

# Comparative analysis - Innovation initiatives in Malaysia

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DOI: 10.29322/IJSRP.9.12.2019.p9684

<http://dx.doi.org/10.29322/IJSRP.9.12.2019.p9684>

**Abstract** - This conceptual paper explores the state of innovation and factors that need to be implemented and rectified to improve innovation initiatives in Malaysia. Although many initiatives had taken by Malaysia to build and improve the innovation ecosystem in Malaysia, the outcome of innovations in Malaysia is not par with other countries in Asian continent.

**Index Terms:** innovation initiatives, innovation ecosystem, Malaysia

## I. Introduction

According to Narayanan. S and Wah .Y.L (2016), Malaysia had taken initiatives to build and improve its innovation ecosystem. Malaysian government had allocated higher budget for Science and technology, research and development and human resource development. For an instance, the budget allocation for education and training has doubled from 10.1% of total development expenditure in 1981-1985 to 20.6% in 2006-2010 and 2015-2018 is 31.6% It shows Malaysia's effort and commitment to improve its innovation strategies.

Moreover, Malaysia had taken the following initiatives to enhance its innovation strategies such as the incorporation of development of science and technology and research and development into national development plan since 1986. To encourage the private sector participation in innovation, various programmes have been initiated including the grant allocation for their research and development activities, provide support for commercialization of research and development findings, facilitate the purchasing of technology and development of science and technology infrastructure. In recognizing the role of information and communications technology (ICT) in developing innovation strategies the budget allocation for ICT development has been continuously increasing from 2.6% (in 1996-2000) of development expenditure to 6.4% (in 2006-2010) (Hamri Tuah, Devendran Nadaraja & Zakiah Jaafar, 2009).

## II. Current state of Innovation in Malaysia

According to the Global Innovation Index (GII) (2019), only three countries from Asian continent remained in the top 20 for year 2019. The three countries that placed in top 20 were Singapore (8<sup>th</sup>), Hong Kong (13<sup>th</sup>) and South Korea (11<sup>th</sup>). Japan was placed at (15<sup>th</sup>) while Malaysia was (35<sup>th</sup>). Figure 1.0 shows that Malaysia scores' in human capital, infrastructure, research and development and creative output were relatively lower than other Asian countries such as Hong Kong, Japan, Korea as well as Singapore.

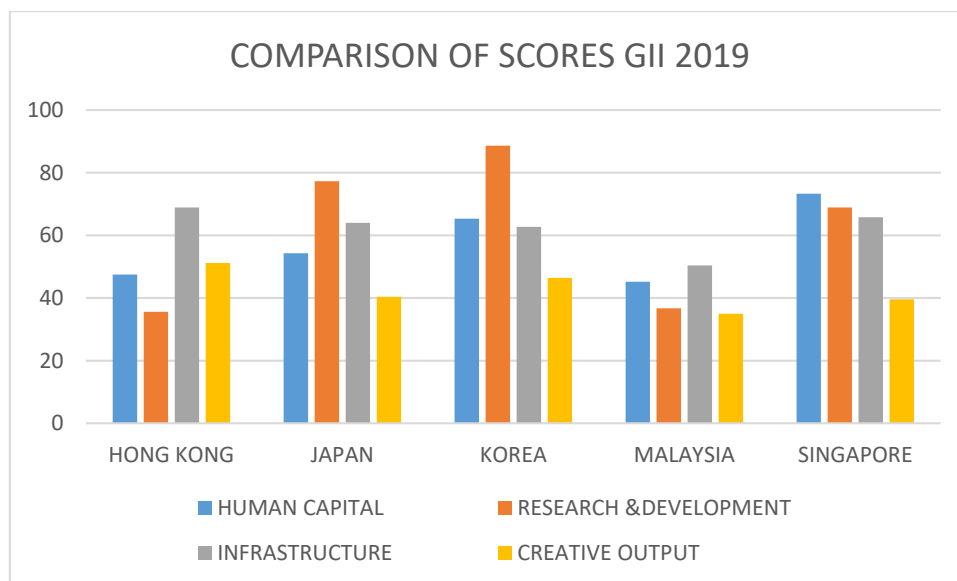


Figure 1.0: The ranking of five countries – Hong Kong (China), Japan, South Korea, Malaysia and Singapore for the year 2019 in human capital, infrastructure, research and development and creative outputs. (Adapted from The Global Innovation Index, 2019)

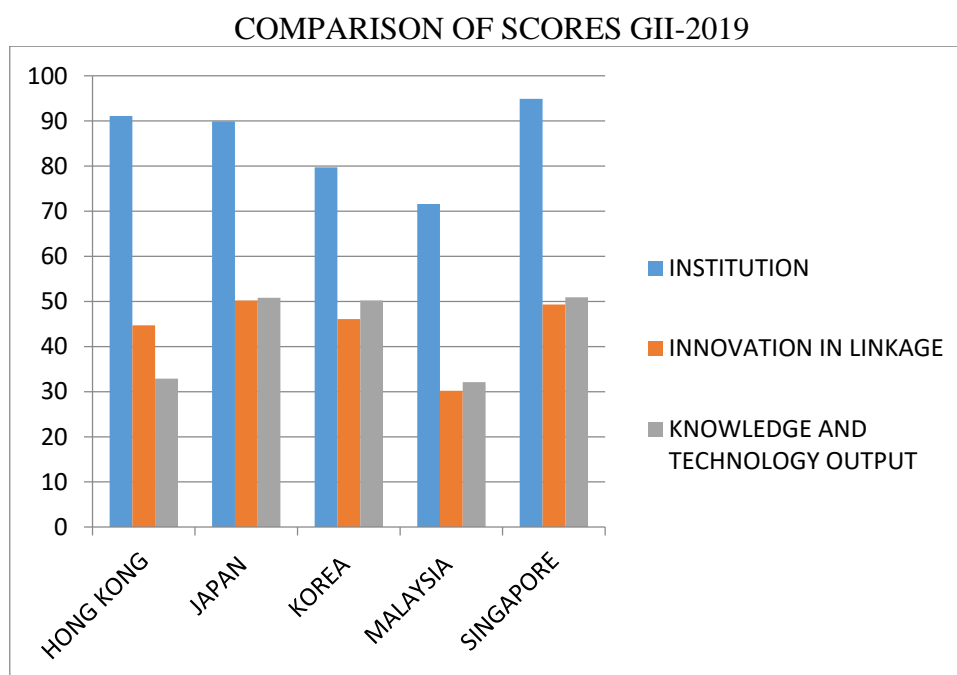


Figure 2.0: The ranking of five countries – Hong Kong (China), Japan, South Korea, Malaysia and Singapore for the year 2019 in institutions, innovation linkages and knowledge and technology outputs (Adapted from The Global Innovation Index, 2019)

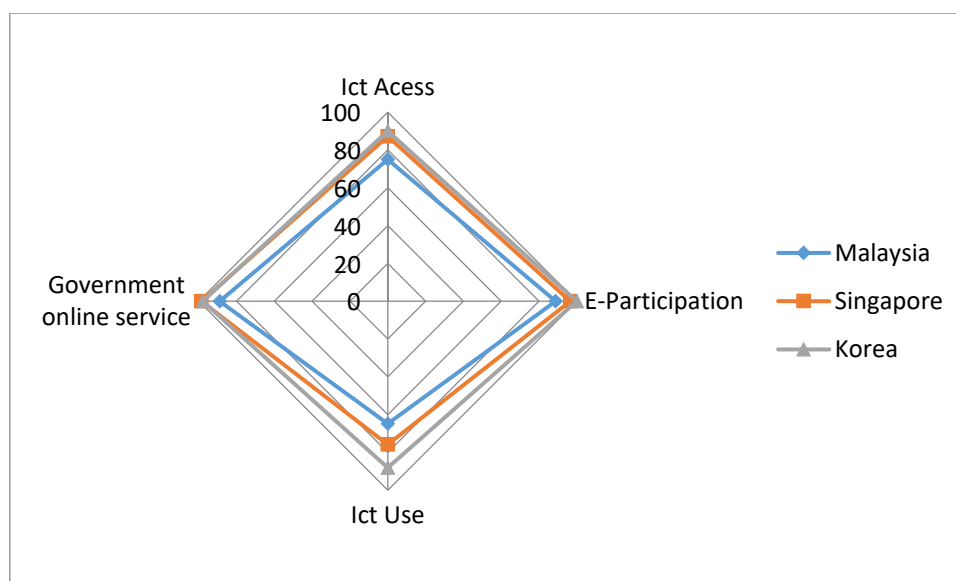


Figure 3.0: Malaysia's performance in the Global Innovation Index (GII) – ICTs Sub pillar (Adapted from The Global Innovation Index, 2019)

By referring to the above graphs (see figure 1.0, 2.0 and 3.0), it is very clear that Malaysia was ranked lowest for all categories that has been selected. Malaysia was trailing behind in all categories or sub categories. The performance in all these main and sub categories determined their overall ranking in GII. In addition to that, Malaysia's effort to improve the usage of ICT also unsatisfactory compared to Singapore or Korea (see figure 3.0). Moreover, MPC (2015) reported that Malaysia was positioned 52<sup>nd</sup> out of 60 countries in terms of Internet speed and this is far behind compare to Hong Kong or Singapore. Malaysia offered Internet bandwidth speed of 10.65 kbps per user while Hong Kong (1,046 kbps) and Singapore (343.73 kbps). Thus, is Malaysia moving in the right direction in upgrading its innovation capability?

### III. Innovation Factors

In the following section, we would discuss some of the innovation factors that Malaysia need to improve in order to be par with its other counterparts in Asia.

#### A. Innovation, education and training

Malaysian government targeted the development of tertiary education especially in science and technology as one of the major step in acquiring the state of a knowledge-based economy or developed nation by 2020 (Goujan and Samir, 2006). However, the data collected showed that Malaysia still far behind in producing skilled workforce or tertiary educated workforce.

Malaysia and Singapore population with tertiary education is increasing. However, Singapore is leading in this sector. According to OECD (2019), only 47.8% Malaysian labour force in 2019 had tertiary qualification while graduate in science and engineering is 32.1%. According to Mun-Heng (2012), in the same period, 50.3% of the labour force in Singapore had tertiary education qualification. In fact, tertiary education in Singapore is heavily subsidized by the government, in which, tertiary students are required to pay only 30% of actual education cost. OECD (2019) acknowledged that lower level of tertiary educated labour force in Malaysia resulted in shortage of skilled workforce which contributed to weak productivity growth, lack of creativity and innovation in the Malaysian workforce. Singapore, had higher level of tertiary educated workforce.

Rosyati Abdul Rashid and Rosna Awang Hashim (2008) claimed that proficiency in English language is considered as one of the most important criteria for marketable graduate. Furthermore, Rosyati Abdul Rashid and Rosna Awang Hashim (2008) claimed that the introduction of English language as a teaching medium of instruction for the teaching of Mathematics and Science (Pengajaran dan Pembelajaran Sains dan Matematik dalam Bahasa Inggeris - PPSMI) in Malaysian primary and secondary schools beginning year 2003 was initiated

for this very purpose. However, in 2009, PPSMI policy was reverted by then Education Minister after objection from few parties (Chew Chee Khiang, Fauziah Ahmad, Faridah Ibrahim & Chang Peng Kee, 2012). Although many researchers and concerned parents prefer PPSMI it was abolished in ad hoc manner without proper research and prior consultation with parties involved.

Affero Ismail and Noshasni Zainal Abiddin (2014) claimed that effective education and training is essential in producing skilled workforce. Technical and Vocational Education and Training (TVET) will increase employee's performance, productivity and capabilities. Furthermore, the authors also claimed that by 2020, about 3.3 million jobs will be created, of which 1.3 million will be TVET based. However, the TVET sector would not be able to meet up the demand. Though the student enrolment is increasing since 2001, a few years showed drops in students' intake as there were budget and quota constraints. Moreover, 70% of TVET current graduates concentrated on lower-level skills or Malaysian Skills Certificates qualification only. Though some of the training and education programmes were affected due to a shortage in budget allocation, the Malaysian government had slashed the budget allocation for education sector from RM56billion in 2015 (BERNAMA, 2015) to RM41.3 billion for 2016 (TheStar Online, 2015).

Malaysia's initiatives in developing a creative and innovative workforce by improving education and training among Malaysians is still far behind Singapore or even Korea as it failed to upgrade the education status of Malaysian workforce on par with other developed countries such as Singapore. Adequate Budget allocation and proper and through research must be done prior introducing new policies related with education. Decision must be made based on research and statistical data and government should not modify and abolish good policies just to score political points.

### B. Innovation and skilled migrants

Singapore encourage skilled employees to obtain permanent residency or acquire Singaporean citizenship while those unskilled employees were only provided short term working permits (Goujan and Samir, 2006). On the other hand, Malaysia encourage the unskilled or semi-skilled employees to Malaysia. Kanapathy (2008) in Rahmah Ismail and Ferayuliani Yuliyusman (2014) reported that unskilled and semi-skilled employees comprises the largest portion of migrants in Malaysia. In 2006, there were 1,869,209 unskilled and semi-skilled foreign employees while there were only 55,549 of expatriates, professionals and technical migrants. Singapore and Hong Kong were placed among the top 10 productive economies that attract high-skilled employees, Japan and Korea were positioned as the next 20 most productive economies while Malaysia was ranked as one of the least productive economies (see figure 4.0).

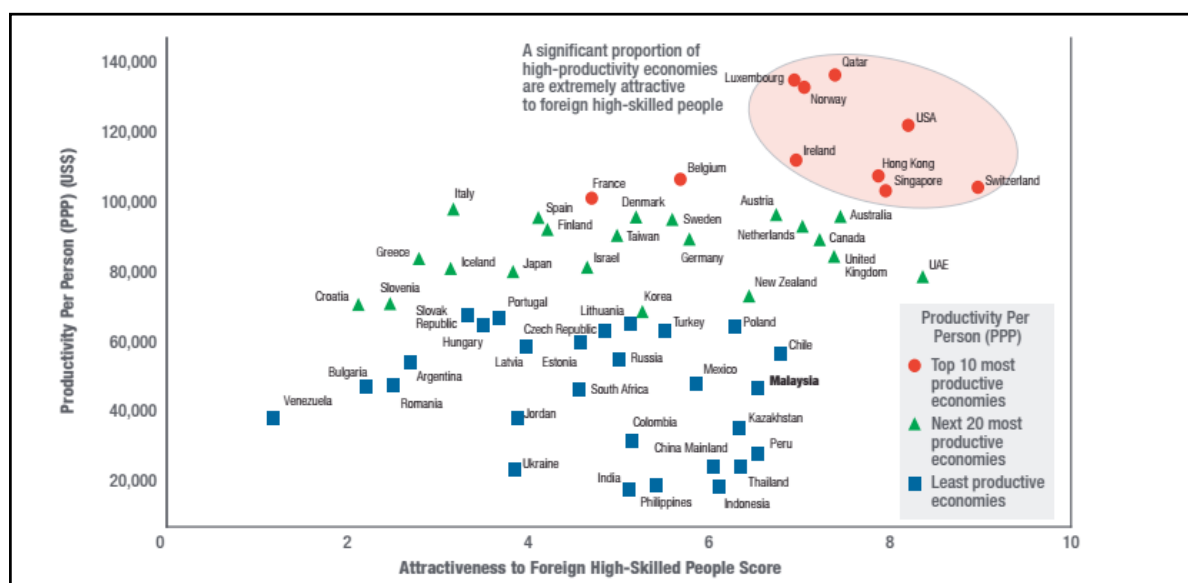


Figure 4.0: Productive countries – Attracting high-skilled people

(Source: MPC, 2015)

Salary and other benefits could be the main pulling factor that encourage skilled or professional employees even from Malaysia to migrate to Singapore. According to MPC (2015), Singapore's average salary for engineering, architecture, accounting and finance and legal were far better than Malaysia. The salary differences for some of these specialization were more than 60%.

*C. Intellectual properties for Malaysia, Singapore, Japan, China and Korea*

Table 1 and Table 2 represented the intellectual properties (patents, trademarks and designs) registered for the aforementioned countries from year 2010 to 2018.

Table 1: Statistics of Trademarks registrations for Hong Kong, Japan, Malaysia, Korea and Singapore from year 2010 to 2018

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>China(Hong Kong)</b>	8482	8430	9111	11144	12095	14376	13336	14509	14953
<b>Japan</b>	1841	2107	2156	2545	2075	2158	2350	2524	3076
<b>Malaysia</b>	88	84	97	139	127	139	257	128	219
<b>Korea</b>	331	339	448	498	694	1343	1205	1050	1163
<b>Singapore</b>	263	330	300	314	378	440	525	582	581

(Adapted from Intellectual property department, 2019)

Table 2: Statistics of designs registered for Hong Kong, Japan, Malaysia and Singapore from year 2010 to 2018

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>China(Hong Kong)</b>	1,794	1,638	1,468	1,437	1,421	1360	1078	1127	1282
<b>Japan</b>	404	467	348	421	355	280	321	387	399
<b>Malaysia</b>	1	0	0	5	7	2	2	3	13
<b>Singapore</b>	29	268	60	39	20	8	11	10	7

(Adapted from Intellectual property department, 2019)

Table 3: Patents Granted by the United States Patent and Trademark Office .

Year	Malaysia	Japan	Korea	Singapore	China
Pre-2002	485	962	21,706	1,261	1,091
2002	55	34,858	3,786	410	288
2003	50	35,515	3944	427	297
2004	80	35,346	4428	449	403
2005	88	30,340	4351	346	402
2006	113	36,807	5908	412	659
2007	158	33,354	6295	393	770
2008	152	33,362	7548	399	1223
2009	158	35,501	8762	436	1654
2010	202	44,813	11671	603	2655
2011	161	46,139	12262	647	3174
2012	210	50,677	13233	810	4637
2013	214	51,919	14548	797	5928
2014	259	53,484	16469	946	7236
2015	256	52,409	17924	966	8116
<b>TOTAL (2002-2015)</b>	2156	575208	131129	8041	37442

Source: United States Patent and Trademark Office .

Based on the above statistics, Malaysia is far behind than other countries such as Singapore, China, Japan and Korea. Although Malaysian government provides various fund allocations and grants for research and development, obviously it is insufficient to stimulate the creation of intellectual properties or innovative strategies in Malaysia. We are still considered as the user of innovative products and services rather the developer.

#### *D. University rankings*

Malaysian university ranking also declining in recent years. According to QS World University Rankings (2019/20) Singapore's two universities were placed in top 15 ranking. The two universities are National University of Singapore (11<sup>th</sup>) and Nanyang Technological University (12<sup>th</sup>). Universiti Malaya, Universiti Sains Malaysia, Universiti Teknologi Malaysia, Universiti Kebangsaan Malaysia and Universiti Putra Malaysia were ranked as 87, 207, 228, 184 and 202 respectively. Four universities in Hong Kong were ranked in top 50 positions. On other hand, Japan's universities ranking also better than Malaysian's public varsities such as Kyoto University (38<sup>th</sup>), The University of Tokyo (23<sup>th</sup>), Tokyo Institute of Technology (58<sup>th</sup>) and Osaka University (67<sup>th</sup>). Although the number of public and private varsities are increasing in Malaysia, the improvement on the quality is not encouraging.

#### IV. Conclusion

Malaysia must improve its innovation strategies in order to compete with other Asian countries such as Singapore, Japan, China (Hong Kong) and Korea. Innovation strategies and development are crucial in upgrading Malaysia as developed country. Singapore with a smaller population and without natural resources is moving ahead in innovation. Its performance is better even in latest GII annual survey. Japan, although suffered from natural disasters, stagnant innovation and aging population still performed better than Malaysia.

In my opinion, Malaysia should invest heavily in education sector. Education and training must have a higher priority in development and also budget allocation. Innovation can be developed if workforce is highly skilful and knowledgeable. Public and private varsities should concentrate on more research and development. Government should provide adequate fund for research and development activities.

Government should make Malaysia as an attractive destination for skilled workforce and professionals to work. Better incentives, salary and fair treatment should be given to all to avoid brain drain. There must be a continuous assessment and research on innovation strategies and the result should be made public and corrective actions must be taken to improve those innovation categories. Private sector too should play an active role in developing Malaysia's innovation strategies. They should introduce innovation to varsity students prior to their graduation during their industrial trainings. Private sector could also provide funds and grant allocations for design and development of products and services. One should not ignore the fact that many of the innovations that we had today were created by inventors when they were still pursuing their tertiary education. For an instance, Larry Page and Sergey Brin developed Google as their PhD project, Microsoft were founded when Bill Gates and Paul Allen were students at Harvard University, or Facebook was launched by Mark Zuckerberg when he was still a student at Harvard.

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