

# The 1<sup>st</sup> APEC Future Education Forum 2005



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## *Directions of APEC Future Policy for ICT in Education*

**Submitted by:**

*Malaysia, Thailand & People's Republic of China*



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## Introduction

Many educational systems worldwide are putting much effort into the assimilation of information and communications technology (ICT) in schools. In the “Organisation for Economic Co-operation and Development” (OECD) area, for example, virtually every school system has introduced a basic level of ICT in the year 2000 compared to 1990 (Schleicher, 2003). A substantial number of countries have already applied ICT into their academic, curricular and pedagogical functions (e.g. Western and East Asian nations). These transformations and the processes, by which they occur, have become important research themes with obvious theoretical as well as practical implications. This paper discusses findings from a content analysis study of the ICT policies in education of the “Asia-Pacific Economic Co-operation” (APEC) countries, particularly the East and South-East Asian nations.

The aim of this study is to identify the trends of these policies and provide suggestions for the direction of future policies concerned. Starting with a discussion on the concept of policy and the policymaking process, this paper goes on to review literatures related to the formulation and development of global ICT policies in education to put the study into context. This will be followed by discussions on the method of data collection and findings from the analysis of data, concluding with some recommendations on future educational ICT policies for APEC economies.

## 1. Background

### 1.1. Policy and Policymaking

In general, the term ‘policy’ is being used to describe very different things (Ball, 1994). Among the many definitions, Caldwell and Spinks (1988) propose policy to mean “a set of guidelines which provide a framework for action in achieving some purpose on a substantive issue” (p. 90). They contend that conceptually, there is still a lack of agreement on the meaning of the term ‘policy’, which is often defined either

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too broadly, in terms of a set of goals or aims or in a statement of belief, or too narrowly, in terms of a detailed specification of a course of action to be followed or a set of rules and procedures. Policy has also been defined simply as “whatever the government choose to do, or not to do” (Taylor *et al*, 2004; p. 35). However, Ball’s (1998) definition befits this paper since he asserts that “policies are both systems of values and symbolic systems; ways of representing, accounting for and legitimising political decisions – policies are articulated both to achieve material effects and to manufacture support for those effects” (p. 124).

The study of policymaking was traced back to Harold D. Lasswell who claimed to be the first to articulate the concept of ‘policy sciences’ (Lasswell and Kaplan, 1950). Laswell suggests seven stages of ‘the decision process’ which comprise *intelligence, promotion, prescription, invocation, application, termination and appraisal* (deLeon, 1999; p. 20). Laswell’s policy process model engaged an entire generation of researchers (Jones, 1970; Anderson, 1975; Brewer and de Leon, 1983) who developed the most influential framework known as the ‘*stages heuristic*’ or the ‘*textbook approach*.’ This framework divides the policy process into four stages; agenda setting, policy formulation and legitimisation, implementation and evaluation.

The *stages heuristic*, however, was heavily criticised (Sabatier and Jenkins-Smith, 1993) with the notion that it has outlived its usefulness and needs to be replaced with better theoretical frameworks” (Sabatier and Jenkins-Smith, 1999; p. 7). However, this paper argues that in education, the policy process normally parallels the stages framed by the *stages heuristic*. Educational policymaking, particularly in Asia, is usually a top-down affair pursuing narrowly utilitarian goals and serving managerialist purposes of monitoring and accountability (Choi, 2003; Lam, 2003). Choi and Lam both referred to Hong Kong as an example where invited overseas experts designed its ‘target-oriented curriculum’ policy with limited input from local experts and with virtually no consultation with local, front-line teachers (Choi, 2003; Lam, 2003).

Policymaking can be seen as a combination of conflicts, ideological exchanges and economic concerns. A diversity of differences and preferences may result in vague

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and conflicting objectives among those who are directly and indirectly involved. If one accepts that political behaviour arises from disagreement, then evidently the policy process can be said to be highly political (Caldwell and Spinks, 1988; p. 94). Economic concerns are also addressed in most policymaking process to ensure control and power domination on the policy makers' part. At the international level, these influences are disseminated as flows of ideas through social and political networks and through the activities of various 'policy entrepreneurs' and multilateral agencies, groups and individuals who 'sell' their solutions in the academic and political market-place (Ball, 1998; pp. 123-124).

*The scenario appears to be the same in educational policymaking where 'conflicts, pressures and influences attend the translation of a specific set of educational issues into policy' (Ashford, 1981; p. 8). This argument is supported by Ball (1990) when he contends that 'education policy is infused with economic, political and ideological contradiction (p. 211). Where economy is concerned, Ball (1998; p. 122) argues that 'concepts such as 'learning society' and the 'knowledge-based economy' serve and symbolise the increasing colonisation of education policy by economic policy imperatives.'*

### 1.2. The Formulation of ICT Policy in Education

Political scientists have shown how the policy process everywhere is multidimensional, with policy outcomes that are hard to predict, regardless of the methodological or other qualities of the inputs (Temple, 2003).

#### **1.2.1. The Role of Politics**

Towards the end of the last century, many governments were concerned about education as a political priority and, in particular, educating for a technological future (Brown, 1999b). They were particularly interested in the state of affairs concerning the implementation of ICT in schools. With their national monitoring systems, governments were provided with the relevant information regarding

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their ICT implementation and the emergent obstacles in the process. Subsequently, their ministers of education could use this information to account to the public (Doornekamp, 2002) as well as motivating the public to participate actively in the use of ICT. Political acts have always been seen to exert autonomy and encourage people to think and act independently, i.e. to become users of information, rather than just passive consumers of ICT (Whitworth, 2003).

Many countries, through their government, have now established new ICT-based education policies. Internationally, the role of politics seems to be vital in the re-conceptualisation of “public interest”, as highlighted by Selwyn and Brown (2000) in an analysis of policy-making across Europe, East Asia and the USA. Many governments have carried out policies involving investment in education, investment in infrastructure, creation of favourable institutions and fostering new institutional innovations to promote ICT in education (Quibria *et al*, 2003). Policy makers are also interested in their positions compared to other surrounding countries. They want to know whether they are at the same level of implementation or not. A lower level of implementation might have consequences for the economy. When there are less trained workers in the field of ICT, “high-tech” companies are not eager to invest money (Doornekamp, 2002).

Sometimes a comparison with countries associated with ICT development success is made, to accommodate and seek advantages of the increasing interconnectedness in the contemporary world as well as attempting to develop a strong ICT sector and use it as a basis for development. An example of such a country is Jordan, having compared its ICT sector with Singapore and Ireland, two countries associated with success in attracting and developing ICT (Al-Jaghoub and Westrup, 2003). Jordan was found to have some similarities with Singapore and Ireland in terms of the size of the country, small population and few natural resources. Significant differences included the other two countries being early movers in ICT and Jordan having an edge over Singapore and Ireland in the Arabic speaking world when it relates to international markets. The discussion so far confirms that the formulation of educational ICT policies throughout the world

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depends on each government's political stance in education, which is highly influenced by globalisation.

### **1.2.2. The Role of the Private Sector**

*The role of politics was highlighted in the last section as being very significant for ICT-based education policies to get airborne. To sustain the implementation process of these policies, governments need more than just support from the private sector, in particular the ICT industry. There is a need for the private sector to be more involved, motivated and interested in educational ICT, as Selwyn (2002) argues:*

*'... business and educational technology are now inexorably linked, via the role of the IT industry in providing the technological artefacts that physically constitute 'educational technology' as well as the perceived needs of business and industry to employ future workforces educated with IT skills and 'computer literacy' (p. 52)*

In this context, governments are drawn to engage in partnerships with the private sector from the initial stage of policymaking. Jones and Bird (2002, p. 505) define this 'partnership' as 'a political design for the inclusion of some interests at the same time as it accomplishes or confirms the exclusions or sidelines of others'. Therefore, establishing public-private partnerships would project firms and big businesses as principal players in educational policymaking. Apart from 'kick starting' the policy process, the private sector's role will be very influential in shaping education policy, thus elevating business to be the second set of major leaders in government and politics.

Getting the private sector to act in league with government is central to developing countries like Jordan, which perceives the success of their ICT initiative to be due to the leadership of the private sector, with high-level support and positive action of governments (JRI, 2004). In this context, it would seem that this public-private partnership is the keystone of many ICT initiatives. In a

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broader perspective, the United Nation's ICT Task Force reports that identifying or engineering win-win situations is critical to securing lasting commitment from all the necessary parties, including private enterprises. It contends that the private sector is the engine for change and, as such, public-private partnership is the best way to ensure successful initiatives through the advance of ICT development strategies (Khan, 2002; p. 14).

The education community does not seem to accept the involvement of the private sector in education policymaking enthusiastically, which is not surprising, due to the generally 'profit-making' nature of businesses. As Selwyn (2002) puts it:

*'The increased role of business in education may well have been treated with suspicion by the educational community but much remains to be done to tease out that relationship, especially with regard to policy formation and implementation'*  
(p. 55)

The fact that business/industry is replacing traditional educational stakeholders, such as the teachers unions adds to the suspicion of the education community that governments are trying to restrict and gain total control of the education sector. For example, the early involvement of the ICT industry in the National Grid for Learning initiative can be seen as 'an attempt by the UK government to gain an initial hold over a potentially integral yet chaotic element of education they would otherwise have little control over' (Selwyn, 2002; p. 67). With such predicaments within the role of the private sector in educational ICT policymaking, Selwyn (2002, p. 69) proposes 'how these initial public/private foundations go on to affect longer term effectiveness of the ICT policies in education should form the focus of ongoing scrutiny'.

### **1.2.3. The Role of the State**

Education policies in Asia are highly centralised by strong leadership and drive. Their governments play proactive roles in gearing people towards nation, culture and identity building, areas of economic competitiveness and socio-economic improvement. The Asian region, thus, accepts education as an integral part of a broader "national information infrastructure" (NII) initiative. Blanning *et al* (1997)

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argue that the Asian NII differ from their Western counterparts in two counts. Firstly, they seem to rely more on ICT as an opportunity for them to “leapfrog” to the information age, and secondly, there is an apparent goodwill to use ICT as a conscious national policy to reduce the economic and social gaps. Most of these nations view their NIIs as part of an overall economic modernisation effort, not merely a technological infrastructure requiring financial resources but also a human resource development effort. They recognise the need for education and training to produce the educated manpower necessary to implement an NII. Thus its three cornerstones are technology, financial resources and human resources in a government-guided but market-led framework.

Emphasis on political economy was intended to focus attention on the role of the state in understanding the relationship between education, economy and society in different national contexts. Ashton and Green (1996) and Castells (1996) identified two distinct models, *neo-liberal* and *developmental*. *Neo-liberal* countries (Western countries like Europe and USA) treat education as a step-up to establishing the NII. Private sectors have a certain degree of influence over their NII and education policies. Governments generally implement their information and education policies through some sort of “remote control” while Asian countries mostly adopt the *developmental* model which depicts an educational ICT policy being an integral part of a broader national initiative (Selwyn and Brown, 2000). Being divided as such, the argument has shown that the difference in policy formulation between these two models do not rely solely on the economic status of the nations but tends to be inclined towards the political, social and cultural aspects of each country.

In an economy, the status of ICT adoption and usage of televisions, mainline telephones, mobile phones, fax machines and Internet (termed “new ICT”) are all indicators of ICT diffusion. New ICT is roughly divided into three broad categories, namely ICT for computing, ICT for communication, and ICT for Internet-enabled communication and computing (Quibria *et al*, 2003). The OECD (2003c) maintains that government should reduce unnecessary costs and regulatory burdens on firms to create a business environment that promotes

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productive investment. This involves policies that enable organisational change, encouraging good management practices, fostering innovation and strengthening education and training systems. In economic terms, policy should foster market conditions and competitive environments for the successful adoption of ICT. The network effects of Internet diffusion are also related to the possibility of “leapfrogging” by latecomers. They can be seen as a ‘digital opportunity’ presented to developing countries by the ‘new economy’. Sidorenko and Findlay (2001) conclude that the Asian region has much to gain from the complementarities of its economies, their openness to trade in ICT products and policy cooperation. This kind of argument is what sets off nations around the globe creating their own NII policies.

Governments will need to work with business and consumers to shape a regulatory framework that strengthens confidence and trust in the use of ICT, notably electronic commerce (e- commerce). Policies to foster growth in services are important too, as ICT offers a new potential for growth in the service sector, provided that regulations that stifle changes are adjusted or removed (OECD, 2003c). Unfortunately, most Asian governments are not able to simply support large investments of no immediate economic value in areas such as education. Information access depends on social and financial needs, which is controlled by industrialists (Birch, 1998). Birch and Langdale (1997) found social goals placed second to economic goals in the East Asian context. Since education can be considered as a social endeavour, ICT penetration in these least affluent countries is very slow indeed. Governments have to take into account economic and social fundamentals to formulate their ICT policies in education. The dawn of the information age seems to be travelling at such a pace that not all of society, as Touraine (1971) argues, will be able to realise its advantages.

### 1.3.Conclusion

There seem to be a certain expectation from policymakers that research should provide prescriptions rather than descriptions. The development of educational ICT

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policies involves various approaches in different countries. Many governments see centralised initiative to be the best means of benefiting all schools (Selwyn, 2000b). These countries are advanced and have national ICT policies in education formulated by their ministry of education as well as master plans for policy implementation (Villanueva, 2003a). Yet there are still countries lagging far behind in the ICT policy and ICT implementation race (Adam and Wood, 1999).

Policies to promote ICT into education vary in different countries and regions. ICT investments in education need appropriate policies based on strong political backing and economic provisions, as well as social balance and cultural suitability. Differences in diverse regions of the world entail different implications for policymaking, in particular the nation's ICT-based educational policy. The review of literature shows that the ICT environment in many Asian countries, in particular APEC economies, appears to be heavily influenced by their economic contexts and that there is a wide gap between *advanced* and *newcomer* nations.

## 2. Research Objectives

There are two main **objectives** of this research:

1. To trace out the trends of educational policy for ICT in all participating APEC economies, and
2. To make recommendations for future educational ICT policies in APEC economies.

Following these objectives and the arguments in the review of literature in the last section, three **research questions** are formed:

1. What are the trends of ICT policies for education in APEC economies?
2. What are the emergent issues due to the introduction of these policies?
3. What will the future trends of ICT policies in education for APEC economies be?

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## 3. Research Methodology

### 3.1. The Sample and Method of Data Collection

It was originally proposed (in the 1<sup>st</sup> APEC Workshop for Future Education Forum, Beijing, 19-22 April 2005) that all ten participating member economies; Chinese Taipei, Indonesia, Japan, Korea, Malaysia, Mexico, P.R. China, Philippines, Thailand and Viet Nam be the sample for this case study. Case study research has no specific methods of data collection (Bassegy, 1999). Hence, researchers may use methods that seem appropriate and practical to them. Therefore, representatives of each economy were expected to provide data in the form of online documents vis-à-vis the past, present and future ICT policies in education of their respective economies. They will also be furnishing information on the emergent issues due to the implementation of ICT policies in their respective economies. All documents will be submitted to the project leader from Malaysia, who will then organise and distribute the collected data online to other members of the project (i.e. P.R. China and Thailand) for analysis.

However, due to complications in communication via e-mail, official policy documents and research reports were obtained from the Internet and distributed among the other members of the project (P.R. China and Thailand). Among documents used were Farrel and Wachholz's (2003) meta-survey report and online documents "ICT in Education - Country Information" ([www.unescobkk.org/index.php?id=2070](http://www.unescobkk.org/index.php?id=2070)) and "ICT at a Glance" ([www.worldbank.org/data/countrydata/countrydata.html](http://www.worldbank.org/data/countrydata/countrydata.html)) No online documents were found on Chinese Taipei and information about Mexico was quite fragmented. Hence, members of the project decided to dismiss these two economies from their research.

### 3.2. Content Analysis

Analysis of the online documents was done using the technique of content analysis. Two of the definitions from the literature state that firstly, content analysis is a systematic, replicable technique for compressing many words of text into fewer

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content categories based on explicit rules of coding (Berelson, 1971; Krippendorff, 1980; Weber, 1990) and secondly, content analysis is “any technique for making inferences by systematically and objectively identifying specified characteristics of messages” (Frankfort-Nachmias and Nachmias, 1996; p. 324). This technique emphasises categorising according to certain coding exercises, hence, extending beyond simple word counts. This argument is supported by Stemler (2001) who contends that what makes the content analysis technique particularly rich and meaningful is its reliance on coding and categorising of the data. Additionally, Stemler argues that this technique also examines trends and patterns in documents.

*Texts can be defined broadly as books, book chapters, essays, interviews, discussions, newspaper headlines and articles, historical documents, speeches, conversations, advertising, theatre, informal conversation, or really any occurrence of communicative language (Busch et al, 2005). A category is a group of words with similar meaning or connotations (Weber, 1990; p. 37). With the texts extracted online, as discussed in sub-section 3.1, content analysis was performed on texts concerning policies, issues and recommendations from each participating APEC economy. Results of the analysis is presented and discussed in the Section 4 below.*

### 4. Detailed Findings

This section starts off by discussing the ranking of participating economies by order of their Gross National Income (GNI) per capita in the year 2003 followed by the trends of their ICT policies in education and their emergent issues.

#### 4.1. Economic Ranking

The rank of each participating economy was made by comparing their GNI per capita. GNI per capita is the GNI in current U.S. dollars as divided by the mid-year population. GNI measures the total domestic and foreign income claimed by the residents of the economy. It comprises GDP plus net factor income from abroad, which is the income residents receive from abroad for factor services (labor and capital) less similar payments made to non-residents who contributed to the domestic

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production. GNI in U.S. dollars is calculated according to the World Bank Atlas method of conversion from national currency to U.S. dollar terms.

**Table 1:** GNI Per Capita of APEC Economies in 2003

| <b>Economy</b>  | <b>Population (Millions)</b> | <b>GNI (US\$ billions)</b> | <b>GNI/capita (US\$)</b> | <b>Rank</b> |
|-----------------|------------------------------|----------------------------|--------------------------|-------------|
| Japan           | 127.2                        | 4,390.0                    | 34,510                   | 1           |
| Korea           | 47.9                         | 576.4                      | 12,030                   | 2           |
| Malaysia        | 24.8                         | 96.1                       | 3,880                    | 3           |
| Thailand (2004) | 62.4                         | 152.3                      | 2,440                    | 4           |
| P.R.China       | 1,288.4                      | 1,411.6                    | 1,100                    | 5           |
| Philippines     | 81.5                         | 88.0                       | 1,080                    | 6           |
| Indonesia       | 214.5                        | 173.5                      | 810                      | 7           |
| Viet Nam        | 81.3                         | 38.8                       | 480                      | 8           |

Source: The World Bank Group (2004)

Based on GNI/capita column of Table 1, Japan appears to be the wealthiest (US\$34,510) participating APEC economy, with its wealth about three times that of Korea (US\$12,030) and ten times that of Malaysia (US\$3,880). In contrast, Viet Nam seems the least wealthy (US\$480) followed by Indonesia (US\$810). Obviously there is a huge economic gap between participating APEC economies, with Japan's GNI per capita being nearly 70 times that of Viet Nam and 40 times that of Indonesia. This enormous economic divide sets some sort of basis for the trend of educational ICT policy to be discussed next.

## 4.2. ICT Policy and Related Issues in Education

The result of the content analysis performed on the policy documents and texts of the eight participating APEC economies is presented in Table 2. Overall, there are eight policy themes identified. They include (a) ICT in school curriculum, (b) ICT in education management, (c) ICT-based HRD and training, (d) ICT infrastructure, technical & security, (e) Digital divides, (f) ICT in distance education, (g) Government-Private partnerships in ICT, and (h) ICT in support of R&D. Each policy themes is detailedd henceforth.

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Table 2. Distribution of ICT Policies and Issues in APEC Economies

|   | Policy Area/APEC Economies               | Indonesia           | Japan               | Korea               | Malaysia            | P.R.China           | Philippines         | Thailand            | Viet Nam |
|---|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------|
| 1 | ICT in School Curricula                  | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ | $\alpha$            | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ | $\alpha$ |
| 2 | ICT in Education Management              |                     |                     | $\alpha$            | $\alpha$            |                     |                     |                     | $\alpha$ |
| 3 | ICT-based HRD and Training               |                     | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ |                     |                     | $\beta$             | $\beta$             | $\alpha$ |
| 4 | ICT Infrastructure, Technical & Security |                     | $\alpha$            | $\beta$             |                     | $\beta$             | $\alpha$<br>$\beta$ | $\beta$             | $\beta$  |
| 5 | Digital Divides                          | $\beta$             |                     | $\alpha$<br>$\beta$ | $\alpha$<br>$\beta$ |                     |                     | $\beta$             |          |
| 6 | ICT in Distance Education                | $\alpha$            |                     |                     |                     |                     |                     | $\alpha$            |          |
| 7 | Government-Private Partnerships in ICT   | $\alpha$            |                     |                     |                     | $\alpha$<br>$\beta$ |                     | $\beta$             |          |
| 8 | ICT in Support of R&D                    |                     |                     |                     |                     |                     | $\alpha$            |                     |          |

$\alpha$  → APEC ICT **Policy** in Education

$\beta$  → **Issues** of APEC ICT Policy in Education

All participating economies have policies pertaining to ICT in school curricula (see Appendix A for detailed table of national ICT policy in education). They include statements like the development and implementation of ICT curricula, using ICT as a tool for teaching and learning, as part of a subject and as a subject by itself, and

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developing competence in using technology, in designing, producing, and using ICT-based instructional materials.

Apart from Korea and Viet Nam, the other economies face policy issues related to ICT in school curriculum such as the difficulty in integrating and incorporating ICT successfully into the teaching and learning process at all levels of education, the need for appropriate content and courseware for ICT use in classrooms and the lack of software in local languages. For Indonesia, the use of ICT to facilitate learning and e-learning at basic education levels is carried out by some schools based on their own initiative rather than by national policy while Thailand has to resolve the issue of its education focussing only on basic computer skills and English. The case of Korea and Viet Nam is quite unique. The GNI per capita for Korea is about 24 times that of Viet Nam. Yet both do not portray incorporating ICT in their school curriculum as being an issue.

Korea, Malaysia and Viet Nam embraced ICT in education management as their related policy statements. Their guiding principles included the Korean's (a) monitoring progress and usage, and (b) operating e-governance in education, as well as the Malaysian's (c) ICT used to increase productivity, efficiency and effectiveness of the management system, and the Vietnamese's (a) meeting the demand for educational management. Surprisingly, none of the participating economies have issues on ICT in education management.

Another three economies resorted to the theme "ICT-based HRD and Training". They are Japan, Korea and Viet Nam. While Japan and Korea have issues related to the theme, Viet Nam does not. However, there were two economies, Phillipines and Indonesia which have issues related to the theme but do not have the appropriate policy concerning it. Japan, with its policy on human resources development and education and promotion of training, is faced with the issue of re-training teachers currently in the classrooms, providing training opportunities and building environments that facilitate such trainings. Standardizing ICT skills and revising curricula is a policy in Korea, still addressing the issue that training programmes for

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educators and students are only focused on computer literacy and ICT utilization whereas none cover critical thinking, problem-solving, communication and interpersonal skills.

Viet Nam's related policy for this theme is meeting the demand for ICT human resources. The case of the Philippines disclose the issue of no comprehensive and sustained in-service training for teachers and education managers while Thailand reveals issues of the need for ICT literate teachers effective peer-training, lack of sustainable and systematic professional development and the Need for realistic objectives in training programmes.

The next policy is themed 'ICT infrastructure, technical and security', outlined by Japan the creation of basic ICT infrastructure. The Philippines have two related policies; providing physical infrastructure and technical support, and developing competence in using technology, in designing, producing, and using ICT-based instructional materials. Equipping schools with ICT facilities is still a problem in the Philippines though.

Only Korea and Malaysia addressed the 'digital divide' with 'narrowing digitally divided nations and people' and 'ICT used as an enabler to reduce the digital gap between schools' respectively. Digitally divided in view of income, location and gender is a big issue in Korea whereas Malaysia's digital divide encompass not only socio-economic factor but also geographical locations. Internet connectivity in Malaysia, for example, is concentrated in the capital city, Kuala Lumpur, whereas outside this area many schools still do not have telephone lines.

In the area of ICT in distance education, Indonesia and Thailand have 'establishment of distance education programmes and facilitating the use of Internet for more efficient teaching and learning' and 'making full use of ICT and distance education to meet the needs and aspirations of all citizens for continuing education and skills upgrading regardless of age, profession, distance or geography with special attention being given to people with disabilities' respectively. However, none of the participating economies feel that distance education is a policy issue.

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Indonesia upholds ‘collaboration between the ICT industry and ICT educational institutions’ to fit the theme ‘Government-Private partnerships in ICT’, even though this partnership is not an issue in the economy. The other economy, People’s Republic of China, maintains ‘developing policies regarding education enterprises that will encourage more financial investment and support development of ICT corporations’ as its policy in this area with ‘immaturity of the educational ICT industry’ being its issue. Thailand, although without a policy statement on this public-private partnership, addresses the issue of ‘the lack of input from private sector.’

Lastly, only the Philippines tried to deal with ‘ICT in support of research and development (R & D)’ with its ‘ensuring access to the latest developments in ICT and to support research and development’

### 5. Discussions and Conclusions

This section attempts to address all research questions in this study as well as providing an overall conclusion.

#### 5.1. Research Question 1: What are the trends of ICT policies for education in APEC economies?

Based on the findings earlier, the trend so far is to integrate ICT into the classroom and curriculum. All the participating economies support this policy. Obviously, every government has to take educational implications into account when formulating their ICT policies. The race to impose ICT-based educational policies shows each government’s concern and determination to see ICT integrated fully into their education systems (Selwyn and Brown, 2000). These policies were formulated with the highest regard for teachers as change agents, with a view to enable them to feel confident as well as be competent in teaching with the use of ICT within the curriculum (Selwyn et al, 2001).

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The next trend is assimilating ICT into education management. The implementation of ICT policies in schools affects not only teaching and learning activities but the management of the schools. Management takes up a huge proportion of an educator's teaching and non-teaching time (Torrington *et al.*, 1989; Ashaari, 1996; Easthope and Easthope, 2000). In Asia, school management is practised rather differently compared to the West (Chapman, 2000). In general, Asian school managers face four areas of responsibility, namely school management, school-ministry communications, school-community relations and instructional supervision, which their governments view as their principal set of responsibilities. Thus, support in realising innovations in schools depends considerably on management.

The importance of management in the course of improving education quality in schools has been discussed extensively (e.g. Chapman, 2000; Easthope and Easthope, 2000; Wagner, 2000) with specific debates on the improvement of education quality (e.g. Levacic, 1995; Glennan, 1998). Academics have also argued on the need to address the fundamental requirements of change management (e.g. Miles, 1993; Marsh, 1994; Horsley and Kaser, 1999; Senge *et al.*, 1999; Harris, 2000). Yet, relatively little is known about the issues involved in effective uses of ICT for enhancing school management, although frequently asserted to be a vital constraint on the successful implementation of ICT in schooling (Bird, 1986; Bluhm, 1987; Pelgrum and Plomp, 1991; Visscher, 1993).

Finally, incorporating ICT into teacher training is also a policy trend. It can also be stated as applying ICT-based human resource development (HRD). Education quality in Asia tends to be based on a systems model (Chapman and Adams, 1998). In the Netherlands, for example, Doornekamp (2002) even recommends that the government create an appropriate environment for teacher training by integrating professional development in teachers' daily activities.

### **5.2. Research Question 2: What are the emergent issues due to the introduction of these policies?**

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Emergent issues appear most in the area of ICT integration in the curricular followed by issues of ICT infrastructure, technical and security support. Support from other bodies and in all forms is also mentioned in the literature concerning the success of ICT implementation in schools. It is quite easy to relate failure in education with absence of support of any kind but the fact remains that substantial positive educational outcomes will not occur without very large expenditures on support (Schofield, 2003). Otherwise, where ICT is concerned, lack of support such as more technical difficulties in using the Internet (Olsson *et al*, 2003) or lack of support in internal and external software (Tearle, 2003) can always be used as excuses. It should be realised that introducing ICT into the multi-goal learning environment of schools are processes of socio-technical alignment. These processes are informed by particular knowledge domains and flows of knowledge. They use particular instructional techniques embedded in software and curricula design. Hence, in attempting to assimilate ICT into schools, the support needed is provided by specific mixes of technology, ICT in particular (Kinder, 2002).

Training and digital divide are another two issues faced by participating economies.

Lack of training appears to be one of the major issues expressed by teachers when implementing new technological innovation. Although their ICT ability had moved beyond the ‘beginner’ stage, many teachers are expressing difficulty in gaining skills with more sophisticated tools, such as presentation graphics, desktop publishing and web publishing (O’Mahony, 2003). O’Mahony argues that a well-defined professional development programme is crucial for teachers to succeed with ICT in the classroom. Teachers usually acknowledge any possible learning benefits offered by ICT within the context of their school culture. Hence, the willingness of teachers to be trained outside the context of their school ethos seems to be an ongoing issue in assimilating innovation in their “small” world. Since school managers and teachers are the recipients of any new educational policies to be implemented in schools, they are more than aware of whether the training provided has prepared them to improve education in schools and their opinion and views should always be taken into account when designing such

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programs.

Hacker and Mason (2003) argue that a major problem with much of the digital divide research is a failure to include ethical concerns as an explicit part of analysing and interpreting digital divide gaps. Issues which relate to society and culture need further investigation, especially on the wider role of media and cultural constructions of what is 'educational' and what is not, as well as the mediating influence of parents, local authorities and the societal "culture of ICT" (Selwyn, 2003). Dill and Anderson (2003) focused more on the schools by arguing about whether the issues faced by educators using ICT are ethical and legal, especially when assigning digital content to their students. They proposed that institutional policies regarding the boundaries of acceptable ICT use can help educators deal with ethical and legal issues.

No issues, however, were mentioned in the areas of ICT in education management, ICT in distance education and ICT in support of R&D.

### **5.3. Research Question 3: What will be the future trends of ICT policies in education for APEC economies be?**

The present trends, as discussed in research question 1 earlier, should be in gear now in most APEC economies. Incorporating ICT into the school curricular, education management and training should be fulfilled within this few years if the present trend progressed successfully. Referring to Table 3, none of the participating economies recommended integrating ICT into education management and distance education. However, the suggestion by Japan to integrate ICT in supporting R&D looks to be a coming trend. The recommendation by the Philippines to advance government-private partnership in ICT is the other potential policy educational trend in the future.

### **Table 3 Recommendations for Future APEC ICT Policy in Education**

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| Policy Statements |  | Indonesia | Japan | Korea | P.R.China | Philippines | Thailand | Viet Nam |
|-------------------|--|-----------|-------|-------|-----------|-------------|----------|----------|
| 1                 | ICT in School Curricula                  | γ         | γ     | γ     | γ         |             |          | γ        |
| 2                 | ICT Infrastructure and Technical Support | γ         |       |       | γ         | γ           |          |          |
| 3                 | ICT-based HRD and Training               |           |       |       |           | γ           |          | γ        |
| 4                 | Digital Divides                          |           |       |       |           |             | γ        | γ        |
| 5                 | ICT in Support of R&D                    |           | γ     |       |           |             |          |          |
| 6                 | Government-Private Partnerships in ICT   |           |       |       |           | γ           |          |          |

As present policies take course, most of the economies will be fundamentally equipped and incorporating ICT in most of their education systems. Japan, as the wealthiest economy in East Asia, takes the lead by suggesting ICT in R&D which should jumpstart this policy area to be adopted by the rest, when basic ICT foundation has been fulfilled. The move towards public-private partnership should be the course of APEC educational policy trends since ICT is always advancing and government funding cannot be expected to last forever. The policy to incorporate this kind of partnership is expected to cultivate the culture of research-based decision-making and an ongoing financial support for ICT-based R&D in APEC economies.

### 5.4. Conclusion

This paper concludes that the trend of APEC educational ICT policy is moving from institutional-based (i.e. infrastructural, curricular, managerial and support) towards a more dynamic stance in the form of government-private partnership and more proactive towards supporting research and development.

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**APPENDIX 1**

**CURRENT POLICY FOR ICT IN EDUCATION IN APEC ECONOMIES**

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## Current Policy for ICT in Education in APEC Economies

| <i>Economy</i> |             | <i>Current Policy for ICT in Education</i>  |
|----------------|-------------|---|
| 1              | Indonesia   | <ul style="list-style-type: none"> <li>a. Collaboration between the ICT industry and ICT educational institutions</li> <li>b. Development and implementation of ICT curricula</li> <li>c. Use of ICT as an essential part of the curricula and learning tools in schools, universities and training centers</li> <li>d. Establishment of distance education programmes. Facilitation of the use of Internet for more efficient teaching and learning</li> </ul>   |
| 2              | Japan       | <ul style="list-style-type: none"> <li>a. Creation of basic ICT infrastructure</li> <li>b. Human resources development and education/promotion of training</li> <li>c. Promoting ICT classroom teachings</li> </ul>   |
| 3              | Korea       | <ul style="list-style-type: none"> <li>a. Standardizing ICT skills and revising curricula</li> <li>b. Maintaining financial subsidies</li> <li>c. Narrowing digitally divided nations and people</li> <li>d. Monitoring progress and usage</li> <li>e. Operating e-governance in education</li> </ul>   |
| 4              | Malaysia    | <ul style="list-style-type: none"> <li>a. ICT provided to all students so that it is used as an enabler to reduce the digital gap between schools</li> <li>b. ICT used in education as a teaching and learning tool, as part of a subject and as a subject by itself</li> <li>c. ICT used to increase productivity, efficiency and effectiveness of the management system</li> </ul>  |
| 5              | P.R.China   | <ul style="list-style-type: none"> <li>a. Modernization of education by applying ICT</li> <li>b. Develop policies regarding education enterprises that will encourage more financial investment and support development of ICT corporations</li> </ul>  |
| 6              | Philippines | <ul style="list-style-type: none"> <li>a. Providing physical infrastructure and technical support that makes ICT accessible and useful to students, teachers, administrators and support staff</li> <li>b. Developing competence in using technology, in designing, producing, and using ICT-based instructional materials</li> <li>c. Ensuring access to the latest developments in ICT and to support research and development</li> <li>d. Undertaking a curriculum improvement programme focused on the</li> </ul> |

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|   |          |  |
|---|----------|--|
|   |          | <p>integration of technology</p> <p>e. Promoting the use of appropriate and innovative technologies in education and training</p>  |
| 7 | Thailand | <p>a. Employing ICT as an enabling tool to access information and gain knowledge through self-paced learning, or through interactions with teachers and fellow students</p> <p>b. Providing an enriched environment in which distant resources can be made available remotely at one's fingertips</p> <p>c. Making full use of ICT and distance education to meet the needs and aspirations of all citizens for continuing education and skills upgrading regardless of age, profession, distance or geography ~ special attention must be given in particular to people with disabilities</p> |
| 8 | Viet Nam | <p>a. Meeting the demand for ICT human resources</p> <p>b. Meeting the demand for educational reform in content, teaching and learning methods</p> <p>c. Meeting the demand for study modes</p> <p>d. Meeting the demand for educational management</p>  |

**APPENDIX 2**

**ISSUES OF ICT POLICY IN EDUCATION IN APEC ECONOMIES**

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## ISSUES OF ICT POLICY IN EDUCATION IN APEC ECONOMIES

| <i>Economy</i> |             | <i>Issues of ICT Policy in Education</i>  |
|----------------|-------------|---|
| 1              | Indonesia   | <p>a. The use of ICT to facilitate learning and e-learning at basic education levels is carried out by some schools based on their own initiative rather than by national policy</p> <p>b. Unequal access to ICT between men and women</p>  |
| 2              | Japan       | <p>a. Incorporating ICT successfully into the teaching process</p> <p>b. Re-training those teachers currently in the classrooms, providing training opportunities and building environments that facilitate such trainings</p>  |
| 3              | Korea       | <p>a. Lack of standardization causes difficulty in developing and utilising educational information and materials ; students consuming too much time chatting, playing games and accessing pornographic sites</p> <p>b. Copyright, privacy and negative use of Internet remaining unresolved</p> <p>c. Digitally divided in view of income, location and gender</p> <p>d. Training programmes for educators and students only focused on computer literacy and ICT utilization, none cover critical thinking, problem-solving, communication and interpersonal skills</p> |
| 4              | Malaysia    | <p>d. Digital divide – internet connectivity concentrated in capital city whereas outside this area ~ 1,000 schools (12%) do not have telephone lines</p> <p>e. Integration of ICT into teaching and learning at all levels of education – training of teachers, administrators and other school staf</p>   |
| 5              | P.R.China   | <p>a. Lack of a clear and shared understanding of informationisation</p> <p>e. Deficiency of the investment in educational informationisation</p> <p>f. Difficulty of intergrating ICT into education</p> <p>g. Demand for ICT experts</p> <p>h. Constraints of education informationisation facilities in elementary schools</p> <p>i. Immaturity of the educational ICT industry</p>  |
| 6              | Philippines | <p>a. No comprehensive and sustained in-service training for teachers and education managers</p>  |

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|   |          |  |
|---|----------|--|
|   |          | <ul style="list-style-type: none"> <li>b. Equipping schools with ICT facilities is still a problem</li> <li>c. Availability of courseware for ICT use in classrooms</li> </ul>   |
| 7 | Thailand | <ul style="list-style-type: none"> <li>a. Accessibility and affordability</li> <li>b. Extensive telecommunications infrastructure</li> <li>c. Highly centralized access</li> <li>d. Long-distance call from remote areas</li> <li>e. Digital divide within the nation</li> <li>f. Need for appropriate content</li> <li>g. Present focus on basic computer skills and English</li> <li>h. Lack of software with Thai contents</li> <li>i. Lack of evaluation standards</li> <li>j. Lack of input from private sector</li> <li>k. Need for ICT literate teachers</li> <li>l. Effective peer -training</li> <li>m. Lack of sustainable and systematic professional development</li> <li>n. Need for realistic objectives in training programmes</li> </ul> |
| 8 | Viet Nam | <ul style="list-style-type: none"> <li>a. Lack of Vietnamese language software</li> <li>b. Limited ICT facilities</li> <li>c. Limited access to Internet</li> <li>d. Lack of qualified personnel</li> </ul>  |

**APPENDIX 3**

**RECOMMENDATIONS FOR FUTURE APEC ICT IN EDUCATION POLICY**

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## Recommendations for Future APEC ICT in Education Policy

| <i>Economy</i> |             | <i>Recommendations</i>  |
|----------------|-------------|---|
| 1              | Indonesia   | <ul style="list-style-type: none"> <li>a. Providing higher access through expansion of ICT infrastructure</li> <li>b. Providing incentives for content development</li> <li>c. Immediately develop a national policy and strategic plan for harnessing the use of ICT in education</li> </ul>   |
| 2              | Japan       | <ul style="list-style-type: none"> <li>a. More academic research, training and repeated practice are required to incorporate ICT into teaching process</li> </ul>   |
| 3              | Korea       | <ul style="list-style-type: none"> <li>a. In the future, policies and action plans should be designed to promote thinking skills, and ICT should be the useful and convenient tool to help students to think</li> <li>b. Developing better quality educational programs</li> <li>c. Applying e-learning contents standardization</li> <li>d. Integrating ICT in daily learning activities</li> </ul>  |
| 4              | P.R.China   | <ul style="list-style-type: none"> <li>a. Steps towards educational informationisation:               <ul style="list-style-type: none"> <li>i. Info infra construction</li> <li>ii. Applying ICT into all aspects of education</li> <li>iii. Change all aspects of the education system; edu environment, edu content, pedagogy &amp; admin methods</li> </ul> </li> </ul>   |
| 5              | Philippines | <ul style="list-style-type: none"> <li>a. Given the budgetary constraints, the participation of other stakeholders (e.g. local government units, PTAs, NGOs and the private sectors) needs to be encouraged to provide education technology packages</li> <li>b. Lease arrangements rather than procurement should be explored as an alternative due to lack of technical staff to maintain computers and networks</li> <li>c. Develop a system to produce ICT-based education, including the development of ICT-based materials in teacher training</li> </ul> |
| 6              | Thailand    | <ul style="list-style-type: none"> <li>a. Initiatives should touch more on the fundamental issues (e.g. more equal and affordable access to the Internet) rather than project-based</li> </ul>  |
| 7              | Viet Nam    | <ul style="list-style-type: none"> <li>a. A formal programme should be developed to extend the level of</li> </ul>  |

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|  |  | <p>access to computers and to improve computer skills in order to encourage Internet take-up among students in primary and secondary schools</p> <ul style="list-style-type: none"><li>b. Some programmes devoted to content development in the local language should be initiated</li><li>c. Any international assistance to enhance the use of ICT in Viet Nam's education should be focused on the elimination of the four types of digital divide: access, HRD, language and content</li></ul> |
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