 4 HDI on Educational Dimensions

Years	Expected years of schooling	Increase	Mean years of schooling	Increase
1990	10.1		3.3	
1995	10.1	0	4.2	0.9
2000	10.6	0.5	6.7	2.5
2005	10.9	0.3	7.4	0.7
2010	12.2	1.3	7.4	0
2015	12.8	0.6	7.9	0.5
2016	12.9	0.1	8.0	0.1
2017	12.9	0.1	8.0	0
2018	12.9	0.1	8.0	0
2019	12.9	0.1	8.0	0
Average		0.56		0.78

Source: undp.org, Human Development Data Center, accessed on April 4, 2021

From the above data, a comparative analysis can be presented between Singapore and Indonesia based on the PISA score and the Human Development Index concept as follows:

**Table 5 Comparative analysis between Singapore and Indonesia
Based on PISA Score and Human Development Index**

Indicator	Singapura	Indonesia
PISA Score	As of 2018, 4 out of 6 indicators were above the OECD PISA average	As of 2018, 4 out of 6 indicators were below the OECD PISA average
Education *calculation was obtained from the average increase in HDI in each period (5 years)	The average increase in the Expected Years of Schooling data from 1990-2019 was 0.95 . The average of the Mean Years of Schooling data from 1990-2019 was 1.75 .	The average increase in the Expected Years of Schooling data from 1990-2019 was 0.5 . The average of the Mean Years of Schooling data from 1990-2019 was 0.8 .

The analysis results demonstrated a disparity between the PISA scores of Singapore and Indonesia. The Singapore level position was above the OECD average, while Indonesia's was below it. In the education indicator, the average increase in the Expected Years of Schooling data in Singapore was 0.9 greater than in Indonesia. Meanwhile, the average of the Mean Years of Schooling data from Indonesia was 0.95. In other words, there was a disparity in human resources, especially in the education sector; Indonesia was lower than Singapore.

The Role Of Asean In Facing Industry 4.0

The disparity between Singapore and Indonesia presents a gap among ASEAN member countries. In a deeper view, the gap does not only occur in Singapore and Indonesia. The four youngest member countries in ASEAN also experience relatively high disparities.

The 2010-2018 Human Development Index data describing the scope of the CLMV (Cambodia, Lao PDR, Myanmar and Viet) countries presented a significant gap. Especially when compared to other member countries. Vietnam leads among the other four new countries. In fact, seen from the results of a study on the disparities of Singapore and Indonesia, the quality of HDI is one of the influences on the readiness of a country to face Industry 4.0.

At this stage, ASEAN experiences a policy dilemma. In international organization theory, ASEAN has an operational function to manage organizational resources containing human resources (Jacobson, 2016).

Another function is conflict resolution and coordinating common problems at the international level (Mingst, 2016). ASEAN is also the place for administration to produce action. At the same time, ASEAN as an international organization also serves to limit the actions of a country.

Jacobson (2016) also stated that international organizations are a normative function with instruments included in non-binding principles. Added to this is the principle of ASEAN Non-Intervention, which makes it unable to intervene in the internal affairs of members explicitly. In this regard, ASEAN has hesitated in providing solutions to the problems.

However, ASEAN has actually focused on improving the quality of education in the Southeast Asian region in regard to face industrial revolution 4.0 in last ten years past. As the purpose of the establishment of ASEAN itself, namely to promote peace in the region and develop economic growth, social and cultural progress development. It started in 1995, ASEAN was established the ASEAN University Network (AUN) which provides a systematic mechanism to support collaboration, integration, and investment in Southeast Asia (Jamaludin et al., 2020) .

ASEAN continues to strive for the success of Narrowing Development Gaps as one of its vision and mission through normative policies. One of them is by presenting the ASEAN III Integration Work Plan Initiative 2016-2020. The strategies carried out are in the form of Food-Agriculture, Trade Facilitation, MSMEs, Education, and Health and Welfare of Creatures. The specific decision in regards of education is ASEAN promoting mutual recognition of qualifications standards between members of ASEAN. ASEAN then formed the ASEAN Integration and Narrowing Development Gap Team (The ASEAN Secretariat, 2019)

There are at least five important points generated by the ASEAN III Integration Work Plan Initiative which was implemented in 2016. It will be summarized in the table 4.

Table 4 The Key Point on Education Aspect

Objectives	Actions
1. Increase Access to basic education (Primary and lower secondary)	Carry out research and development on dropout issues through alternative approaches to improve their access to basic education, with a particular focus on the disadvantaged and marginal groups
2. Improve the quality of basic education	Develop the capacity necessary to enable participation in international testing programmes, including through training of teachers and provision of education materials

3. Improve the quality of technical and vocational education and training, and higher education	Complete the development of National Qualifications Frameworks (NQFs), and begin undertaking quality assurance activities in TVET and higher education
4. Improve English language standards	Develop programmes to train primary school teachers in English language instruction
	Develop programmes to provide English language training to government officials

Source: asean.org, Initiative for ASEAN Integration (IAI) Work Plan III, accessed on June 2, 2021

The development of this program then gave birth to the ASEAN Declaration on Industrial Transformation to Industry 4.0 as a form of preparation for facing Industry 4.0. This declaration was born after previously, ASEAN had also launched the ASEAN Vision 2025 Community and the ASEAN Economic Community (AEC), aiming to build an ASEAN community that was people-oriented, people-centered. Hence, this declaration is one of the tools to achieve this vision. The declaration passed on November 2, 2019, in Bangkok. It was agreed to increase the involvement and interaction between the ASEAN member states in dialogue/forums. There are six essential points in this declaration, namely:

1. Intensifying cooperation between member countries to explore the possibility of forming new mechanisms and open platforms to support the government, academia, and industry comprehensively toward increasing Startups, MSMEs, e-Government, Smart Cities, and Vocational Education to accelerate ASEAN's readiness toward Industry 4.0. It is followed by increased human resource development and capacity building in digitization.
2. Improving the quality and capability of skills to prepare human resources to face technology and innovation
3. Stimulating the adoption and diffusion of technological innovations such as the Internet of Things (IoT), Augmented Reality (AR), Artificial Intelligence (AI), Big data, and 3D Printing through collaborative research, investment, development activities, sharing of information and experiences in policymaking and the innovation system mechanism
4. Reaffirming the commitment to advance Industry 4.0 through a strategy emphasizing promoting innovation and technology-based industries
5. Enhancing cooperation in developing regulatory frameworks favorable for the transformation of Industry 4.0 in ASEAN by strengthening public and private dialogue to promote digital standards, facilitate cross-border data flow, and develop common platforms

6. Overcoming challenges that impede the progress of the ASEAN industry and providing solutions to those problems (ASEAN, 2019)

During its development, the points in the declaration have begun to be implemented. Several ASEAN member countries have collaborated as a form of concrete action from the declaration that has been mutually agreed upon. For example, in February 2020, a cooperation agreement between Indonesia and Singapore was signed. The agreement contains the avoidance of double taxation (tax treaty), cooperation in investment and human resource development (HR), enforcement of customs laws, cooperation in education and research and development between universities of the two countries, as well as the realization and strengthening of cooperation in training of industry 4.0 (antara news, 2020).

Previously, ASEAN began its steps by strengthening policies through the ASEAN Symposium on Human Empowerment and Development, which provided a communication space for policymakers in Southeast Asia to develop human resources in facing Industry 4.0. The symposium, which collaborated with stakeholders, was held on June 21, 2019, and resulted in the ASEAN Declaration on Human Resources Development for the Changing World of Work. Besides, it also improves responsiveness and integrates institutional frameworks (ASEAN, 2020).

ASEAN carries out its function of acting as the formation of administrative policies and facilitating cooperation between countries to find standard solutions to Industry 4.0. In this case, ASEAN does not only function at the international level but also at the state and individual levels by providing related information and cooperation with stakeholders.

CONCLUSION

Industry 4.0 provides convenience in various aspects, including education. However, this convenience must be accompanied by an increase in the quality of human resources, such as in Singapore and Indonesia. In this regard, ASEAN's role is urgently needed to overcome disparities in its member countries in order to reduce these gaps. ASEAN as an international organization has maximized its role through policies including: Policy to Narrow the Development Gap by presenting the ASEAN III Integration Work Plan Initiative 2016-2020, ASEAN Declaration on Industrial Transformation to Industry 4.0 as a form of preparation for Industry 4.0 itself, and the ASEAN Symposium on Human Empowerment and Development which provides a communication space for policy makers in Southeast Asia to develop human resources in facing Industry 4.0

In carrying out its duties as an international organization, ASEAN also facilitates its member countries in building cooperation to face industry 4.0. in 2019, there was an agreement between Indonesia

and Singapore regarding industry 4.0. The cooperation that exists is in the field of education, namely research and development between universities of the two countries, as well as the realization and strengthening of cooperation in the field of industrial 4.0 training.

Basically, the substance of the policies created by ASEAN so far has only been normative. Considering the basic principle of establishing ASEAN is Non-Intervention, it makes it difficult for ASEAN to be directly involved in overcoming disparities among its member countries. Thus, in the context of ASEAN's success in dealing with disparities between its members, it is only a facilitator who bridges the interests of member countries.

REFERENCES

- antara news. (2020, January 28). indonesia-singapore-cooperate-to-improve-industrial-competitiveness. Diambil kembali dari en.antaranews.com: <https://en.antaranews.com/news/140399/indonesia-singapore-cooperate-to-improve-industrial-competitiveness>
- Burmester, N. (2019). International Organizations as Actors and Arenas in International Politics. *The Journal Politica*, 11-12.
- CNBC. (2018, January 24). DAVOS WEF. Diambil kembali dari cnbc.com: <https://www.cnbc.com/2018/01/24/germanys-needs-to-modernize-and-embrace-digitization-merkel-says.html>
- Educational Research Centre. (t.thn.). www.erc.ie. Diambil kembali dari Studies: <https://www.erc.ie/studies/pisa/what-is-pisa/#:~:text=PISA%20is%20a%20project%20of%20the%20Organisation%20for,2000%2C%20PISA%20has%20been%20implemented%20every%20three%20years.>
- Kemp, S. (2019, October 23). we are social. Diambil kembali dari Digital 2019 Q4 Global Digital Statshot: <https://wearesocial.com/blog/2019/10/the-global-state-of-digital-in-october-2019>
- World Economic Forum. (2018, 10 11). Children in Singapore will no longer be ranked by exam results. Here's why. Diambil kembali dari www.weforum.org: <https://www.weforum.org/agenda/2018/10/singapore-has-abolished-school-exam-rankings-here-s-why/>
- actualitix.com. (2018). No Title. <https://en.actualitix.com/country/sgp/singapore-human-development-index.php#chart>
- Aji, W. N., & Budiyo, S. (2018). The Teaching Strategy of Bahasa Indonesia in Curriculum. *International Journal of Active Learning*, 58(2), 58–64. <http://journal.unnes.ac.id/nju/index.php/ijal>
- Ali, A. (2011). Higher education in Asian countries and the role of international organizations in its development : a comparative study by A Thesis Submitted in Partial the Degree of Ph . D . in Education Sciences. Criticism.
- Antara news. (2020, January 28). indonesia-singapore-cooperate-to-improve-industrial-competitiveness. Diambil kembali dari en.antaranews.com: <https://en.antaranews.com/news/140399/indonesia-singapore-cooperate-to-improve-industrial-competitiveness>
- Art, N. E. (2003). Act of the Republic of Indonesia on National Education System 1. System, 20, 1–58.
- ASEAN. (2019). ASEAN DECLARATION ON INDUSTRIAL TRANSFORMATION TO INDUSTRY 4.0. In ASEAN.orgorg. <https://asean.org/storage/2019/11/1-issued-ASEAN-DECLARATION-ON-INDUSTRIAL-TRANSFORMATION-TO-INDUSTRY-4.pdf>

- ASEAN. (2020). ASEAN DECLARATION ON HUMAN RESOURCES DEVELOPMENT FOR THE CHANGING WORLD OF WORK. <https://asean.org/storage/2020/06/ASEAN-Declaration-on-Human-Resources-Development-for-the-Changing-World-of-Work.pdf>
- Burmester, N. (2019). International Organizations as Actors and Arenas in International Politics. *The Journal Politica*, 11-12.
- CNBC. (2018, January 24). DAVOS WEF. Diambil kembali dari [cnn.com](https://www.cnn.com/2018/01/24/germanys-needs-to-modernize-and-embrace-digitalization-merkel-says.html): <https://www.cnn.com/2018/01/24/germanys-needs-to-modernize-and-embrace-digitalization-merkel-says.html>
- Cash, H., D. Rae, C., H. Steel, A., & Winkler, A. (2012). Internet Addiction: A Brief Summary of Research and Practice. *Current Psychiatry Reviews*, 8(4), 292–298. <https://doi.org/10.2174/157340012803520513>
- Educational Research Centre. (t.thn.). www.erc.ie. Diambil kembali dari *Studies*: <https://www.erc.ie/studies/pisa/what-is-pisa/#:~:text=PISA%20is%20a%20project%20of%20the%20Organisation%20for,2000%2C%20PISA%20has%20been%20implemented%20every%20three%20years>.
- Ellis, W. F., McAleer, B., & Szakas, J. S. (2014). Internet addiction risk in the academic environment. 2014 Proceedings of the Information Systems Educators Conference, ISECON 2014, 13(September), 100–105.
- Festiyed. (2015). Mengintegrasikan Pendekatan Saintifik Melalui Model Inkuiri Dan Authentic Assessment.
- Gleason, N. W. (2018). Higher Education in the Era of the Fourth Industrial Revolution. *Higher Education in the Era of the Fourth Industrial Revolution*, 1–229. <https://doi.org/10.1007/978-981-13-0194-0>
- Jamaludin, R., McKAY, E., & Ledger, S. (2020). Are we ready for Education 4.0 within ASEAN higher education institutions? Thriving for knowledge, industry and humanity in a dynamic higher education ecosystem? *Journal of Applied Research in Higher Education*, 12(5), 1161–1173. <https://doi.org/10.1108/JARHE-06-2019-0144>
- Karns, M. P., Mingst, K. A., & Stiles, K. W. (2015). Karns, M. P., Mingst, K. A., & Stiles, K. W. (2005). International organizations: the politics and processes of global governance. *En International organizations: the politics and processes of global governance* (Vol. 42, pp. 42–4280–42–4280). <https://doi.org/10.1017/9780521875883.002>. In *International organizations: the politics and processes of global governance*.
- Kemp, S. (2019, October 23). we are social. Diambil kembali dari *Digital 2019 Q4 Global Digital Statshot*: <https://wearesocial.com/blog/2019/10/the-global-state-of-digital-in-october-2019>
- Lewis, P., & Rupp, K. (2016). Liberal Education in Asia: Trends, Challenges, and Opportunities. *New Global Studies*, 9(3), 245–266. <https://doi.org/10.1515/ngs-2015-0028>
- Mas'oed, M. (1990). Ilmu Hubungan Internasional : Disiplin dan Metodologi. (p. xi + 371 hlm).
- OECD. (2019). PISA 2018 Results. Combined Executive Summaries. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699. www.oecd.org/about/publishing/corrigenda.htm.
- OECD. (2018). [oecd.org](http://www.oecd.org/pisa/PISA-results_ENGLISH.png). Diambil kembali dari PISA results: https://www.oecd.org/pisa/PISA-results_ENGLISH.png
- Programme, T., Assessment, I. S., & Tables, I. (2018). Country Note: Singapore, PISA result 2018. 1–10.
- Sa'adah, M. (2020). Studi komparatif reformasi pendidikan di Singapura dan Indonesia. *Jurnal Pembangunan Pendidikan: Fondasi Dan Aplikasi*, 7(1), 70–79. <https://doi.org/10.21831/jppfa.v7i1.25273>
- Saravanan, V. (2005). 'Thinking Schools, Learning Nations' Implementation of Curriculum Review in Singapore. *Educational Research for Policy and Practice*, 4(2), 97–113. <https://doi.org/10.1007/s10671-005-1543-x>
- Sugito. (2016). Organisasi Internasional . Yogyakarta: The Phinisi Press.
- The ASEAN Secretariat. (2019). Integration Report 2019.

UNDP. (2020). 2020 HDR Technical Notes.

http://hdr.undp.org/sites/default/files/hdr2020_technical_notes.pdf

World Economic Forum. (2018, 10 11). Children in Singapore will no longer be ranked by exam results.

Here's why. Diambil kembali dari www.weforum.org:

<https://www.weforum.org/agenda/2018/10/singapore-has-abolished-school-exam-rankings-here-s-why/>