Development of a Human Capital for Malaysia through the Reform of Education

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Abstract

In 2018, the World Bank recommended an index to forecast Human Capital productivity based on four components. Based on healthy 17-year-olds, this study examined their potential. Investigated the potential of 17 graders described in the HCI. Methods - The HCI index includes schooling years, test scores, and child survival. This study compares 12th-grade results with 17th-grade results based on national examinations. SPSS paired t-tests were used with 102 students who took national exams from 2009 to 2018. Limitation. Finances prevented health coverage. Results indicate that the null hypothesis is rejected. There is a need for further research into health coverage.
Keywords: Human Capital Index in Malaysia, Early Education, Country growth,

1.0 Introduction

The World Bank introduced the human capital index (HCI) as a new method for predicting the future productivity of a country's citizens. The HCI combines indicators of health and education into a measure of the human capital that a child born today can expect to achieve by her 18th birthday, given the risks of poor education and health that prevail in the country where she lives. The HCI is measured in productivity units relative to a benchmark of complete education and full health and ranges from 0 to 1. A value of x on the HCI indicates that a child born today can expect to be only x × 100 per cent as productive in future work as she would be if she enjoyed complete education and full health (Kraay, Aart. 2019). Human capital is being actively studied. However, there is only a limited amount of evidence discussing the index. Therefore, this exploratory study aims to investigate one of the five HCI elements, children's education, and the association between the children's educational performance when they were 12 and 17 years old. Malaysia's HCI is 0.62, Singapore's is 0.88, Hong Kong scored 0.82 per cent, Japan scored 0.84 per cent, and South Korea scored 0.84 per cent in 2020 (The World Bank,n.d). The HCI in Malaysia shows that a child born today will be 62 per cent as productive as she would be if provided a full education and adequate health care.

1.1 Malaysian Labor Force Current situation

In Malaysia, the rapid advancement of the country requires high investments in human capital that will strengthen the industry's growth and serve as a backbone for the country's development plans. Nevertheless, managing human capital presents significant challenges to the country. According to Monash University (2018), Malaysia will not face a lack of jobs but a shortage of skills required for future jobs. Therefore, the country should increase its labour force output and calibrate the development of its people skills to the labour market's demands (ICEF Monitor, 2017). Despite positive economic growth in 2022, the unemployed graduates in 2021 were 197.1 thousand. Vacancies for professional jobs recorded in the same year were 44.9 thousand, while those for semi-skilled jobs were 102.2 thousand. (Department of Statistics Malaysia, 2022). Based on the number of unemployed and the job vacancies, only 50.1 thousand are unemployed. This is if the skills match the vacancies, which explains that the economy's ability to create jobs remains at 65.2%. The unemployment rate was 3.9% in 2022.

According to previous studies, Malaysian workers, particularly graduates, need more critical thinking skills, communication skills, language proficiency, and positive personality traits (Mohd Salleh, 2018), which consequent mismatch between employers' requirements and product offerings of higher education institutions. These situations contributed to the high rate of youth unemployment and, consequently, the moderate performance of the national economy. In the OECD Economics Survey (2019) – which provides an overview of the living standards within a particular country as a measure of the inclusiveness of growth, Malaysia scored well in the economy but some indicators, especially long-term employment. It has demonstrated relative weaknesses in education attainment, skills, and personal earnings (OECD iLibrary. (n.d.). Improving education quality and training skills are

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essential for enhancing a person's lifetime earning potential and social mobility while promoting social cohesion and well-being over the longer term. As such, Malaysia must pursue some plans to develop its human capital, particularly in increasing skilled workers.

Despite the pandemic, Malaysia's economic growth was 8.7% in 2022, the highest annual growth in 22 years since 2000 (Economic and Financial Developments in Malaysia in the Fourth Quarter of 2022 - Bank Negara Malaysia, 2023). Malaysia's economic performance improved from 3.1% in 2021 to 8.7% in 2022, the highest annual growth in 22 years since 2000. The country's performance is determined by its services as the economic sector. The country earned a gross domestic product (GDP) of US373 billion from its economy, with a population of more than 32.7 million (GDP per capita (current US$) | Data. Data.worldbank.org. (2021). Fifteen million people are serving Malaysia high labour participation rate (69.8%) and low unemployment rate (3.9%) in 2022 (Department of Statistics Malaysia Official Portal, 2023) have helped Malaysia expand its economic growth. Thus, Malaysia has a huge potential for development soon. However, it must focus on improving its human capital and producing more skilled workers, enabling them to become the backbone of the country's long quest to become a developed country.

As discussed, most of the labour force was from a semi-skilled level of education, accounting for 58.4 per cent of the workforce, followed by those with a professional level of education (30.1%) and low-skilled (13%) in 2022. To become a developed nation by 2024-2028, the skilled worker percentage needs to be increased to 40% and have a national per capita income of at least US12,236 per year. However, in 2021 Malaysia's gross national per capita income was estimated at only US11109.3 (GNI per capita, Atlas method (current US$) - Malaysia. (n.d.). Secondly, the number of semi-skilled jobs comprised 62.3 per cent of total jobs (5.344 million jobs). This can be explained further by looking at the employed person by educational attainment (Table 1). Most employed were secondary school graduates (8.19 million), representing 54.1% of all employed individuals. In 2020, the proportion of employed individuals with tertiary education was recorded at 5.05 million (33.3%). Thus, more than half of employed persons still need tertiary education—the low-skilled workers representing 10.4% and 2.2% with primary or no formal education backgrounds.

Table 1: Employed Person by educational attainment, Malaysia 2019 and 2020

	2019	2020
Tertiary	4.43 mill 29%	5.05 mill 33.3%
Secondary	8.47 mill 55.5%	8.9 mill 54.1%
Primary	1.89% 12.5%	1.58 mill 10.4%
No formal education	0.45 mill 3%	0.34 mill 2.2%

Source: Department of Statistics Malaysia Official Portal, 2022

Currently, the government actively encourages graduates to be self-employed, mainly by organizing programs that develop entrepreneurial skills. Accordingly, the government, industries, and institutes of higher education have collaborated to improve the employability of local graduates under the 12th Malaysian Plan. Based on the strong background of Malaysia's economy and society, human capital needs to be focused. This study investigated whether there is a relationship between younger child's performance with when their become teenager to identify the significance of human capital productivity that stated begins at a young age, as suggested by the HCI. This research has the potential to guide dealing with human capital development, particularly in addressing the significance of children's educational plans.

1.2 Issues in Education

The Performance of Student Assessments (PISA) 2018 report indicated that Malaysia was still lagging. Malaysia's education quality has been long discussed; Wing (2019) emphasized that ten years ago, Malaysia's education quality was low, according to an OECD survey of 65 countries in 2012. According to the report, Malaysia ranked 52nd in math, 59th in reading, and 53rd in science (Table 2). Malaysia has been included in the following categories: Countries/economies with a mean performance/share of top performers below the OECD average and Countries/economies with a share of low achievers above the OECD average.

Table 2 PISA 2012 Performance of Selected East and Southeast Asian Countries

Country	Mathematics	Reading	Science
	Position		
China	1	1	1
Singapore	2	3	3
Hong Kong	3	2	2
Taiwan	4	8	13
South Korea	5	5	7
Macau	6	16	17
Japan	7	4	4
Vietnam	17	19	8
Thailand	50	48	48
Malaysia	52	59	53
Indonesia	64	61	64

Source: OECD (2014).

The target since 1967 of 60% of secondary students in the science stream has yet to be achieved (Phang et al., 2020). Data from the Trends in International Mathematics and Science Study (TIMSS) shows a downward trend. Table 3 shows the ranking of Malaysia TIMSS for 20 years recorded a decrease in the percentage of students on the advanced benchmark from 5% in 1999 to 3% in 2019. Compared to Singapore, the achievement of TIMSS is the best among ASEAN countries. 2011, for example, 40% of Singaporean students were on the advanced benchmark compared to only 1% in Malaysia (Table 3).

Table 3 Malaysia's Achievement in TIMSS Science between 1999 and 2019

Year	Ranking/Total Countries		Average Score		% of students at Advanced benchmark	
	Malaysia	**Singapore**	**Malaysia**	**Singapore**	**Malaysia**	**Singapore**
1999	**22/38**	**2/38**	**492**	**568**	**5**	**29**
2003	**20/50**	**1/50**	**510**	**578**	**4**	**33**
2007	**21/60**	**1/60**	**471**	**567**	**3**	**32**
2011	**32/42**	**1/42**	**426**	**590**	**1**	**40**
2015	**24/39**	**1/39**	**471**	**597**	**3**	**42**
2019	**29/39**	**1/39**	**460**	**608**	**3**	**48**

Source: Phang, Khamis, Nawi, Pusppanathan. (2021)

Studies show that Malaysian students are highly interested in Science (Phang, 2014). However, students need more confidence in science learning. They regard science as complex (Wong et al., 2021). Therefore, various efforts must be implemented to increase students' confidence in science learning. This includes training teachers with science teaching skills and providing a conducive science learning environment. This is important because data shows emerging skills closely relate to STEM education (Science, Technology, Engineering and Mathematics) (The World Forum, 2020). Therefore, STEM education should be given attention in quantity and quality. The WEF (2020) reported that 70% of the emerging skills in Malaysia demand high-order thinking skills (HOTs), such as analytical thinking, creativity, innovation, reasoning, and ideation. Future jobs also demand technology skills and programming.

Therefore, the is a need for more investment in education to prepare future labour with the quality needed for future jobs. Table 4 compares the education and skills performance in Malaysia and Singapore as the country ranked among the top performers. The data indicated that Singapore recorded higher education and skills performances than Malaysia.

Table 4 The Malaysia and Singapore Education and Skills Performances

Malaysia		Singapore	
Education and Skills	%	Education and Skills	%
Digital skills among the active population Weighted average 2019-2020	66.3	Digital skills among the active population Weighted average 2019-2020	77
Attainment of basic education 2016	74.2	Attainment of basic education 2018	81.4
Business relevance of basic education Weighted average 2019-2020	58.4	Business relevance of basic education Weighted average 2019-2020	67.6
Attainment of advanced education 2016	18.8	Attainment of advanced education 2018	46.7
Business relevance of tertiary education Weighted average 2019-2020	65.2	Business relevance of tertiary education Weighted average 2019-2020	79
Supply of business-relevant skills Weighted average 2019-2020	64.4	Supply of business-relevant skills Weighted average 2019-2020	69.1

*The figures presented for these indicators are rebased on 0-100% progress scores, with 0 being the worst performance and 100 being the best performance

2.0 Literature Review

Human capital is essential to economic growth (EG) (Smith, 2000; Son, 2010), and the economic growth of a nation depends on its population accumulating skills, knowledge, and innovative capabilities (Ugal & Betiang, 2009). People with skills and knowledge will contribute more and become valuable human capital (Schultz, 1961). Human capital productivity should be facilitated by technological innovation and adaptation (Banerjee & Roy, 2014) and by eliminating all forms of inequality (Barro, 1991). The education aspect of the HCI: Many empirical studies have proved that education is the main determinant of positive impact on EG in many countries; for instance, Self and Grabowski (2004) in India, primary and secondary education had a strong causal impact on economic growth, Bratti et al. (2004) involve a cross-country study reported the primary and secondary education to contribute to productivity, Villa (2005) found higher and secondary education had a positive effect on economic growth while primary education had no effect. Haouas and Yagoubi (2005) studied involving MENA countries and found that average human capital significantly influences growth but does not affect productivity growth. Park's (2004) study involved 94 developed and developing countries' educational attainment levels- human capital positively influences productivity growth. Sianesi and Van Reenen (2000) concluded that an overall 1 % increase in school enrolment rates leads to a GDP per capita growth of between 1 and 3%. Sylwester (2000) has suggested that current educational expenditure leads to future economic growth. Finally, in Malaysia, Shanahan et al. (2011) reported that in Malaysia, secondary education had significant positive effects in the short run, unlike primary and tertiary education in the long run, which had a significant positive effect on EG. The fact that there are more stunted children in Malaysia than in Africa is alarming (The Edge Malaysia (2018). Inadequate knowledge of a child's diet results in stunted children due to insufficient feeding. According to the World Health Organisation (WHO)(2021), women, infants, children, and adolescents are at particular risk of malnutrition. Optimizing nutrition early in life—including the 1000 days from conception to a child's second birthday—ensures the healthiest possible start, with long-term benefits. Globally in 2020, 149 million children under five were estimated to be stunted (too short for age), 45 million were estimated to be wasted (too thin for height), and 38.9 million were overweight or obese (The Edge Malaysia (2018). The government should increase its awareness of mother and child well-being and provide a higher budget to enable its people to succeed. Children's health in Malaysia should be based on height and weight. Malaysia's birth rates have been declining since the 1990s, which is also concerning (The World Bank (n.d.). It may be due to the rising cost of living, which causes women to work to support their families (Noor & Zainuddin, 2011). Compared to the 1960s and 1980s, when most families had six to ten children, today, they have fewer than five children (Barro, 1999).

3.0 Methodology

Child survival, stunting, adjusted school years, health, and test scores result in productive human capital. Test scores are the focus of the study, while the other items are defined in Table 5. The study investigates the test scores specifically, determining whether the test scores of 12-year-olds correlate with those of 17-year-olds. In this study, the objectives were to: (1) evaluate the association of examinations taken at 12 and 17 years old, (2) evaluate overall student performance as to whether they are healthy, survived, and completed the academic years (primary and secondary). H0: There is no relationship between the test scores of 12-year-olds and the scores of 17-year-olds; H1: There is a relationship between the test scores. A purposive sampling technique was used, which included individuals who had taken the national exam. The data collection technique used consisted of respondents' backgrounds and examination results. The data analysis employed was Paired Sample T-Test. Their scores in selected subjects, Malay language, mathematics, and science, and their backgrounds. A total of 118 students filled out the online questionnaire for this study. The data were sorted and removed 16 respondents if a value was missing. The selected students will be tracked through primary school and beyond until they complete Form 5. The selected participants in this study were those who had taken PMR and then SPM. Table 5 shows the measurement of each HCI component used in this study:

Table 5: The Definitions of HCI Items

HCI Items	Definitions by Kraay (2018)	Study's definition
Child survival	It shows that not all children born today will accumulate human capital through formal education.	All participants were healthy when the study was conducted
Years of School.	In order to estimate age-specific enrollment rates, four and five-year-olds are enrolled in preprimary; six to eleven-year-olds are enrolled in primary; 12 to 14-year-olds are enrolled in lower secondary; and 15 to 17-year-olds in upper secondary.	Based on 8-11 years of schooling and test scores. In line with Malaysian education levels, the primary level is 12 years old, and the secondary level is 17 years old.
Test result	Test scores from major international student achievement testing programs reflect the quality of education. International student achievement test scores harmonized. A TIMMS-Test score of 300 is considered minimal attainment, while a score of 625 is considered advanced.	Reading, problem-solving, and numerical elements influenced the selection of the Malay language, Mathematics, and Science.
Health	An analogy to years in school as a standard metric of education attainment is the number of years spent in school. In the absence of such a measure, two proxies for the overall health environment are used: Adult survival rates, defined as the fraction of 15-year-olds that survive until age 60, and the rate of stunting for children under age 5.	Defined by a participant's health is considered healthy after completing their studies and taking national examinations.

4.0 Results
One hundred two students took the national examinations (PMR and SPM) when they were 12 and 17. Table 5 presents the respondents' background, and Table 4 presents the respondents' test score results. Most respondents were born in 1998, were all in good health, and had completed schooling between 6 and 11 years. All of them were healthy when they took the survey. The respondents mainly were Bumiputera Sabah at 73.5%, followed by Malay (21.6%). 74.5 per cent of them female, and 24.5 per cent male. Notably, most of the respondent's parents were moderately skilled workers, followed by those with low skills (21.6%).

Table 6 Background Of Respondent

Year born	N	%	Parent job	N	%
1995	1	1	Highly skilled	1	1
1996	1	1	Moderate skilled	55	53.9
1997	4	3.9	Low skilled	22	21.6
1998	42	41.2	Pensioner	11	10.8
1999	14	13.7	Unemployed	13	12.7
2000	11	10.8			
2001	17	16.7	Gender		
2002	11	10.8	Male	25	24.5
2004	1	1	Female	77	75.5
Race			Health		
Malay	22	21.6	Healthy	102	100
Bumiputera	75	73.5	Not healthy	0	0
Chinese	4	3.9			
Indian	1	1.0			

A large percentage of grade A (59.8%) in the respondents' UPSR test scores for BM subjects. The mathematics subject indicates that the highest score obtained is grade B, with 55.9%. The mathematics subject also shows that grade B was the highest score (36.3%). For respondents' SPM test scores, the highest was grade A with 40.2%, followed by science, in which grade B was the top score (36.3%). For the math subject, respondents' score shows that grade C was the most significant (31.4%).

These results are obtained from statistical tests using a paired sample t-test with the compare means method. BM (Malay language) subjects showed a significant relationship with a 2-tailed sig value of 0.000 and an alpha of 5%. The BM subject value increased by 23%. For Math subject, a significant level (0.004< 0.05) and thus, it can be concluded that the Math score taken for UPSR is related to the Math value taken for SPM. It can also be seen in the 15% increase in Math value. Compared to alpha 5% (95% confidence level) with 0.236>0.05, the 2-tailed significant value in science is as high as 0.236, so there is no significant correlation between UPSR and SPM examinations. The result of a 6% decrease in science mean value in SPM is supported by the lower mean value. Based on Table 5, this study concludes that the null hypothesis is rejected at the 5% significance level. The H1 is supported and explains that there was a relationship between child's test scores when

they were 12 years old and their test score when they were 17 years old for BM and Math subjects. However, science shows no correlation between the two examinations, only a slight difference of 6%. Thus, the H0 failed to be rejected, but the H1 was accepted.

Table 7: Paired Sample Test

Paired Differences									t	df	Sig. (2-tailed)
		Mean	% Correlation	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
						Lower	Upper				
Pair 1	BM BM1	.228	.599	.586	.032	.160	.295		6.638	333	.000
2	Math-Math1	.150	.566	.932	.051	.050	.251		2.939	332	.004
3	Science-Science1	-.063	.329	.967	.053	-.167	.041		-1.188	333	.236

5.0 Discussion and Conclusions

There is a correlation between a child's performance at a very young age and their performance as they grow. Thus, policies must be designed to help children develop and prepare for the future through effective Human Capital Index (HCI) plans. Additionally, improving the HCI improves a child's performance, health, and well-being. Education programs that improve children's cognitive and physical development deserve increased funding. The government should also allocate more resources to provide teachers and students with a supportive learning environment. When a mother conceives, a child's development should begin. A decent living standard, a healthy and long life, and a good education will enhance cognitive abilities. Their canon productivity is due to the lack of young and well-nourished children, who cannot attend school and learn while in school and who do not enter adulthood in good health. Humans need to have a smooth process of human development. The country should also take note of a few countries that have successfully nurtured their human capital development. Human capital development should become the country's economic strategy. Financial and time constraints prevented researchers from covering health aspects.

Acknowledgements

Paper Contribution to Related Field of Study

Ensure that children's education is essential and should be prioritized when making national budgets. Investing in children is the key to economic growth and quality of life. Practitioners can see the long-term benefits of investing in people, especially in eradicating poverty.

Authors Declaration

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Appendix: Respondent Test Score

Exam Score	UPSR						SPM					
	BM		SC		MATH		BM		SC		MATH	
	N	%	N	%	N	%	N	%	N	%	N	%
A	61	59.8	19	18.6	25	24.5	41	40.2	26	25.5	21	20.6
B	30	29.4	57	55.9	37	36.3	39	38.2	37	36.3	27	26.5
C	10	9.8	23	22.5	33	32.4	16	15.7	32	31.4	32	31.4
D	1	1.0	3	2.9	7	6.9	6	5.9	7	6.9	22	21.6