Female Tertiary Education Across ASEAN Countries: A Descriptive Analysis Based on Barro-Lee Educational Attainment Projection 2015-2020

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ABSTRACT
Female tertiary education is an essential indicator of Sustainable Development Goals (SDG) of gender equality and inclusive education. It is an important strategic focus to reduce the gender gap and ensure women's status is appreciated and empowered in the social-political-economic development of the society. This study discusses female tertiary education enrollment and completion levels for 2015 and 2020 across the ten ASEAN countries. Following Barro and Lee's projection, the average female population in ASEAN enrolled in tertiary education was less than 20% for 2020, with minimal improvement from the previous five years (15.52% - 17.76%). However, there is no clear indication of a significant gender gap, with female enrollment and completion of tertiary education are reflective of the overall population status. In addition, there are clear signs of a reduced number of female populations who have completed their tertiary education across all ASEAN countries (2020 = -7.06%; 2015 = -6.25%). These findings emphasize the need for strategic policy intervention and regional corporation to improve female involvement in tertiary education in the ASEAN region.

Keywords: *"Female Tertiary Education", "ASEAN", "Female Enrollment", "Female Completion of Tertiary Education", "Gender Gap in Tertiary Education".*

1. INTRODUCTION

Education is a fundamental human right and the peace pillar that drives sustainable development [1]. It has become the main priority focus that serves as the content and target for UNESCO. In this regard, enrollment in tertiary education provides the closest indication that a particular society is moving in the right direction. According to Michelsen and Wells [2], UNESCO emphasizes the importance of all areas of education to achieve sustainable development. Thus, comprehensive action needs to address the complex interconnections of education, gender equity, sustainable development, and sustainable lifestyle. Tertiary education institutions, in this instance, should be the place to educate both men and women with the competencies needed to support the social change process. Hence, enrollment and completion rates of tertiary education are two of the most important yardsticks to gauge the country's potential towards achieving SDGs. Therefore, this study aims to discuss the female enrollment and completion status of tertiary education in ASEAN countries.

Analysis of female participation in tertiary education addresses UNESCO's concerns on gender and women issues such as gender disparity [2], non-discriminatory prosperity [2], gender equality [3], gender gap [3], and gender empowerment [3]. Furthermore, research in this area contributes to women-nature-sustainability relations that emphasize the role of women as the agents of sustainable development [4].

2. LITERATURE REVIEW

2.1 The Importance of Tertiary Education

This study adheres to the scope of tertiary education described by Marmolejo [5], which refers tertiary education to all types of post-secondary education provided by the public and private institutions such as universities, colleges, polytechnics, community colleges, nursing schools, research laboratories, distance-learning centers, and all types of Technical Vocational Education and Training Institutions (TVET). Tertiary education is a broader term compared to Higher Education, as the latter focuses only on the education offered by universities or colleges that award degrees and professional qualifications. In this study, tertiary education

includes all ranges and types of education and training following secondary education.

Tertiary education has received more attention from the government throughout the world. Many countries have made more investments in tertiary education with the aim to improve national economic growth, develop a well-educated citizenry, enhance national competitiveness, and create an equal society [6]. According to Schofer and Meyer [7], since the 1960's tertiary education sector worldwide has experienced rapid expansion. In addition, the opportunity to further education at this level has been found to affect individual future earnings [8], better Socio-Economic Status (SES) [5], professional career development [9], and improved quality of life [10].

2.2 Gender Issues in Tertiary Education

UNESCO considered girls and women as the vulnerable groups that have been impacted by economic development activities [2]. In this regard, UNESCO's *Priority Gender Equality Action Plan* (2014-2021) highlighted alarming statistics of women's education, such as women make more than two-thirds of the world's adults' population (i.e., 750 million) who lack basic literacy and numeracy skills [3]. Numerous literature has explained the issues surrounding gender in tertiary education. For example, UNESCO points towards the gender gap in educational attainment as the main issue for education equity around the globe [3]. Other related topics such as economic opportunity, gender-based stereotypes, gender inequality, and gender disparities are all intertwined with the issue of the gender gap.

The *World Economic Forum* [11] defined Gender Gap as the difference in achievement between women and men reflected in social, political, intellectual, cultural, or economic attainments or attitudes. The Gender Gap Index, on the other hand, measures the gender differences in four key areas: health, education, economics, and politics. The latest *World Gender Gap* score released in March 2021 is 67.7%, which means a 32.3% remaining gap between men and women. Comparing to the previous report, the gap has widened by almost 0.6%.

There were contrasting reports of the gender gap in tertiary education enrollment. According to Yu and Delaney [6], the enrollment rate has seen a steady increase worldwide for both men and women. On the other hand, Stoet and Geary [12] reported that instead of women, men were underrepresented in tertiary education institutions, with women demonstrated 10% more enrollment in the majority of western countries, including the United States and OECD's countries. This is consistent with Maddrell et al.'s [13] findings which indicate that the gender gap is closing in tertiary education; however, the ongoing gender disparities are still apparent. These conflicting findings point to the importance of contextual factors such as the research settings of the respective studies. The Global Gender Gap caters to world status, while research findings are confined to their scope and research settings. The contextual influence on the gender gap and enrollment in tertiary education is related to the following discussion points of economic opportunities and gender-based stereotypes.

Contextual factors such as the country's geography and economic status (e.g., high-income, developing, & least-developed countries) indirectly influence the respective country's gender gap and disparities in tertiary education. For example, in the least-developed countries, economic opportunities are scarce, which dampens the need and motivation to pursue tertiary education [14]. There are limited job opportunities and career advantages that follow the study. Hence, women in the least-developed countries spent more time on domestic tasks [15]. According to the latest United Nations *Report of The Least Developed Countries 2021*, three ASEAN countries are listed in this category: Cambodia, Lao People's Democratic Republic (Laos), and Myanmar [14].

The social-contextual factors also influence society's mentality towards women in tertiary education. Cultural norms that create gender-based stereotypes influence individual thinking and decision to pursue tertiary education [16]. Glass ceiling effect is one of the examples of gender-based stereotypes that believe women could not achieve much through education because of their gender [3]. Another example is gender-based occupations such as women need to work as a nurse, cook, and teachers and not suitable for professional jobs such as engineers, architects, and lawyers [17]. These are the direct consequences of culturally influenced stereotypes that later discouraged women from enrolling in tertiary education.

2.3 Enrollment in Tertiary Education

The World Bank report produced by Marmolejo [5] highlighted the enrollment status of tertiary education from 1980 to 2010. Overall, the tertiary education industry has experienced dramatic expansion, diversification, and enrollment in most countries around the world. The high-income countries lead the enrollment

ratio per population and demonstrate the highest increment to almost 80% of their people. Although there was a significant increment in enrollment ratio from 2000 to 2010, the lower- and middle-income countries still lag behind the high-income countries. Furthermore, the enrollment ratio in the lower- and middle-income countries remains extremely low relative to their population. Figure 1 illustrates the Gross Enrollment Ratio according to country income group.

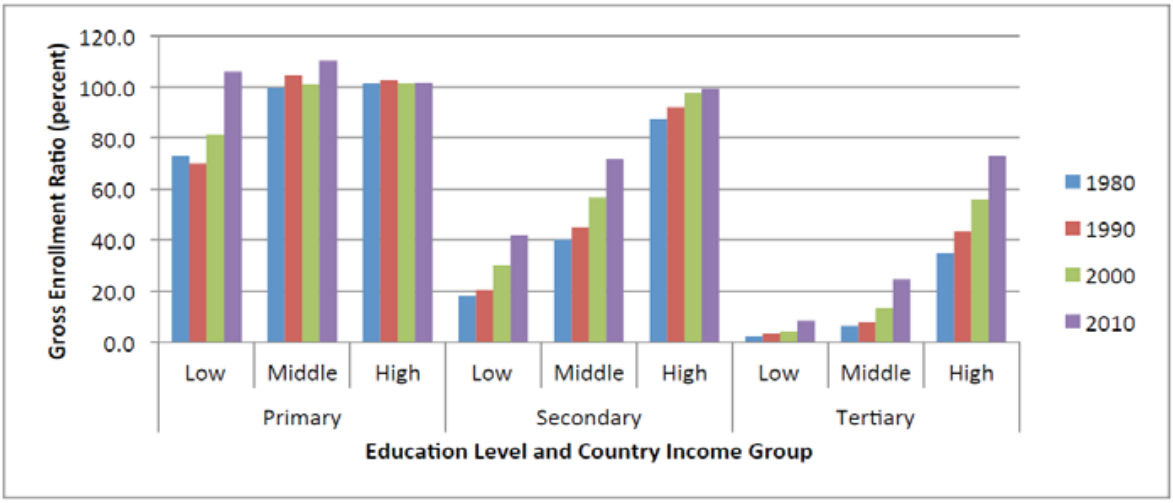

Figure 1: Gross Enrollment Ratio

According to Marmolejo [5], the enrollment pattern across the world reflects the tertiary education model that is benefitting the upper-middle-income and students from better SES families. Furthermore, this situation is intensified with the overlapping layers of inequality. People from disadvantaged and underprivileged groups (such as lower SES, minority, gender, language, age, culture, religion, disability, or caste) encounter additional barriers to access tertiary education.

Trow's developmental theory of tertiary education could be used to explain the status of tertiary education enrollment [18]. According to this theory, the growth of the tertiary education system follows three stages as reflected by its enrollment rate; (i) elite systems = gross enrollment rates less than <15%, (ii) massified systems = gross enrollment rates between 15% - 50%, and (iii) universal systems = gross enrollment rates more than >50%. Considering this projection, tertiary education in lower-income countries can be viewed as an elite system. In contrast, the tertiary education system in middle-income countries has moved from elite to massified system since 2000. During the same period, the tertiary education system in high-income countries has progressed into a universal system.

2.4 Completion of Tertiary Education

Another lingering issue in tertiary education is the completion or dropout rate. According to Aina et al. [19], a recent report from the OECD countries shows that a quarter of the students who enrolled in tertiary education left their studies without obtaining a degree. For example, the ratio of students who failed to complete their tertiary education ranges from 20% in the UK, Switzerland, and Ireland to more than 40% in Brazil, Slovenia, Chile, Sweden, Italy, Austria, and Estonia. The high dropout and incompletion rate could be the result of complex, interrelated factors that exist at the micro, meso, and macro levels. At the micro-level, demographic characteristics of the students such as age, gender, and ethnicity demonstrate a relevant association with the results. Notably, men showed a higher dropout/incompletion rate than women. At the macro level, the diversity of the tertiary education system and countries' status was also found to have significantly different from the completion and retention perspectives.

According to Marmolejo [5], one of the main obstacles in the tertiary education sector is to ensure equitable access, retention, and success of students from the vulnerable and disadvantaged groups, especially minorities, women, and low SES. It has been reported that the current tertiary education systems benefit students from the family background of higher SES, especially in both lower- and middle-income countries across different regions.

3. METHODS

This study utilized secondary data from Barro-Lee Educational Attainment Dataset (2015/2020) to identify the enrollment and completion rate of tertiary education in ASEAN countries. This dataset is the most widely used dataset to investigate the impact and changes of education attainment literature on various parameters [20]. It contains a compilation of international data from 146 countries of five years periods from 1950 to 2010 and a projection of educational attainment from 2015 to 2040 using a perpetual inventory approach. Barro and Lee estimated female, male, and population educational attainment aged 15 years and above and aged 25 years and above that comprise of the computation of six parameters; (i) no formal education, (ii) incomplete primary, (iii) complete primary, (iv) lower secondary, (v) upper secondary, and (vi) tertiary education [21].

This study focuses on ASEAN-10 countries. Except for Timor-Leste, the analysis focuses on Malaysia, Indonesia, Singapore, Brunei, Philippines, Thailand, Vietnam, Cambodia, Myanmar, and Laos. There are high diversity and uniqueness between all of these countries in terms of demographic composition, economic development, cultures, lifestyles, and languages [22]. These differences also manifested in their tertiary education access and equity [23]. Indeed, ASEAN comprises countries from different economic and development statuses. Besides the aforementioned least developed countries, the latest UN report of World Economic Situation and Prospects 2021 categorized Singapore and Brunei as the high-income countries and the other six as the middle-income countries [24].

The relevant data was acquired from the primary source of Barro-Lee Educational Attainment Dataset at http://www.barrolee.com/ [21]. For the purpose of this study, only data on tertiary education enrollment and completion of 25 years and above from the ASEAN countries were extracted for 2015 and 2020. The data provides an individual country's score. ASEAN overall status was inferred from the average score of all of the 10 ASEAN countries.

4. RESULTS

Descriptive statistics in the form of the percentage of the population were observed to identify the status of tertiary education enrollment and completion for the ASEAN-10 countries. Enrollment and completion data were extracted and presented in Table 1. The overall rate for ASEAN-10 was calculated from the mean of all nations. In addition, the general and individual country's scores are plots in Figure 2.

Overall, 17.76% of the female population in ASEAN countries enrolled in tertiary education in 2020. It is a slight increment from the previous five years with +2.24%. Consistently across 2015-2020, the highest female population enrolled in tertiary education is in Singapore, followed by the Philippines, Malaysia, Thailand, Brunei, Indonesia, Laos, Myanmar, Vietnam, and Cambodia. However, in terms of enrollment, there are differences in ranking from 2015 to 2020. Although Singapore is still leading with the most significant improvement of +7%, Malaysia (+3.8%), Laos (+3.4%), and Thailand (2.7%) fare better than the Philippines (+1.8%). Closely matching the Philippines is Myanmar (+1.7%) and followed by Brunei (+0.9%). Both Indonesia and Vietnam are estimated to have similar increment rates (+0.6%). Cambodia is the only country that shows a decreased enrollment rate (-0.1%).

In terms of completion rate, Thailand (13.6% - 16.5%) recorded better completion rate than Philippines (8.4% - 8.4%) and Malaysia (6.8% - 7.9%) for both in 2015 and 2020, but still behind Singapore (38.8% - 44.8%). This is followed by Brunei (6.9% - 7.5%), Laos (4.2% - 6.3%), Indonesia (5.0% - 5.3%), Myanmar (3.8% – 4.8%), Vietnam (4.0% – 4.3%), and Cambodia (1.2% - 1.2%). Except for the Philippines and Cambodia, the other eight countries recorded an increment in the percentage of the female population who completed their tertiary education. Compared to the overall ASEAN score, the completion rate of tertiary education for Malaysia and the Philippines is meager, with less than <30% of females who enrolled in tertiary education completed their study. In comparison, other countries recorded more than 60% completion rate ranging from 62% (i.e., Vietnam, Laos, & Myanmar) to as high as 84% (i.e., Singapore).

The female population's enrollment and completion percentage compared to the respective country's overall population does not indicate a significant difference. For most countries, the portion of the female population is reflective or closely similar to the general population percentage for both indicators across 2015 and 2020. In fact, the female population in Singapore, Thailand, the Philippines, and Laos demonstrated a higher enrollment and completion percentage than their respective countries' populations in 2020.

Table 1: Percentage of Population Enrolled for Tertiary Education in ASEAN countries

		Tertiary Education							
		2015				2020			
		Enrollment		Completed		Enrollment		Completed	
Malaysia	Population	22.6		7.7		26.5		8.9	
	Female	23.0		6.8		26.8		7.9	
Indonesia	Population	8.0		5.0		8.1		5.0	
	Female	7.9		5.0		8.5		5.3	
Singapore	Population	46.9		39.5		52.0		43.6	
	Female	45.9		38.8		52.9		44.8	
Brunei	Population	11.1		6.9		12.7		7.8	
	Female	11.0		6.9		11.9		7.5	
Thailand	Population	14.8		12.1		17.2		14.7	
	Female	16.3		13.6		19.0		16.5	
Vietnam	Population	6.8		4.3		7.4		4.6	
	Female	6.3		4.0		6.9		4.3	
Philippines	Population	27.4		7.6		29.7		8.1	
	Female	30.2		8.4		32.0		8.4	
Cambodia	Population	3.1		1.9		2.8		1.7	
	Female	1.9		1.2		1.8		1.2	
Laos	Population	6.8		4.2		8.6		5.3	
	Female	6.7		4.2		10.1		6.3	
Myanmar	Population	10.6		6.5		13.9		8.5	
	Female	6.0		3.8		7.7		4.8	
ASEAN	Population	15.81		9.57		17.89		10.82	
	Female	15.52		9.27		17.76		10.7	

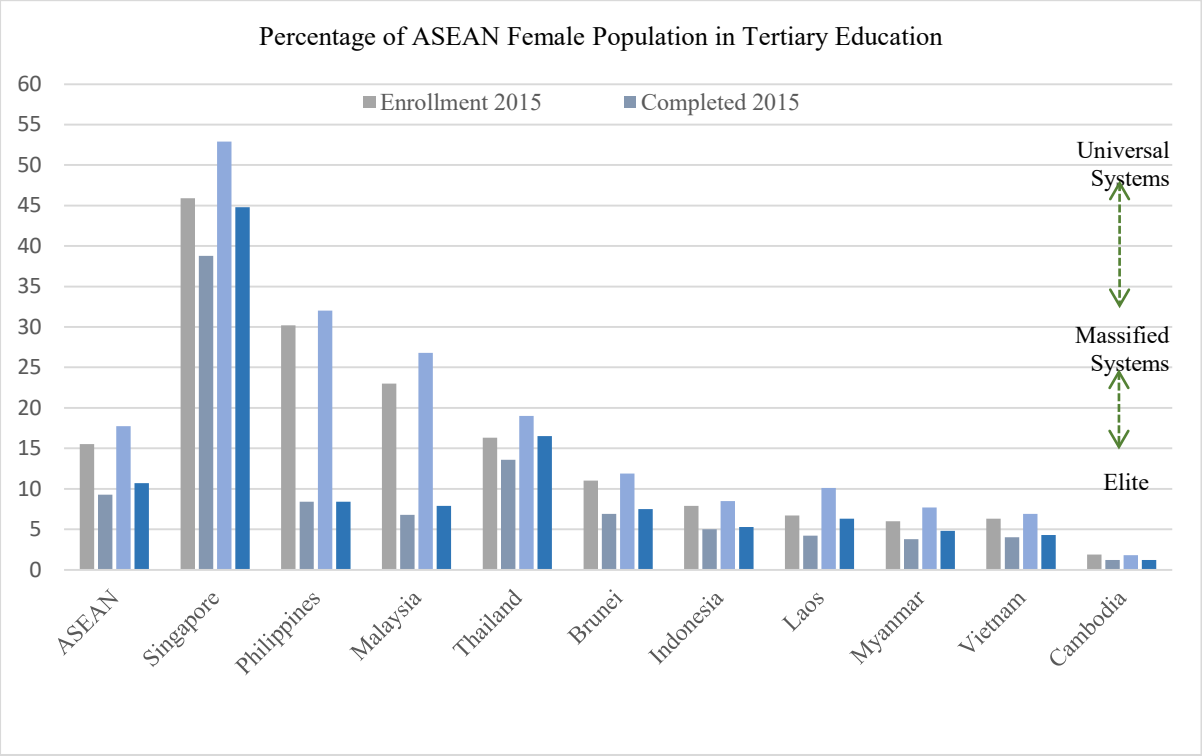

Figure 2: Percentage of Population Enrolled for Tertiary Education in ASEAN countries

5. DISCUSSION

This study observes the descriptive statistics of Barro-Lee Educational Attainment Dataset to identify the status of female tertiary education enrollment and completion for the ASEAN-10 countries. Overall, the female enrollment rate in ASEAN is less than 20%. Singapore, the

Philippines, and Malaysia recorded more than 50% than the overall ASEAN rate. On the other hand, six of the countries recorded enrollment rates below the average ASEAN score. This finding requires serious attention from individual country's authority and the ASEAN as there are more than 80% of the female population in the majority of ASEAN countries did not enroll in tertiary education. These countries are losing the potential contribution of the female population towards educational, economic, and social development [6].

The individual country's enrollment rate indicates that ASEAN countries consist of all three types of tertiary education systems from Trow's theory [18]. Figure 1 suggests that Singapore has moved to a universal design with an enrollment rate of 52%. Malaysia, Thailand, and the Philippines are the three countries with massified systems. And the remaining six countries are under the elite systems. Except for Cambodia, there was an increased enrollment pattern across all nine ASEAN countries. However, these rates still lag far behind the world enrollment rates [5].

The patterns of enrollment rate in the ASEAN tertiary education are slightly different from the world trend. Singapore is following the world trend with a more than 50% enrollment rate for the high-income countries. The same case for Malaysia, the Philippines, and Thailand, which are following the trend of middle-income countries. A similar scenario can be seen for the three lower-income countries. However, the exact inference could not be made for Brunei, Indonesia, and Vietnam. Brunei is one of the high-income countries but demonstrates an enrollment rate closer to the least developed countries. Similar to Indonesia and Vietnam, which are middle-income countries, their enrollment rates reflect the rate for the lower-income countries. Even though there was a general increment of enrollment rate across all ASEAN countries, the population percentage enrolled in tertiary education is far inferior to the world status. Singapore (i.e., 50%), for example, recorded far lower than 70% reported by the world high-income countries.

The overall female population completed their tertiary education reflects the enrollment rates in terms of completion rate. Indeed, the general completion rate for all ASEAN countries demonstrated a better trend compared to the completion rate throughout the world [19]. The majority of the countries recorded completion rates of more than 60% of the female population enrolled for tertiary education. However, there are severe concerns for Malaysia and the Philippines, whereby their completion rate indicates that less than 30% of the female population who enrolled in tertiary education completed their study—indicating a dropout rate of more than 70%. These two countries demonstrate a lower completion rate than the rest of ASEAN countries and trail behind the rest of the world [19].

Observation on the enrollment and completion rates across all ASEAN countries found no indication of the issue of the gender gap. On the other hand, the status of the female population is reflective of the overall population rates. The enrollment and completion rates for Singapore, Thailand, the Philippines, and Laos are relatively higher than their country's population rates. This is consistent with the majority of the western countries, including the United States and OECD's countries [12].

6. CONCLUSION

This study acknowledged that the use of the Barro-Lee Educational Attainment Dataset might incur criticisms. Although this database has been used by UNESCO to estimate educational attainment status across countries, it can still be further improved. It is recommended for future studies to cross-validate the data with the respective country's internal data source.

In conclusion, the Barro-Lee educational attainment dataset for 2015-2020 indicates a progressing trend in female enrollment and completion of tertiary education across ASEAN-10 countries. Furthermore, this study found that the issue of the gender gap in the registration and completion of tertiary education is not apparent in the ASEAN region. However, the overall female involvement in tertiary education is still relatively low compared to other countries around the world.

AUTHORS' CONTRIBUTIONS

Mohd Ferdaus Harun – Conceptualization – Data Collection – Analysis – Writeup
Amalina Ibrahim – Conceptualization – Review – Proofread

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