

Status of ICT Integration in Education in Southeast Asian Countries*

By Bunyamin Maftuh**

A. Introduction

1 In the globalization era of the 21st century, the world has changed so fundamentally which is mainly ignited by rapid development of information and communication technologies (ICT). The ICT refers to various technologies, tools and devices that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes technologies such as computers, radio, television, video, CD, DVD, telephone (both fixed line and mobile phones), PDAs, satellite systems, network hardware and software, and the equipment and services associated with these technologies, such as video conferencing, e-mail, and blogs.

2 Rapid development of ICT has encouraged people who live in this century to develop and improve their competency in ICT literacy as well as information and media literacy. As stated by Thrilling and Fadel (2009) people who live in the 21st century must have the following skills: critical thinking and problem solving, communication and collaboration, creativity and innovation, information literacy, media literacy, ICT literacy, flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability, leadership and responsibility.

3 The fundamental changes in the 21st century, according to Thrilling and Fadel (2009: xxviii), will change the roles of learning and education in day-to-day living. In this relation, rapid development of ICT in this century provides great opportunities for its use in education. Some experts state that integrating ICT in education provides opportunities for students to search for and analyse information, solve problems, communicate and collaborate and hence, equips them with a set of competencies to be competitive in the 21st century marketplace (Bereiter & Scardamalia, 2006; Fullan, Hill, & Crévola, 2006; Jonassen, Howland, Marra, & Crismond, 2008). The integration of ICT in education will provide promising expectation for improving the quality of education.

4 The Southeast Asian Ministers of Education Organization (SEAMEO) recognizes and gives high attention on the importance of ICT in education. As an initial step towards knowledge sharing of ICT practices and experiences, SEAMEO assigned SEAMEO Secretariat and SEAMEO Regional Centre for Vocational and Technical Education (SEAMEO VOCTECH) to conduct a preliminary survey on the status of ICT integration in education in the 11 SEAMEO Member Countries namely Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Leste and Vietnam.

* Presented at Tsukuba International Conference: Innovation of Classroom Teaching and Learning through Lesson Study, Tsukuba University, Japan, and 17-20 February 2011.

** Programme Officer II, the SEAMEO Secretariat, Bangkok, Thailand.

B. Focus and Methodology of Survey

5 ICT integration here is interpreted as ICT which functions as an integral or mediated tool to accomplish specific teaching or learning activities to meet certain instructional objectives. For ICT to be effectively integrated in schools, it is used as a mediated tool in these activities to engage students in higher order thinking. Higher order thinking skills are goal-directed strategic processes that include analyzing, evaluating, hypothesizing, elaborating and synthesizing. And engagement entails mindfulness, cognitive effort and attention of the students in the teaching and learning activities (Lim, 2007).

6 As the process of ICT integration in education has reached a considerable level of maturity and stability in some countries in Southeast Asia, the pertinent questions of the survey are:

- a) How has ICT been integrated in education among the countries in Southeast Asia?
- b) What are the strengths and capacities of these countries to integrate ICT in education?
- c) What are the ICT-in-education best practices in these countries and how can they be shared among the countries in Southeast Asia?

7 Based on these main questions, the SEAMEO Secretariat together with SEAMEO VOCTECH in Brunei Darussalam developed a set of guiding questions for countries to prepare a case study to identify the state of ICT integration in their respective countries. Ten ICT-in-education dimensions are identified based on the country case studies where these dimensions are necessary and sufficient conditions that support the integration of ICT in education.

8 The ten ICT-in-education dimensions are as follows:

1. National ICT-in-education vision;
2. National ICT-in-education plans and policies;
3. Complementary national ICT and education policies;
4. ICT infrastructure and resources in schools;
5. Professional development for teachers and school leaders;
6. Community/partnerships;
7. ICT in the national curriculum;
8. Teaching and learning pedagogies;
9. Assessment; and
10. Evaluation and research.

9 In order to make sense of the differences and commonalities among the countries, regions and areas, countries were required to map out their ICT integration development based on the following four stages of ICT-in-education adopted from UNESCO's model of ICT Development in Education (UNESCO, 2005).

- **Emerging** - Those who have just started their ICT-in-education journey;
- **Applying** - Those who have developed a new understanding of the contribution of ICT to learning;
- **Infusing** - Those who have integrated ICT into existing teaching, learning and administrative practices and policies; and
- **Transforming** - Those who have used ICT to support new ways of teaching, learning and administration.

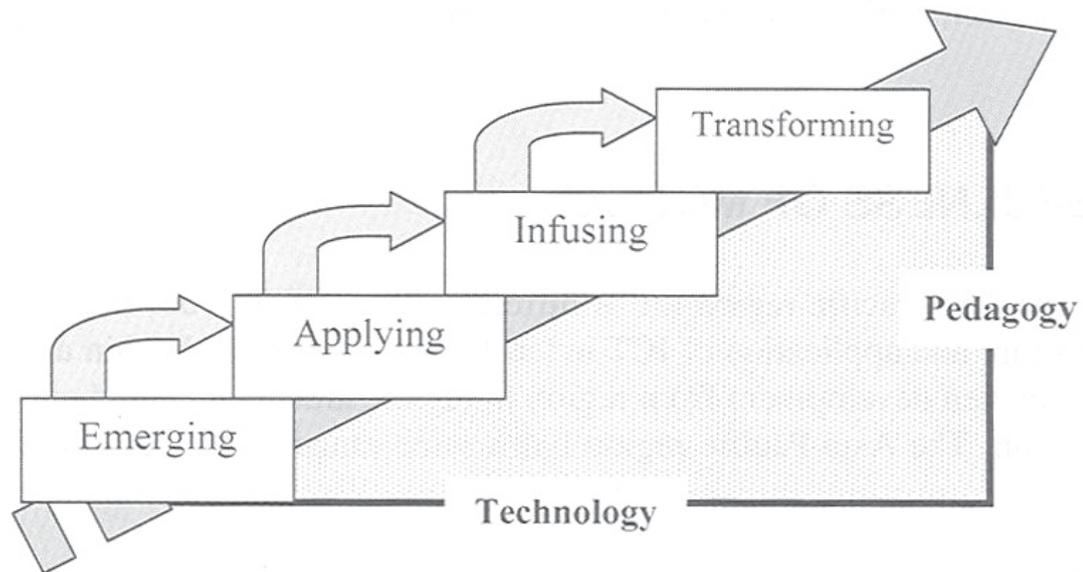


Figure1. Stages of ICT Integration in Education

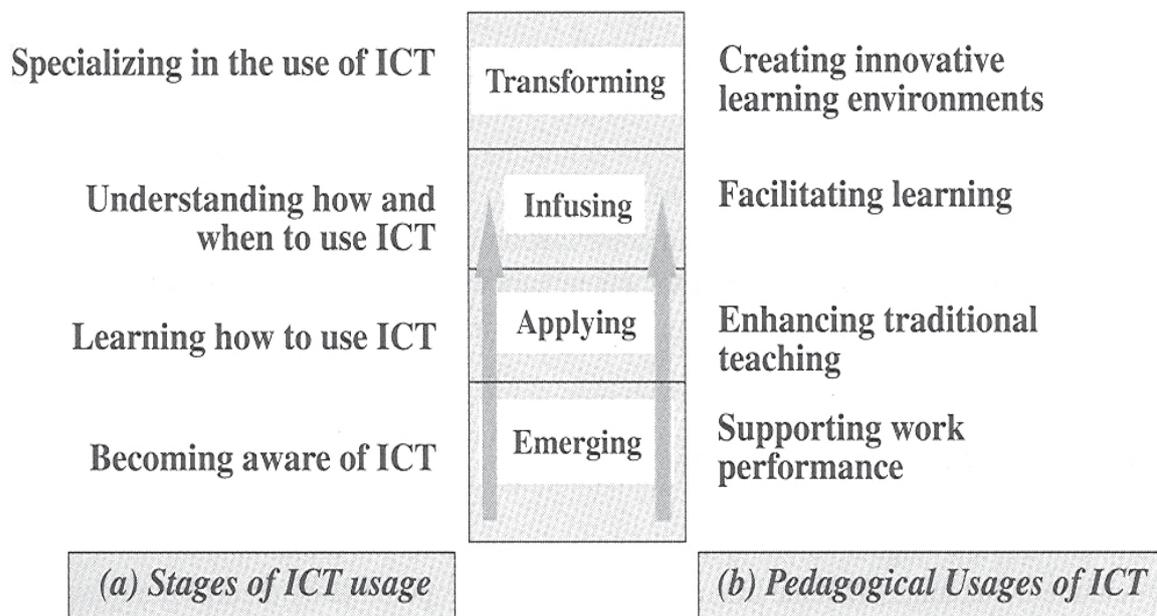


Figure 2. Mapping the Model

10 The results of this study were based on the information that has been extracted from the self-reporting case studies and self-assessment of the stages of ICT in education of the countries. These case studies and assessments were prepared by the representatives of the Ministry of Education from each country.

C. Southeast Asian Countries' Stages of ICT in Education

11 The Southeast Asian region is very diverse in terms of geographic, demographic, economic, educational and cultural factors. Consequently, the 11 SEAMEO Member Countries are at very different stages of integrating ICT in education. There are countries that are already at or moving towards the transforming stage and there are countries that have just started out and at the emerging stage of ICT-in-education. Based on these different stages of development, the countries may be categorised into three groups. It is important to note that besides the differences of ICT-in-education development among the three groups, there are also differences among the countries within each group.

12 Table 1 below provides an overview of the SEAMEO Member Countries stages of ICT-in-education in all ten dimensions of necessary and sufficient conditions that support the integration of ICT in education.

Table 1: Overview of SEAMEO Member Countries' Stages of ICT Integration in Education

ICT in Education Dimensions	Stages of ICT Integration in Education*			
	Emerging	Applying	Infusing	Transforming
1. National ICT in Education Vision	Lao PDR; Timor Leste	Cambodia; Myanmar	Brunei and Vietnam (Towards Transforming); Indonesia; Philippines; Thailand	Malaysia; Singapore
2. National ICT in Education Plans & Policies	Lao PDR; Timor Leste	Cambodia; Myanmar	Indonesia; Philippines; Thailand	Brunei; Malaysia; Singapore; Vietnam
3. Complementary National ICT & Education Policies	Lao PDR; Timor Leste	Cambodia; Myanmar	Indonesia; Philippines; Thailand	Brunei; Malaysia; Singapore; Vietnam
4. ICT Infrastructure & Resources in Schools	Cambodia; Indonesia; Lao PDR; Philippines; Timor Leste	Cambodia; Indonesia; Philippines; Myanmar	Malaysia; Thailand; Vietnam	Brunei; Malaysia; Singapore; Thailand; Vietnam
5. Professional Development for Teachers & School Leaders	Lao PDR; Timor Leste	Cambodia; Indonesia; Myanmar	Malaysia; Philippines; Thailand; Vietnam (Towards Transforming)	Brunei; Singapore

	Stages of ICT Integration in Education*			
ICT in Education Dimensions	Emerging	Applying	Infusing	Transforming
6. Community/ Partnership	Lao PDR; Timor Leste	Brunei; Cambodia; Indonesia; Myanmar	Philippines; Thailand; Vietnam	Malaysia; Singapore
7. ICT in the National Curriculum	Cambodia; Lao PDR; Timor Leste	Indonesia; Myanmar; Philippines; Thailand	Brunei; Malaysia; Singapore (Towards Transforming); Vietnam	
8. Teaching & Learning Pedagogies	Cambodia; Indonesia; Lao PDR; Myanmar; Timor Leste	Cambodia; Indonesia; Malaysia; Myanmar; Thailand; Vietnam	Brunei (Towards Transforming); Indonesia; Malaysia; Philippines; Thailand; Singapore; Vietnam	Malaysia; Singapore; Vietnam
9. Assessment	Cambodia; Indonesia; Lao PDR; Myanmar; Philippines; Timor Leste	Thailand; Vietnam	Brunei; Malaysia; Singapore	
10. Evaluation & Research	Cambodia; Lao PDR; Philippines; Timor Leste	Indonesia; Thailand; Myanmar	Brunei (Towards Transforming); Malaysia; Vietnam	Singapore

*Reference: Regional Guidelines on Teacher Development for Pedagogy-Technology Integration, UNESCO and Asia-Pacific Programme of Educational Innovation for Development, 2005.

*Note : *In dimensions 4 (ICT Infrastructure & Resources in Schools) and 8 (Teaching & Learning Pedagogies), some of the countries appear in more than one stage of ICT in education due to the differences in stages of development among the provinces or areas within each of these countries.*

13 From Table 1 it is clear that the 11 SEAMEO Member Countries are at very different stages of integrating ICT in education. There are countries that are already at or moving towards the transforming stage and there are countries that have just started out and at the emerging stage of ICT in education. Based on these different stages of development, the countries may be categorised into three groups (figure 3). It is important to note that besides the differences of ICT-in-education development among the three groups, there are also differences among the countries within each group.

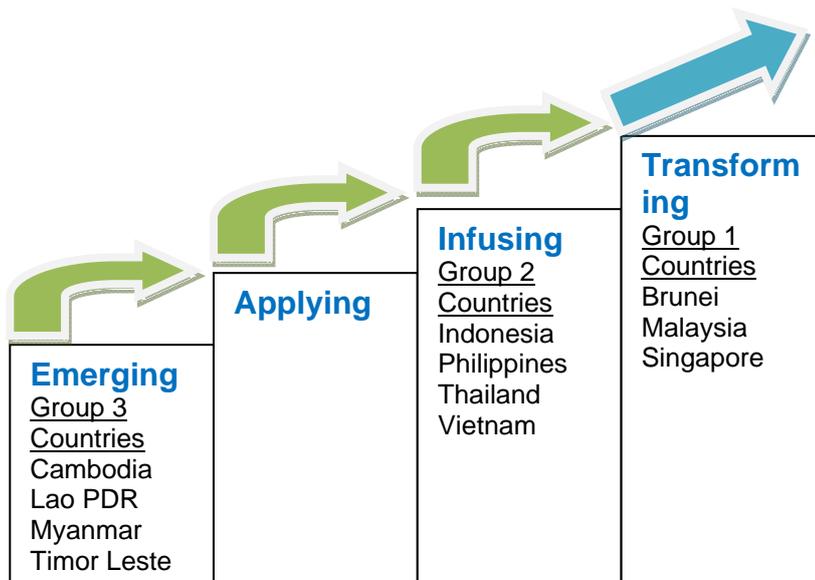


Figure 3. Three Groups of SEA Countries in the Stage of ICT integration

- **Group 1 countries:** Brunei Darussalam, Malaysia, and Singapore.

14 All three countries have highly developed national ICT-in-education plans and policies that are integral to the overall education development or improvement plans. These plans and policies complement the national ICT and education policies, where the policies inform and support one another.

15 Almost all the classrooms in these three countries (except in the less developed areas in Malaysia), having been equipped with computers and other ICTs, have a high student-computer ratio, a high level of Internet access to all schools and an education delivery system that is increasingly online.

16 These countries are at the infusing and transforming stages for most of the dimensions of ICT in education. In this group, Malaysia and Singapore are much further ahead on the ICT-in-education journey than Brunei, especially in the dimensions of teaching and learning pedagogies and community/partnership.

- **Group 2 countries:** Indonesia, Philippines, Thailand, and Vietnam.

17 These countries are mainly at the infusing stage for most of the dimensions and most of them already have developed ICT plans and policies in education. But due to the rural-urban gap, there are still some parts of the dimensions that are in the applying and even emerging stage. For example, under the teaching and learning pedagogies dimension, Indonesia's stages of development range from emerging in the less developed provinces to infusing in the more developed provinces; and in the case of Vietnam, the stages range from applying to transforming.

18 Among the countries in this group, Thailand and Vietnam are in more advanced stages of ICT-in-education than Indonesia and Philippines.

- **Group 3 countries:** Cambodia, Lao PDR, Myanmar, and Timor Leste.

19 Although each of these four countries has either started to develop and implement ICT in education plans and policies or implemented ICT-in-education projects on a small scale, all of them are still at the emerging stage for most of the dimensions. The main concern of these countries is access to ICT infrastructure, hardware and software.

20 In this group, Cambodia and Myanmar are at more advanced stages of ICT-in-education than Lao PDR and Timor Leste. The former countries are at the applying stage from the dimensions of national ICT-in-education vision, plans and policies, complementary national ICT and education policies and ICT infrastructure and resources in schools, whereas the latter countries are at the emerging stage for these dimensions.

D. Conclusion and Emerging Issues

21 The ten dimensions of ICT-in-education have allowed us to document and compare the stages of ICT-in-education among the 11 SEAMEO Member Countries based on their self-reported case studies. The results of the comparative study inform policymakers, school leaders, and teachers about how to take up the opportunities and address the limitations of ICT, and how to effectively integrate ICT in schools and their broader socio-cultural contexts. By drawing upon the similarities and differences of the dimensions that facilitate or hinder the integration process among countries, the results of the study will add to the body of research knowledge and theory about the contexts and factors that contribute to the effective integration of ICT in education.

22 Some schools among the Group 1 countries are in the transforming stage or moving towards the transforming stage of ICT-mediated teaching and learning pedagogies; these pedagogies are most likely to equip students with a set of competencies to be competitive in the 21st century marketplace. For these pedagogies to be implemented in the schools of a country, the other dimensions of ICT in education have to be in the infusing or transforming stage. Singapore is in the transforming stage for all of the dimensions except the ICT in the national curriculum and assessment dimensions. None of the 11 SEAMEO Member Countries have assessed themselves to be in the transforming stage for these two dimensions. Brunei and Malaysia are in the transforming stage for most of the other dimensions except the evaluation and research dimension.

23 Among the Group 2 countries, only some schools in Vietnam are in the transforming stage of ICT-mediated teaching and learning pedagogies. The rest of the schools in Vietnam and the other three countries, Indonesia, Philippines and Thailand, are in the infusing and applying stages with the exception of Indonesia which has schools in the emerging stage. Vietnam has three dimensions of ICT in education in the transforming stage: national ICT in education plans and policies, complementary national ICT and education policies and ICT infrastructure and resources in schools; and these may have provided the necessary and sufficient

conditions for some schools to transform their ICT-mediated teaching and learning practices.

24 For the Group 3 countries, there are some schools in Cambodia and Myanmar that are in the applying stage of ICT-mediated teaching and learning pedagogies; but for the rest of the schools in Cambodia and Myanmar, and all schools in Lao PDR and Timor Leste, they are in the emerging stage.

25 From the discussion in this comparative study, six issues have emerged for the Ministries of Education of the SEAMEO Member Countries to address as a group and as a country:

1. Holistic approach towards the development of the national ICT-in-education plans and policies.
2. Provision of professional development to staff at all levels in the education system with a greater emphasis on the pedagogical aspect of ICT integration.
3. Emphasis on ICT in national curriculum and assessment.
4. Sharing and transfer of ICT in education best practices and lessons learnt among SEAMEO Member Countries, and among schools and provinces/states in the country.
5. Support of Group 3 countries' ICT in education efforts through partnerships.
6. Planning for evaluation and research of ICT in education.

26 As we move further into the 21st century, students in Southeast Asian countries must be prepared to meet the future needs of the knowledge-based economy. Students have to learn to seek out new information, think critically, and show initiative to meet the challenges of the fast-changing world. ICT in education offers such teaching and learning opportunities. This report has discussed how the ten dimensions of ICT in education support or fail to support the effective integration of ICT in schools among the 11 SEAMEO Member Countries. This account has emphasised what works and what appears right in a particular setting, and the problems encountered and addressed in a particular situation. The account provides a sample of pedagogical and policy issues that were discussed over the course of writing this report. Like a good guidebook, the account sensitises the audience to what is likely to happen within a particular stage of a dimension. Not only may we understand the variety of processes within and between dimensions, we may construct policies and pedagogical models of ICT in education based on that understanding.

References

- Bereiter, C., & Scardamalia, M. (2006). Education for the Knowledge Age. In P. A. Alexander, and P. H. Winne (Eds.), *Handbook of Educational Psychology* (2nd ed.). (pp. 695-713). Mahwah, NJ: Lawrence Erlbaum.
- Fullan, M., Hill, P., & Crévola, C. (2006). *Breakthrough*. Thousand Oaks, CA: Corwin Press.
- Jonassen, D., Howland, J., Marra, R., & Crismond, D. (2008). *Meaningful learning with technology* (3rd ed.). Upper Saddle River, NJ: Pearson.
- Lim, C. P. (2007). Effective integration of ICT in Singapore schools: Pedagogical and policy implications. *Educational Technology Research and Development*, 55(1), 83-116.
- SEAMEO (2010). *Report: Status of ICT Integration in Education in Southeast Asian Countries*. Bangkok: SEAMEO Secretariat.
- Trilling, B. & Fadel, C. (2010). *21st Century Skills, Learning for Life in Our Times*. San Francisco, CA: Jossey-Bass.
- UNESCO (2005). *Regional Guidelines on Teacher Development for Pedagogy-Technology Integration*. Thailand, Bangkok: UNESCO Asia and Pacific Regional Bureau for Education.