A Comparative Study of National Policy on Information and Communication Technology for Global Educational Excellence and ASEAN Countries
การศึกษาเปรียบเทียบนโยบายชาติด้านเทคโนโลยีสารสนเทศและการสื่อสาร เพื่อความเป็นเลิศทางการศึกษาระดับโลกและประเทศสมาชิกอาเซียน

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บทคัดย่อ

บทความวิจัยนี้ มีวัตถุประสงค์เพื่อศึกษาเปรียบเทียบประเด็นร่วมนโยบายชาติด้านเทคโนโลยีสารสนเทศและสื่อสารเพื่อการศึกษาระหว่างประเทศเป็นเลิศระดับโลกกับประเทศอาเซียน โดยเทียบเคียงจากการจัดอันดับประเทศที่มีการจัดระบบการศึกษาที่ดีที่สุดของโลกประจำปี 2014 ประกอบไปด้วย 5 ประเทศได้แก่ เกาหลี ญี่ปุ่น สิงคโปร์ ฮ่องกงและฟินแลนด์ จากการศึกษาวิเคราะห์เปรียบเทียบข้อมูลเอกสารพบว่า ประเด็นหลักของนโยบายชาติด้านเทคโนโลยีสารสนเทศและการสื่อสารเพื่อการศึกษาในทุกประเทศจะต้องมีประกอบด้วย 1) การพัฒนาโครงสร้างพื้นฐาน 2) การพัฒนาเทคโนโลยีสารสนเทศและการสื่อสารเพื่อการศึกษาสำหรับเด็กก่อนวัยเรียนและการศึกษาขั้นพื้นฐาน 3) การศึกษาภาคบังคับและอาชีวศึกษา 4) อุดมศึกษา 5) การพัฒนาครูมืออาชีพ 6) การวิจัยและพัฒนาทรัพยากรมนุษย์ด้านเทคโนโลยีสารสนเทศขั้นสูง และ 7) ความปลอดภัยในโลกไซเบอร์ตามลำดับ

คำสำคัญ: นโยบายชาติด้านเทคโนโลยีสารสนเทศและสื่อสาร, ความเป็นเลิศทางการศึกษาระดับโลก

Abstract

The objective of this research was to study the issues, similarities and differences between the national policies on information and communication technology for global education in the countries of excellence and ASEAN countries. The countries with the best education systems in the world in 2014 were: Korea, Japan, Singapore, Hong Kong, and Finland. Studies found that the

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National policies on information and communication technology for educational excellence include: 1) Infrastructure development for ICT, 2) Development of ICT for early childhood education and basic education, 3) compulsory and vocational education, 4) higher education, 5) professional teacher development, 6) research and highly-skilled digital human resource development, and 7) cyber security, respectively.

Keywords: The policy of Information Technology and Communication, Global Educational Excellence

1. Introduction

It is essential to develop the information and communication technology policy for the education of all countries. The developed countries or the poorest countries need Information and Communication Technology for Education because of it is the important tool in the human resources development (Trucano, 2016: 23) The Association of Southeast Asian Nation (ASEAN)'s e-ASEAN Framework Agreement has established an e-Society, and strengthened their ability to reduce the differences between the digital and member states by proposing projects such as ASEAN Educators Online, ASEAN Infonet, ASEAN SchoolNet, e-Entrepreneurship, ASEAN Incubator Project, ArtPortalAsia.com, ASEAN University, and Cyber University to connect education with the member countries. (Association of Southeast Asian Nation, 2015: 15-48) There is an accreditation of educational qualifications between each member country to build the trust with the students in the region and to constantly take the advantage of the evolving information technology growth. As a result, ASEAN countries had been preparing for many areas to enter the electronic community since 2015. These countries developed policies, strategies and strategies in various areas, especially educational policies related to education, information technology and communication. These are for the human resources development to be used for driving the sustainable country development in the future. Then, each ASEAN member country must find out the ways to find out the information and communication technology policy for educational development. This is consistent with the development plan of the

ASEAN Member States as well. The results of the finding lead in integration for developing global education in the countries of excellence and ASEAN countries. The country is world class excellence such as; Korea, Japan, Singapore, Hong Kong, and Finland. (Coughlan, S., 2014: 1)

2. The Objectives of the Studies

The objective of this research was to study the issues, similarities and differences between the national policies on information and communication technology for global education in the countries of excellence and ASEAN countries.

3. Research Methodology

The researcher applied the research processes from Chanthavanich, (2009) and Lincharoen, (2011: 17-29) to select the data and points focusing on the information and communication technology for education policy with these following steps.

Step 1: analyze the sources of the data and choose date from the world-class excellent countries. The criteria used for selecting the data was developed from Boonying (2017: 1- 43) and Chanpeng (2010: 22-41). After selecting the data, it could be concluded as: 1) consideration announced document as the policy of educational or national governmental organizations was important to the information and communication technology for education, and 2) consideration up-to-date and produced date during 2014-2019 was conducted.

Step 2: classify the set of data onto the table in order to analyze the relationship and consistency of the data related to the related focusing points.

Step 3: classify the events from the classified data.

Step 4: choose the process similar and consistent data to find the joined identity or characteristics in the same points.

Step 5: choose the key point events affected the information and communication technology for education.

Step 6: analyze the certainty of the documents and searched all online publications from reliable government agencies, and

Step 7: repeat validation with a seminar process of 8 educational technology experts.

According to the seven steps mentioned above, the researcher could analyze the points and got 7 issues on the information technology and communication for global excellence education specified in the table 1 below got from 5 countries; Korea (KR) (White Paper on ICT in Education Korea, 2015) Japan (JP) (i-Japan Strategy, 2015), Singapore (SG) (iN2015) Hong Kong The Fourth Strategy on Information Technology in Education (ITE4), and Finland (FI) (Ministry of Education Finland. (2015).

Table 1: The results of the comparative analysis on issues of the national policy on information technology and communication for global excellence education:

Key common issues	Sub-issues of global excellence				
	KR	JP	SG	HK	FI
1. Infrastructure Development	***	**	*	**	
2. ICT Development for Early Childhood Education and Basic Education	****	*	****	****	******
3. Compulsory and Vocational Education			***	**	****
4. Higher education	*****	**			**
5. Professional Teacher Development	*		*****	**	**
6. Research and Highly-Skilled Digital Human Resource	*	******* ******	**	*	**
7. Cyber Security	****	*	**	*	

The next process was to study and analyze the national policy on information and communication technology for the study of ASEAN member countries through the information and communication technology policies for education of 9 ASEAN member countries specifying in the following table 2.

Table 2: The sources of documents used for the analysis of information and communication technology policies for education of 9 ASEAN member countries.

Country	Documents
Malaysia (MY)	MALAYSIA EDUCATION BLUEPRINT 2013- 2025 (Ministry of Education Malaysia, 2013, UNESCO, 2013)
Indonesia (ID)	Indonesia Perkiraan Kebutuhan Anggaran di Kementerian Pendidikan dan Kebudayaan Tahun 2015 – 2019 (Ministry of Education and Culture Indonesia, 2015, UNESCO, 2013)
Thailand (TH)	Thailand Information and Communication Technology Policy Framework 2011-2020 (Ministry of Information and Communication Technology, 2011, UNESCO, 2013)
Brunei (BN)	The Ministry of Education Strategic Plan 2012 – 2017 (Ministry of Education Brunei, 2012, UNESCO, 2013)
Vietnam (VN)	White Book of Viet Nam Information and Communication Technology 2017 (Ministry of Education and Training Vietnam, 2017, UNESCO, 2013)
Myanmar (MM)	National Education Strategic Plan 2016-21 Summary (Ministry of Education Myanmar, 2016, UNESCO, 2013)
Philippines (PH)	Philippine Education for All 2015 Assessment (Department of Education Philippines, 2015, UNESCO, 2013)
Cambodia (KH)	MASTER PLAN FOR INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION, (Sok Tha, 2009, UNESCO, 2013)
Laos (LPD)	UNESCO, (2013) ICT in Education Policies, Infrastructure and ODA status selected ASEAN Countries. Published by UNESCO Bangkok. Asia and Pacific Regional Bureau for Education Mom Luang Pin Malakul Centenary Building 920 Sukhumvit Road, Prakanong, Klongtoey Bangkok 10110, Thailand.

According to the above table, it was found that Singapore is one of the world class excellence countries. The adoption of the Information and Communication Technology Policy for Education of some ASEAN member countries had not been formally reviewed and/ or published during the study of the information contained in this paper.

4. Results

The results of this study were to compare the issues, similarities and differences between the national policy on information and communication technology for the global education excellence and ASEAN countries in each area, as shown in table 3:

Table 3: Infrastructure Development

Sub-issues of global excellence	ASEAN								
	BN	KH	ID	LPD	MY	MM	PH	TH	VN
1. Creating infrastructure for public information and healthy cyber culture	✓		✓		✓		✓	✓	✓
2. Regional development using information and communications infrastructure	✓								
3. Connected ICT learning ecosystem	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Enhancing schools' IT infrastructure	✓		✓		✓		✓	✓	✓
5. Additional infrastructure, laws, and systems	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Sustaining a coherent development of IT in Education	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Contributions to more resilient public infrastructure	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. Sustaining a coherent development of IT in education	✓	✓	✓	✓	✓	✓	✓	✓	✓

According to the table 3, it was found that the regional development using information and communication infrastructure, the rule year looks like Brunei Darussalam, a small country, was successful.

Table 4: ICT Development for Early Childhood Education and Basic Education

Sub-issues of global excellence	ASEAN								
	BN	KH	ID	LPD	MY	MM	PH	TH	VN
1. Early childhood, elementary, middle education to construct support system for customized learning	✓		✓		✓			✓	
2. Creating virtuous cycle of education information based on curriculum	✓		✓		✓			✓	✓
3. Constructing support system for creative teaching-learning activity	✓		✓		✓		✓	✓	✓
4. Reinforcing information education on training creative talents in ICT			✓		✓		✓	✓	✓
5. Enhancing the desire of children to learn and their academic abilities using methods	✓		✓		✓		✓	✓	✓

having objectively affected the Measured methods whose effects have been objectively measured.									
6. Deeper ICT Integration in Curriculum, Assessment & Pedagogy	✓		✓		✓		✓	✓	✓
7. Sustained Professional Learning	✓		✓		✓		✓	✓	✓
8. Connected ICT Learning Ecosystem	✓		✓		✓		✓	✓	✓
9. Enhancing problem-solving and programming-related skills	✓		✓		✓		✓	✓	✓
10. Applying IT skills across school curricula			✓		✓		✓	✓	✓
11 Promoting an e-learning repertoire	✓	✓	✓	✓	✓	✓	✓	✓	✓
12. Using e-assessment for student learning	✓		✓		✓		✓	✓	✓
13. Engaging students in IT-related life-wide learning	✓		✓		✓		✓	✓	✓
14. Reinforcing opportunities for learning, motivation and the joy of learning	✓		✓		✓		✓	✓	✓
15. Creating capabilities for lifelong learning	✓		✓	✓	✓		✓	✓	✓
16. Consolidating citizenship skills and cross-curricular teaching and learning.			✓		✓			✓	
17. Taking individual abilities into account in education more effectively	✓		✓		✓		✓	✓	✓
18. Diversifying language studies	✓	✓	✓	✓	✓	✓	✓	✓	✓
19. Enabling efficient use of information and communications technology	✓		✓		✓		✓	✓	✓

According to the table 4, it presented that Cambodia, Laos, and Myanmar do not appear to be specific and operational policy into action clearly.

Table 5: Compulsory education and Vocational Education

Sub-issues of global excellence	**ASEAN**								
	BN	**KH**	**ID**	**LPD**	**MY**	**MM**	**PH**	**TH**	**VN**
1. Strengthening learners' knowledge and skills to utilize information	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Increasing advanced and flexible learning opportunities			✓		✓		✓	✓	✓
3 Strengthening capabilities for further studies.	✓	✓	✓	✓	✓	✓	✓	✓	✓

4 Utilization of information technology in the matriculation examination and in the upper secondary school student assessment.	✓		✓		✓		✓	✓	✓
5. Students managing information across modes & moving seamlessly through various sources			✓		✓				
6. Students establishing networks & collaborate synchronously & synchronously in a connected environment			✓		✓		✓	✓	
7. Students tinkering, remixing & publishing digital artefacts across mode & forms	✓		✓		✓	✓	✓	✓	

According to the above table 5, the countries with outstanding development of vocational education are Indonesia, Malaysia, Thailand, and the Philippines. Vietnam has been influenced by investing in industry and technology from multinational companies. It also is in the process of developing compulsory education, secondary, and vocational education in the future to support the expansion of the upcoming IT industry. The fifth issues of the students' managing information across modes & moving seamlessly through various sources are operative in only 2 countries; Malaysia and Indonesia.

Table 6: Higher education

Sub-issues of global excellence	ASEAN								
	BN	KH	ID	LPD	MY	MM	PH	TH	VN
1. Higher education, & academic research to realize society-centered abilities	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Enhancing academic information distribution system and constructing global system network	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Reinforcing support for research, educational university activities	✓	✓	✓		✓		✓	✓	✓
4. Expanding opening and sharing utilization of university information	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Construction and operation for university informatization infrastructure	✓		✓		✓		✓	✓	✓

6. Operation of distance universities and distance university special graduate schools			✓		✓		✓	✓	✓
7. Establishing stable and ongoing structures to prevent the occurrence of mismatches with respect to highly-skilled digital human resources.			✓		✓		✓	✓	✓
8. Supporting the individual continuum of competence and self-development and console- dating key citizenship skills			✓		✓		✓	✓	✓
9. Extending careers by reinforcing recognition of prior learning and flexible transition between forms and levels of education and the world of work	✓		✓		✓		✓	✓	✓

According to table 6, it showed that many universities in Indonesia, Malaysia, Thailand, and the Philippines were ranked as top in regards to the curriculum and teaching and quality education. While higher education institutions in Vietnam are developing rapidly, each part is funded by development partners in the private sector.

Table 7: Professional Teacher Development

Sub-issues of global excellence	**ASEAN**								
	BN	**KH**	**ID**	**LPD**	**MY**	**MM**	**PH**	**TH**	**VN**
1. Teacher competence development support project	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Teachers as designers of learning experiences and environments	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Sustained and differentiated professional learning	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. As designers of learning experiences teachers bring about engaged learning through transformative use of technology	✓		✓		✓		✓	✓	✓
5. Teachers are equipped with skills to be designer of learning. Middle managers & school leaders going through milestone courses to be instructional leaders of technology to guide the school	✓		✓		✓		✓	✓	✓
6. Innovative ICT-based pedagogical practices that empower teachers in	✓		✓		✓		✓	✓	✓

designing learning experiences & environments									
7. Sharing of resources by teachers	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. Enhancing professional development of teachers	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Developing the competences of teaching personnel	✓	✓	✓	✓	✓	✓	✓	✓	✓
10. Reinforcing openness and educational partnerships	✓	✓	✓	✓	✓	✓	✓	✓	✓

According to table 7, it presented commitment to the development of teacher personnel for each country in ASEAN. It is a challenge for Laos, Cambodia, and Myanmar, but the teaching profession is still the profession that young people of Laos and Cambodia have the most ambition to pursue a career.

Table 8: Research and Highly-Skilled Digital Human Resources

Sub-issues of global excellence	**ASEAN**								
	BN	**KH**	**ID**	**LPD**	**MY**	**MM**	**PH**	**TH**	**VN**
1. Sharing and circulation of research information	✓		✓		✓		✓	✓	✓
2. Promoting research and development strategies	✓		✓		✓		✓	✓	✓
3. Enhancing research and development to realize cutting-edge ICT in all parts of society	✓		✓		✓		✓	✓	✓
4. Promoting research and development into next- generation optical network technologies	✓		✓		✓		✓	✓	✓
5. Promoting research and development and pilot programs of multilingual voice-based translation technology	✓		✓		✓		✓		✓
6. Promoting research and development of AI-related technologies			✓		✓			✓	
7. Construction and application of testbeds to accelerate the public implementation of research findings			✓		✓			✓	
8. ICT Innovation creation challenge program			✓		✓			✓	✓
9. Research and development programs promoting international collaborations in the ICT field	✓		✓		✓		✓	✓	✓

10. Human resources who can create new technologies and innovations.	✓		✓		✓		✓	✓	✓
11. Human resources with the architectural and system design skills to build large-scale and complex information systems and software			✓		✓		✓	✓	✓
12. Human resources having the project management capabilities to make highly complex information systems and software easy to use and reliable.			✓		✓		✓	✓	✓
13. Information security human resources with advanced knowledge			✓		✓		✓	✓	
14. Promoting programming education		✓		✓		✓	✓	✓	
15. Translating research findings into classroom practices & learning design principles			✓		✓		✓	✓	✓
16. Spreading successful practices for adoption & adoption across school			✓		✓		✓	✓	✓
17. Empowering e-leadership	✓		✓		✓		✓	✓	✓
18. Supporting informed decision-making through national and international research, statistical and assessment data			✓		✓				
19. Excellent expertise Motivating leadership committed personnel Effective guidance			✓		✓		✓	✓	✓

According to table 8, it didn't have information found in the implementation of the policy on the process of developing research and development of human resources in advanced digital skills in Brunei, Laos, Cambodia, and Myanmar. Meanwhile, Malaysia, Indonesia, Thailand, Philippines, and Vietnam have had information on the continuous development of high-tech human resource research and development policies.

Table 9: Cyber Security

Sub-issues of global excellence	**ASEAN**								
	BN	KH	ID	LPD	MY	MM	PH	TH	VN
1. Creating safe and healthy cyber culture	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Creation of healthy cyber culture	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Protection of personal information and information security	✓	✓	✓	✓	✓	✓	✓	✓	✓

4. Promoting cybersecurity	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Responsible digital learning	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Using mobile devices wisely	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Development of learning culture	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. Integrating cyber wellness lessons into the character and citizenship, education curriculum, & complementing with various school-wide programmers in all schools	✓	✓	✓	✓	✓	✓	✓	✓	✓

According to table 9, it presented about cybersecurity. This is a global agenda in which all countries of the world are aware of all sensitive dimensions. These may have implications on culture, society, economy, and politics with both inside and outside country.

The overall results of the analysis of information and communication technology policies for education in ASEAN countries showed the issues, similarities, and differences with the countries of Global Excellence. All countries have tried to push the policy to be universal as possible as. However, all policies are not successfully implemented as they should be because policy implementation is a plan for future operations. These may change at any time. The policy development, information technology, and communication for education in some countries in ASEAN such as Cambodia, Laos, and UNESCO have a joint role in planning the development of information and communication technology policies for education with local governments using database from research studies. These become the important and important tool for developing policy guidelines. However, it is worth noting that overall policy operations remain a challenge for these countries. The most policy development aims at improving the quality of life of the people as a whole except Myanmar. This country hasn't found inequality, and also the people in these country lacks of educational opportunities for borderline minorities.

5. Conclusion and Discussion

Comparing the policy development, information and communication technology for education for ASEAN countries to the national issues of global excellence, it found that Myanmar still have problems with the development

of the national education policy affected border minorities because they are very difficult to unite as the group. Laos and Cambodia are focusing on policy mainly to enhance the economic base of the public. The development of national education as a whole is aided by international organizations, especially UNESCO plays an important role in the educational development for these two countries. Philippines and Indonesia have an island landscape developing an information and communication technology policy for education. They are more challenging than in any other country in ASEAN countries especially the development of information and communication technology infrastructure. However, this policy for the Philippines and Indonesia still have a promising approach, and it is close to international success because most of the education management is based on international languages. The course of development of Indonesia's robots would cause a rapid educational development. According to the information appearing in Malaysia and Brunei, it was found that the development of information and communication technology for education, these 2 countries are attentive in the ASEAN region because they are readily available in all dimensions especially infrastructure development, information technology, strong communication, and a long stability of national policies. The policy implementation plan can be carried out in accordance with the development direction continually. The development of Vietnam is followed by many dimensions of Thailand in the past. Today, Vietnam has become an important trade and investment competitor. The part of the achievement enabled Vietnam to upgrade the country's economy. This case leads in raising education to its current development due to the continued relocation of digital technology industries investment in Vietnam especially in the global electronics and digital technology industries. Vietnam is determined to develop human resources and to urgently enter the labor market in the industry.

Thailand's issues in developing the national education system including of policy development, information technology, and communication for education as a whole showed that development coupled with the unstable political change because of uncertainty in the implementation of various

policies. The national strategy for education is modified frequently. The weakness of Thai education must overcome in order to keep pacing with technology and information. Additionally, it was found that there are significant differences between public and private educational institutions regarding the extent of information and communication technology for education in Thailand. This is believed that Thailand's parallel economic development will help to create the wealth from the existing legacy to invest heavily in technology-based education systems as an important knowledge base.

Information and Communication Technology Policy for Education of each ASEAN Country. It is possible, in theory, is the expectation. But there are many factors, such as challenges. Political instability and economic conditions. Next study. The study compared the development of the 9 issues depth on the table that appears.

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