ICT Skill Development in the Asia-Pacific Region
Part two: Bridging the gap between demand and supply

Summary

This APDIP e-Note is the second in the series on information and communications technology (ICT) skill development in the Asia-Pacific region. While the first part examined the gaps between demand and supply of ICT skills, this APDIP e-Note focuses on what could be done to bridge the identified gaps. Although there is widespread recognition of ICT skill shortages in the region, the nature and scale of the imbalance between demand and supply, the impact of ICT penetration on changing skill needs, and the quality of skills being imparted by academic and training institutions have not been adequately addressed through policies and strategies.

The nature of demand for ICT skills, the size of the ICT workforce, and its rate of growth vary from county to country. These parameters of demand would change as countries move from the initial stage of ICT introduction to maturity. The ICT training capacity in all the countries of the region is increasing. However, the extent of expansion is inadequate to meet the increasing demand.

A comprehensive and dynamic national planning and forecasting mechanism needs to be put in place at individual country level, and supported by a regional mechanism that can monitor regional trends in ICT skill demand and supply. Expansion of ICT training capacity through encouragement of private sector investment and use of innovative Internet-based training are strategic actions that should be seriously considered. To improve the quality of ICT skills imparted by existing training institutions, continuous monitoring of the quality of training by national authorities, and establishment of skill testing and certification centres at the national and regional levels are important. Development of regional standards for ICT skills and occupations, and harmonization of national standards with the developed regional standards are also urgent necessities.

What is being done to bridge the gap between demand and supply?

There is widespread recognition in the region of an expanding gap between demand and supply of ICT skills. What is however not fully appreciated is the nature and scale of the imbalance between demand and supply. A significant number of countries in the Asia-Pacific region have attempted to increase ICT training facilities, either through expansion of existing training institutions or by establishing new ones. The increasing demand for ICT skills has also attracted private sector training companies, from within and outside the region to set up ICT training institutions. In most cases, however, national efforts seem to have consistently underestimated the size of the market for ICT skills. In rare cases where the overall demand and supply balance was achieved, there were imbalances at the individual skill levels: surpluses in some skills and severe shortages in many others. The impact of the ICT penetration and diffusion within the region on the job market as a whole is yet to be fully appreciated at the policy level in most developing countries of the region.

What should be done at the national level to bridge the gap?

All the countries in the Asia-Pacific region experience ICT skill shortages both in the ICT supply industry and in the use of ICTs. Nations that are newcomers to ICT may not experience the effects of ICT skill shortages as much as nations that are passing through the phase of rapid growth. The rate of growth in the demand for ICT skills in a country would logically correspond to the rate of ICT diffusion in that country. ICT like other innovative technologies pass through different rates of penetration and growth from introduction to maturity (as shown in the Figure 1). The nature of ICT skills in demand and the rate of growth of demand for ICT skills would vary with the stage of diffusion at which a particular country is at a particular time.

Figure 1: ICT Skills at Various Stages of ICT Diffusion
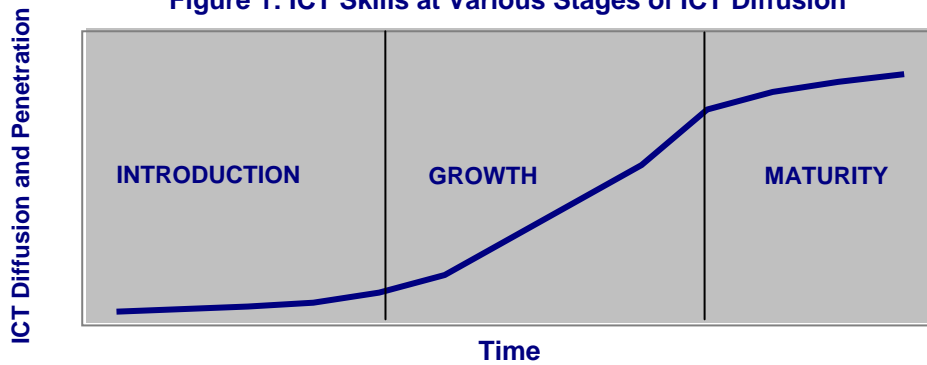
Source: Prepared by Author (based on Diffusion of Innovations Theories by Everett Rogers. http://en.wikipedia.org/wiki/Diffusion_of_innovations)

The policies and strategies for ICT skill development would therefore need to be dynamically monitored and adjusted as the country moves from one stage of ICT diffusion to another. In each country, a national ICT skill monitoring mechanism needs to be established that can comprehensively project demand and supply of ICT skills at the aggregate level, as well as at individual skill levels. Furthermore, the impact of ICT penetration on national human resources, including changing pattern of skills needed in the rest of the economy in the wake of ICT penetration, must be fully recognized. Given the dynamic nature of ICT, the proposed model should also be dynamic, and so should the policy and strategic response by the decision makers in government, private sector and training institutions. The traditional five- or ten-year human resources planning cycle to which most planners in the region is accustomed to would be inappropriate in the fast changing ICT environment. A shorter planning cycle and continuous monitoring mechanism would be essential.

In most countries of the region it would be necessary to expand the supply of ICT professionals and ICT skilled work force by increasing enrollment in ICT courses at universities and other technical institutes, and by encouraging private sector training institutions to expand their intake. As a long-term solution, it would be important to boost ICT education at primary and secondary schools and increase content on basic ICT in school curriculum. This would create an ICT literate population in the region and set the foundation for further ICT skill development throughout the individual's career. Many countries in the region including China, India, Indonesia and Malaysia already have policies and programmes in place aimed at expanding ICT education in schools.

To train and retrain a large workforce in ICT skills in the demand sectors of the region, estimated to be about 270 million in the next five years (Raina, 2007), would not be feasible if we have to rely solely on traditional classroom-style training. Innovative training methodologies would need to be employed. Remote training and self-learning based on web delivery of content, development of electronic Learning Management Systems (LMS), encouragement of learning and knowledge sharing communities, and creation of self-learning attitude are attractive strategic options to explore.

How can the gap in the quality of ICT skills be bridged?

ICT employers often report of the poor ICT skills imparted by existing training institutions in the region. This can have serious implications for the growth and development of the regional ICT industry. On one hand, there would be large number of unemployed graduates. On the other hand, there would be skill shortage and vacant jobs in the industry. In many ICT-advanced countries of the region, the industry and the government have joined forces to try and come to grips with this problem. Some of the actions that have been suggested are:

- Strict control on the quality of education given, by continuous monitoring of the ICT education curriculum as well as pedagogy, by a national authority;

- Establishment of national and regional skill certification centres patterned on the chartered accountant examinations (which must be passed in order to receive certification to practice); and

- Constant interaction between the ICT industry, government and the educational institutions in order to develop and design courses that impart appropriate ICT knowledge and skills, including cognitive skills.

What should be done at the regional level to bridge the demand and supply gap?

Development of regional standards for ICT occupations and corresponding skills is an urgent necessity. The national ICT skills and occupational classification standards are largely absent in the region; and wherever they exist, they are based on the skill needs of the telecommunication and electronics industry of yesteryears. The national standards for ICT skills are now being revised and developed in some

countries of the region, taking into consideration the present state and developments in the ICT field. There are limited moves however, to harmonize the national standards of the region (where they exist) or to develop regional standards for ICT skills and occupations based on the pattern of the European ICT skill and occupational standards. The adoption of regional standards and the harmonization of national standards would give considerable mobility to ICT professionals and could encourage development of regional ICT training institutions.

A regional ICT skill monitoring model should be developed that could help to regularly assess and project the demand for and supply of ICT skills in the region. Each country is following its own mechanism for human resources assessment and projections. In the ICT human resources area there appears to be considerable diversity among the nations in assessing and monitoring demand and supply of skills and in the models and methodologies they use in providing projections and forecasts. The proposed regional initiative would bring some degree of harmonization and provide vital guidance for national policy-making. This regional action could be taken by international bodies such as the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT) based in Incheon, Republic of Korea.

Establishment of a Regional ICT Skill Certification Centre should be given serious consideration by the governments, private ICT companies and the region's ICT education fraternity. Maintenance of a high standard in ICT skills and attainment of a certain standard in the quality of ICT education is an important challenge that each country in the region faces. Certifying skills of ICT professionals as they graduate from their universities and colleges and over their working life as new technologies appear is apparently an urgent need if the goal of quality ICT education and life-long learning is to be attained. The proposed Regional Centre for ICT skill certification could provide this service to the regional professionals. This would ensure that a certain level of skill be maintained irrespective of where and from which college or institution the professional obtain his or her basic degree or diploma.

Research and development, and capacity building in the ICT sector is critical if the region is to reduce its dependence on technologies from Europe and the United States. Although there is an increase in ICT product-related research and development in the region, there is limited fundamental, basic and innovative research done in the regional ICT centres of excellence. Increased funding by the governments and the private sector to ICT research and development and cooperation between the ICT research centres in the region would be effective strategic moves to achieve this goal.

Appropriate intellectual property laws and regulations that recognize and protect the rights of individual and institutional researchers and innovators are on one hand necessary to encourage innovation, research and development, and on the other hand, will encourage cooperative research, sharing of research results, and enhance the productivity and mobility of ICT researchers in the region.

Conclusion

The expanding gap between demand and supply of ICT skills in the region should be a matter of serious concern not only for the ICT industry but also for the economy of the region as a whole. Strategic and operational actions at national and regional levels are called for to bridge the expanding gap. Monitoring, planning for and forecasting of demand and supply of ICT workforce through systematic model building at national and regional levels is necessary.

Governments, private sector and training institutions must put in place systems for improving and monitoring the quality of ICT training through skill certification, and standardization of ICT skills and occupations. Increased investment in ICT research and development is also important for building capacities and skills in this area.

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References and Additional Reading

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