Technical and Vocational Education and Training:
Issues, Concerns and Prospects 19

Rupert Maclean
Shanti Jagannathan
Jouko Sarvi *Editors*

Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific

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Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific

Technical and Vocational Education and Training:
Issues, Concerns and Prospects

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Foreword

Appropriate policies and practices for skills development currently occupy a dominant place in development discourse. As countries in Asia and the Pacific recalibrate their growth models to consolidate their positions in the global economy, availability of a highly skilled and technically qualified human resource base will be a crucial determinant of success. In their quest to gain market shares in higher-order manufacturing and services, governments and other stakeholders are paying close attention to developing the requisite technical and scientific capabilities. If emerging economies in Asia and the Pacific are to maintain their robust economic growth rates, they need to respond to the challenges posed by the ascent of knowledge economies. The labor cost advantages in manufacturing of the past are giving way to innovation-intensive competitiveness based on the ability to generate new ideas, products, and processes. Mere cost advantages are no longer sufficient, and companies should have a holistic approach considering economic, social, environmental, and financial aspects. Advancement of societies is predicated on putting knowledge and innovation to work and developing new products and new services. This requires governments to have appropriate policies and incentives to deepen talent pools and to expand access to market-relevant skills development to the disadvantaged sections of the population.

ADB has long collaborated with its developing member countries as a financial and knowledge partner on pressing development challenges. In the area of skills and training, ADB is working with governments to help them simultaneously achieve several interrelated objectives: inclusive economic growth, human capital development, innovation and technology absorption, and social cohesion. ADB attaches great importance to education and skills training, not just for their own merit, but also as enablers to fully realize gains from other key developmental areas, including infrastructure, environment, and finance sector.

ADB convened an international skills forum at its Manila headquarters in December 2011. This was the first in an annual series of annual knowledge sharing events that ADB intends to organize. The forum brought together a diverse group of international experts, CEOs of companies and institutions engaged in skills and workforce development, and representatives of multilateral agencies, government,

and the private sector. This volume compiles their valuable contributions to advance thinking and practice related to skills development. We are deeply grateful to the participating individuals and institutions for sharing their insights and perspectives. This volume reflects our common desire to build a shared understanding of key priorities in the skills sector and more importantly a shared commitment, pooling our knowledge and resources. It is my hope that this volume advances dialogue on effective policies and practices for creating a highly skilled and creative workforce and talent pool that is essential to achieving inclusive economic growth in Asia and the Pacific.

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Mandaluyong, Metro Manila, Philippines

Bindu Lohani
Vice-President
(Knowledge Management
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Preface

This volume brings together views, perspectives, and insights from policy makers, practitioners, and leading experts on skills development for inclusive and sustainable growth. ADB is privileged to have collaborated with such an eminent group of professionals in this endeavor to put together the combined wisdom and experiences for wider knowledge sharing.

The volume is organized in four parts: the first part provides an introduction to major trends and concerns relating to skills development. The second part addresses prominent issues and strategies that are emerging in the TVET and skills development sector in the countries of Asia and the Pacific region in response to the key challenges confronting them. The third part looks at the link between technical and vocational education and training and the imperatives of greening economies – if and how education and training are responding to green growth. The fourth and the last part draws together prominent trends to articulate an emerging framework for policy and action in the skills and training sector that development partners could consider in their future activities and investments.

Chapter 1 traces the trends and developments associated with skills development and the experiences of Asia in comparison with other parts of the world. Chapter 2 explores the issue of lifelong learning in the context of skills development. Chapter 3 discusses how secondary and tertiary education systems are incorporating vocational education and training. Chapter 4 articulates the important ecosystem that is needed for the successful translation of training into employment and occupations. Chapters 5 and 6 analyze the influence of movement of labor from rural to urban areas and the role of ICT and their implications for skills development.

Chapters 7, 8 and 9 elaborate upon the challenges in moving from technical and vocational education and training (TVET) to workforce development, in measuring skills and qualifications and appropriate models for skills development that permeate the large informal sector that is widespread in many parts of Asia. Chapters 10 and 11 provide insights into recent policy measures to address skill shortages particularly by engaging the private sector in India and in responding to underemployment and migration in South Asia. Chapters 12 and 13 dwell on the challenges

of rural-urban migration and aging populations and the manner in which skills training can mitigate negative consequences of such trends.

Chapters 14, 15, 16, 17, 18, and 19 address a range of issues relating to education and skills development in the context of greening economies, the realignment of curriculum toward green jobs, and the perspectives of employers in terms of skills required in a low-carbon economy.

The last chapter seeks to summarize selected prominent issues of discourse in the skills and training arena and outlines a draft framework for policy and action for skills development in Asia and the Pacific. As the discourse moves forward in the 2012 and 2013 skills forum, this framework is expected to further evolve and become more practically oriented.

On behalf of ADB, we are deeply appreciative of the contributions made by leading experts to this volume.

Jouko Sarvi and Shanti Jagannathan

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Series Editors' Introduction

Skills development for employability (often referred to as technical and vocational education and training) has been identified by countries in Asia-Pacific as a priority area for educational policy and practice. This is not surprising since there is overwhelming evidence to demonstrate that TVET can play an essential role in promoting sustainable economic growth and the socioeconomic development of countries, with benefits for individuals, their families, local communities, and society in general. Improving education for the world of work can help improve the incomes of poverty-stricken farmers, provide citizens with more choices in their lives, help alleviate poverty, and help empower individuals who would otherwise be marginalized. Technical and vocational education and training therefore has a major role to play in achieving inclusive and sustainable growth in developing Asia-Pacific.

One of the key skills challenges facing TVET concerns the greening of economies, as countries seek to address problems such as climate change and ways to best achieve sustainable, long-term development. The recent Rio+20 conference reminds us that despite the urgent nature of the problems faced, it is extremely difficult to achieve an international consensus on how best to address pressing issues such as global warming. The various chapters in this book examine research, policy, and practice concerning key skills challenges with particular reference to TVET, inclusive and sustainable growth, and the greening of economies.

For instance, climate change is generating economic and environmental dislocations with these pressures set to increase in the coming years. The Asian Development Bank estimates that the economic impact of climate change in Asia will be 2.5 times more severe than the global average by 2100 if carbon emissions continue at their current level. But these threats also provide opportunities to those countries and regions that address climate change by pursuing lower emission technologies since 'going low-carbon' will generate opportunities in green and energy-efficient technologies and applications.

Such actions will see a reengineering of established production techniques and will increase demand for climate-compatible goods and services. Those places that

best anticipate and respond to these needs will be positioned for significant positive growth in the years ahead. The chapters in this book contribute to a better understanding of the types of changes in policy and practice that will be necessary to take advantage of this potential. As ADB argues, a key factor in reducing the risks from climate change is better government and industry policy with regard to better coordination between agencies and between central and local government, and better research by all countries.

This book examines the theory and practice needed to enhance policy making to promote 'green skills' for 'greener economies' in countries throughout Asia-Pacific, especially through skills development for employability regarding technical and vocational education and training. The chapters identify green economy potential and associated workforce skills that are needed for countries in Asia-Pacific to create new and alternative economic opportunities through a shift to low-carbon technologies, and identify changes in TVET policy and management that are needed to respond to the skills needs of industry resulting from climate change. Taken together, the contributors help identify where existing occupations need to adapt as a result of sustainable development issues such as climate change and where new occupations will emerge. Based on these changes, future requirements for technical and vocational education and training can be identified.

Pathways to a low-carbon economy are often seen as a technical issue, requiring engineering knowledge and skills. However, the development of appropriate competencies in the general workforce to undertake other tasks that are the lifeblood of economies is also very important in meeting the challenge at hand. As industries and industry sectors reengineer their resource and energy inputs, supply chain management, logistics, design and construction of the build environment, production processes, services, water and waste management practices all have to be significantly altered to reduce carbon emissions. For these changes to economic practice to be achievable and sustained over a long period, the training of the general labor force must be a priority.

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Part I
Major Trends and Concerns in Skills Development

Chapter 1
Skills Development Issues, Challenges, and Strategies in Asia and the Pacific

Rupert Maclean, Shanti Jagannathan, and Jouko Sarvi

Introduction

The Asia-Pacific region is renowned for its size, diversity and complexity, whether it be geographical, socioeconomic, cultural, political or developmental, all of which impact on every aspect of life, including employment, labour force considerations, education and training. The region is home to some 63% of the world's population of seven billion. Countries with the largest populations (People's Republic of China, 1.34 billion; India, 1.22 billion) and the most rapidly growing megacities are to be found in the region, as are countries with relatively small populations (Bhutan, 695,000; Niue, 1,398) (UNDESA 2011).

Levels of economic development vary widely, with some of the richest countries (such as Japan) and some of the poorest countries on earth (such as Bangladesh). Asia contains the largest number of poor of any region in the world, the incidence of those living below the poverty line remaining as high as 40% in some countries in Asia (UNESCAP 2011). At the same time, many countries are experiencing a period of great economic growth and development. The growing prominence of Asian economies and corporations, together with globalisation and technological

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innovation, is leading to long-term changes in trade, business and labour markets. There is a rebalancing of power, centred on Asia and the Pacific region.

Asia's economies have achieved remarkable growth rates. If Asia continues to grow on its recent trajectory, it could, by 2050, account for more than 50% of the world Gross Domestic Product (GDP) (compared to 27% in 2010), with a sixfold increase in per capita income, to reach European levels of today. Seven economies – the People's Republic of China (PRC), India, Indonesia, Japan, the Republic of Korea, Thailand and Malaysia – are projected to account for 87% of the GDP growth in Asia and almost 55% of global GDP growth between 2010 and 2050 (ADB 2011b). A number of directions for economic development have been identified in the UNESCAP (2011) report:

- Trade within the region is growing more rapidly than the region's trade with the rest of the world, potentially leading to a deeper level of regional integration.
- Services are an important emerging sector, and various developing Asia-Pacific economies are leading the recovery in exports of commercial services, with the group recording on average a growth rate of more than 20% in 2010. There is scope to expand intraregional trade in some services.
- Some Asia-Pacific countries are already world leaders in the production and export of climate-smart goods and services.
- It is important to include small and medium-sized enterprises (SMEs) in the exports of Asia-Pacific economies, as they play a crucial role in creating employment.
- An increase in regional cooperation is also viewed as a major avenue for regional development.

However, realising the 'Asia-Pacific Century' is dependent upon countries in the region being able to sustain growth, reduce poverty and ensure inclusiveness in the distribution of gains. On the one hand, it is crucial to address inequities, while on the other, it is important to implement strategies for productivity gains so that countries are not caught in a 'middle-income trap' (World Bank 2007). The notion of a middle-income trap refers to a well-established economic principle whereby a developing nation gets 'trapped' when it reaches a certain, relatively comfortable level of income but cannot seem to take that next big jump into the true big leagues of the world economy, with per capita wealth to match. Every economy in Asia has confronted this 'trap' or is dealing with it now. Breaking out of it is extremely difficult since escaping the 'trap' requires major re-engineering which includes skills development for employability and sustainable livelihoods.

Asia also faces demographic challenges – some economies have a predominantly working age population, while there are economies that will be confronted with an aging, large elder population (UNDESA 2011). The case of the Asian giants, the PRC and India, is particularly interesting and significant. Being the world's two most populous countries, together they represent 36% of the world's population. These populations will continue to increase with India and the PRC having predicted population growth rates of 1.32 and 0.42%, respectively. GDP growth forecasts for India and the PRC in 2012 are 7.5 and 9%, respectively (International Monetary Fund 2011a, b). Large-scale migration to urban areas is a major feature in both countries, this being particularly the case in the PRC. This is fuelled by a desire for

improved employment opportunities and higher standards of living (UN Population Fund 1999).

In Asia, the informal sectors take up 65% of nonagricultural employment. Together with informal employment in agriculture, the proportion of informal employment significantly increases, in India, for example, 'from 83% of non-agricultural employment to 93% of total employment' (Asian Development Bank 2011, p. 1). Skills development for the informal sector presents specific challenges to governments.

A deeper level of economic integration, which is required for sustainable development, calls for regional cooperation in skills development. Although challenges for HR development vary from country to country, the overall directions for the region could be identified based on the assumption that countries need to progress towards aligning skills development strategies with socioeconomic goals. The Asian Development Bank has a competitive advantage to support countries in the region in formulating skills development strategies and in increasing regional cooperation in TVET through formulating overall priorities. In this chapter, an example of European Union (EU) regional cooperation in TVET and key challenges and current TVET trends in Asia and the Pacific are considered, and a framework to move forward to support TVET in the region is suggested.

Global Issues: Skills Development for Employability (TVET)

In this chapter, skills development for employability, which stresses practical, technical and vocational, rather than largely academic knowledge, skills and understandings shall be referred to as technical and vocational education and training (TVET).

Over time, and in different countries, various terms have and are being used to describe elements of the field that are now conceived as comprising TVET. These include apprenticeship training, vocational education, industrial arts, technical education, technological-vocational education, occupational education, vocational education and training and career and technical education. At the second International Congress on Technical and Vocational Education, held in the Republic of Korea in 1999, UNESCO and the ILO (in consultation with their respective member states and partner agencies) jointly agreed to use the term technical and vocational education and training (TVET)[1] in future in order to unite the field.

TVET is very much back on the global educational agenda after its virtual disappearance from international aid in the early 1980s, when the World Bank radically shifted its policy from TVET support towards investment in primary education. A return of TVET to the development agenda is partly a reaction to the emerging skills divide with the least developed countries falling further and

[1] The definition of TVET that has been most widely adopted is 'Those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupants in various sectors of economic and social life' (UNESCO 1999).

further behind, particularly in sub-Saharan Africa and South Asia. Currently, TVET is regarded as important to achieving relevant and high-quality education for all (EFA), education for sustainable development (ESD) and the Millennium Development Goals (MDGs) and is also viewed as part of the lifelong learning agenda (King 2011).

There is overwhelming evidence to demonstrate that TVET can play an essential role in promoting sustainable poverty alleviation, human development and economic growth, with clear benefits for individuals, their families, local communities and societies in general (Maclean and Wilson 2009, Chapter 1; NORRAG 2003). This is to be expected since it is estimated that some 80% of occupations centre on the application of technical and vocational skills to the world of work (UNESCO-UIS 2006). The World Bank (2010) highlights the importance of skills for individuals and economies as 'skills are at the core of improving individuals' employment outcomes and increasing countries' productivity and growth' (p. 1). UNESCO's strategy on TVET (2008) stated that more and more governments are calling for assistance in TVET development (UNESCO 2011). TVET has been identified by the international community and ADB member states in Asia and the Pacific as a priority area within ADB's range of programme activities.

TVET refers to education and training that prepare people for gainful employment (Finch and Crunkilton 1999). TVET can take place either in formal schools (e.g. from kindergartens to grade 12 or 13) or increasingly in postsecondary community and/or technical colleges or informally by means of training at the workplace and increasingly by distance learning. In many developing countries, most TVET skills development for employability occurs through informal and nonformal means, rather than in formal TVET institutions (UNESCO-UIS 2006; 2010).

Investment in TVET is not without its critics (Maclean and Wilson 2009). Some politicians and policy makers point to the heavy expenses required to develop curricula, training staff and equip classrooms for specialised TVET subjects in secondary schools or postsecondary learning centres, which can generally cost three times more than academic courses. Also the fact is that TVET provides training, but no guarantee for jobs. According to the World Bank report (2010), 'the global imperative for more jobs, and more productive jobs, is a major challenge for development. Global unemployment, estimated by the ILO at 212 million in 2009, is at an all-time high' (p. 1). A jointly prepared ILO and OECD statistical report has noted that 'all G20 countries are facing substantial labour market challenges to promote productive employment and decent work opportunities for all' (ILO and OECD 2011, p. 1). The report has indicated that 'in the context of rapid technological change and globalization, another priority has been to improve labour market prospects for the low-skilled, especially in the more advanced economies' (p. 8). Better integration of youth, women and migrants into the labour market is also viewed as key issues. TVET has moved from beyond the narrow confines of economic planning and become part of a larger vision for promoting sustainable development in the region.

An Example of Regional Cooperation: EU

The ADB Asia 2050 report identified a number of reasons for the growing importance of regional cooperation for Asia and exemplified areas that would benefit from cooperation (e.g. transport, health, food security). The move towards economic cooperation needs to be accompanied by HRD strategies and skills development. Systematic developments in TVET cooperation in Europe could serve as an example of such cooperation, although strong supranational institutions in Europe are unique. Systematic strategies at the policy level, and the development of common tools and principles for TVET, are an indication of the recognised value of cooperation on common priorities. The need to ensure the quality and relevance of education and training has been reflected in policy development since 2002 when the ministers responsible for TVET and social partners committed themselves to cooperation in TVET, making TVET in the EU region the best in the world.

There has been a change in EU region priorities, reflects the change of HRD policy orientation and the setting of goals. The most visible part of the Copenhagen process concerns the development and implementation of European TVET tools. Such instruments as Europass (a framework for transparency of qualifications and competencies), EQF (the European Qualifications Framework) and ECVET (the European credit system for vocational education and training) have impacted transparency, comparability and the quality of TVET. In particular, the EQF serves as a common European reference system that is aimed at linking different countries' national qualifications systems and frameworks together, so it can function as a mapping device helping learners and workers to 'move between countries or change jobs or move between educational institutions at home' (EC 2008, p. 3).

The European Qualifications Framework classifies 'knowledge', 'skills' and 'competence' into eight levels. Common reference points help Europeans to collect reliable statistics to be able to forecast skills demands. The EQF provides a means of comparing qualifications in different European countries.

Almost all EU and European Economic Area (EEA) countries have indicated their intention to introduce NQFs covering all parts of their education, training and qualifications system.[2] One of the main reasons for the development of NQFs was the establishment of the European Qualifications Framework for Lifelong Learning. This was adopted in 2008 by the European Parliament and Council. Since the mid-2000s, NQFs in Europe have become the key instruments for reforming education, training and qualifications systems. The majority of EU, EEA and candidate countries are now working on the development and implementation of national frameworks. In Belgium, Flanders, Estonia, Lithuania, Malta and Portugal, formal

[2] According to the CEDEFOP (2010) report, of the 32 countries having signed up to the EQF, Lichtenstein is not developing NQF for LL. Lichtenstein is, however, developing a framework for HE in line with the Bologna process. A total of 34 NQFs are covered by the analysis. The UK has separate NQFs for England/Northern Ireland, Wales and Scotland, and Belgium is developing separate frameworks for Flanders and the French-speaking community.

adoption has been achieved. The UK, Ireland and France, which are the countries with established frameworks, have carried out, or are in the process of carrying out, reviews (CEDEFOP 2010).

The development of NQFs confirms that the EQF is regarded as an important reference system for individual countries. Most countries have (or will) use an eight-level structure and have used the EQF level descriptors as the starting point for their national work. While NQFs are important to achieve European objectives, they are also regarded as a means of achieving national objectives. NQFs are generally seen as a means of clarifying the relations between the different parts of a national system. The objective is to make national qualifications easier for national citizens and migrants to understand. Experience in Europe has shown that NQF development is a highly political process that can result in conflicting interests (CEDEFOP 2010).

To what extent European experience could be applicable to Asia-Pacific as the socioeconomic challenges are different in these regions? For Europe, a forecast on skills demand and supply up to 2020 identified three major requests:

- Developments in skills supply towards a more highly qualified workforce
- Continued sector trends towards jobs in services
- Dominance of knowledge and skills intensive jobs (CEDEFOP 2010)

For Asia and the Pacific, skills demand and supply vary greatly within subregions since they are facing different challenges (such as higher urbanisation rates in East and North East Asia; unemployment has been highest in North and Central Asia; poverty is most severe in South and South West Asia (UNESCAP 2011)).

Although the socioeconomic challenges in Europe and Asia are not the same and the demand for changing skills needs is somewhat different, overall directions towards regional cooperation could provide a long-term goal for TVET development in Asia. This involves such needs for TVET development as:

- Reinforcing links with the labour market
- Improving the effectiveness of governance and financing of TVET
- Raising the attractiveness of TVET
- Increasing access to TVET by addressing equity issues
- Lifelong learning through TVET
- Improving the quality of TVET
- Improving available statistics and performance indicators for evidence-based decision making

These matters are just as relevant to Asia as they are to Europe. Therefore, the European model provides a useful example of a regional framework for cooperation which can be a role model for Asia-Pacific, with necessary changes or adjustments being made to accommodate local contexts.

Main Issues, Concerns and Challenges Regarding TVET in Asia and the Pacific

An Overview

The critical importance of investing in TVET to promote social, economic and ecological development has been acknowledged in the region. Therefore, recent developments and concerns in TVET can be viewed through a prism of TVET's *economic, social and environmental relevance and its internal efficiency and quality*. Main achievements in TVET are observed in policy development and planning that address the issues of the relevance and efficiency of TVET. Governments in the region have recognised the need to create comprehensive skills development and training policies that include initial, and continuous, TVET to meet the needs of the labour market and to enhance economic growth. The governments of Pakistan, Timor-Leste and India have developed and adopted national skills policies along these lines. The governments of Bangladesh, Mongolia, Tajikistan and Pakistan are in the process of developing comprehensive skills strategies (ILO 2011).

Countries at different stages of economic development require different levels of skills development. UNESCO's statistics demonstrate the relative importance of *formal* TVET in the context of education system at the upper secondary and tertiary levels (Table 1.1).

The share of TVET students at the upper secondary and tertiary levels over the past 10 years has changed and is related to specific pathways of economic development in each country (such as the rapid expansion of knowledge-led sectors, e.g. the PRC; industrialisation, e.g. Viet Nam; the lack of employment opportunities after secondary TVET, e.g. Lao PDR). Due to the increasing emphasis many countries put on TVET, they also set very high targets for enrolment in secondary vocational programmes (UNESCO 2012). For Indonesia and the PRC, these targets were 70 and 60%, respectively (Copenhagen Development Consult A/S 2005, p. 7), India (12.6% in 1999) targeted 25% (World Bank 2006b), and Bangladesh (0.7% in 1999) set a target of 20% of all secondary students to be enrolled in the vocational/technical secondary

Table 1.1 Countries with highest and lowest TVET enrolments at secondary and tertiary levels

Upper secondary				Tertiary (5B)			
Highest countries		Lowest countries		Highest countries		Lowest countries	
Uzbekistan	81.0	Lao PDR	1.1	Lao PDR	60.9	Mongolia	2.4
PRC	42.6	Nepal	1.7	PRC	44.6	Pakistan	5.1
Thailand	39.9	India	1.8	Malaysia	43.3	Philippines	9.6
Indonesia	37.2	Afghanistan	2.7	Singapore	42.3	Kyrgyz Republic	14.7
Kazakhstan	26.0	Bangladesh	8.1	Viet Nam	33.5	Thailand	15.5

Source: UNESCO-UIS Database (2010) and UNESCO (2012)
Note: Lao PDR = Lao People's Democratic Republic; PRC = People's Republic of China.

stream (World Bank 2007a). Pakistan has planned to add technical vocational streams in secondary education with a 50% target (World Bank 2006a). Implementation challenges associated with these reforms need to be carefully planned to be successful. In 2009, the PRC, with its highly planned economy, achieved 47.1% of TVET enrolment.

Although a formal, school-based training is getting more attention from governments, it enrols fewer trainees than either nonformal training or enterprise-based training (ADB 2009a). Considering the importance of informal employment in Asia,[3] it is possible to suggest that nonformal training is playing, and will continue to play, an important role in skills development in the region.

The recent UNESCO Bangkok report on the regional development of TVET in Asia and the Pacific (UNESCO 2012) identified a *progress towards strategic alignment of TVET with national socioeconomic goals* in terms of expansion of government TVET strategies and a movement from a supply-driven to a demand-driven TVET system, as the major directions of TVET development in the region.

The World Bank (Powell and Lindsay 2010) confirms these findings. The World Bank analysed the success stories of Singapore, Hong Kong, China, Republic of Korea and Viet Nam and noted that certain economic conditions such as:

- Macroeconomic stability
- Sustained growth in productivity
- Significant investment in technology
- Continued investments in human resources development

should be present for a country's economic development. However, while these qualities may be necessary for rapid growth, they in no way ensure rapid growth, or even ensure any growth at all, of a national economy. Many other nations also share these macroeconomic characteristics, but they have not yet experienced similar growth trajectories.

The importance of specific government guidance, planning, policies and interventions is essential. Markets alone 'cannot in a timely manner coordinate education and training for people so that skilled workers are available in the labour market when employers need them. Markets fare even worse when planning for long-term future needs is necessary, not just in terms of what skills are going to be in demand in the labour market, but what sectors will be the growth sectors in the medium and long term and what skills will be needed by them then' (Powell and Lindsay 2010, p. 16).

Hence, there is a need to support governments in skills development planning and policy formulation, aligned with socioeconomic development, which is essential for the ADB action agenda.

[3] Among five countries that concentrate three-quarters of the total informal employment estimated for the group of 46 medium- and low-income countries globally (ILO 2011), three are from Asia – India, Viet Nam and Pakistan.

Box 1 Success Stories from East Asia

Success stories from the East Asia (Powell and Lindsay 2010) provide examples of achievements by the countries:

Singapore
Though Singapore is a unique country, other nations can use Singapore as an example to assist them in designing their skills development and catch up strategies, because that is exactly what Singapore did. Singapore looked very closely at where they wanted to go, which sectors they wanted to focus on and what assets they had as a nation. They then used off-the-shelf education, skills development and industrial promotion policies, which they adapted to their national context, to very rapidly develop and catch up with more developed countries

Hong Kong, China
The way in which courses are funded also has an impact on student supply. For instance, where there is high economic demand for a particular programme of study and one that requires high capital investment, tuition fees will be paid by the state. However, in subject areas where demand is high and there is no capital investment, such as accounting or business studies, the state will not pay tuition fees. This strategy ensures that state investment occurs in strategic skills areas that the private sector would not support.

Republic of Korea
The experiences gained provide notable policy implications for other countries which aim to transform their economies and industrial structure. These are the following: (1) There must be close congruence between skills development systems, government's role and the stages in economic development. (2) While it is difficult and inefficient for government to directly control the whole process of skills development, government does have a role to promote the behaviour of stakeholders to the advantage of social and national goals. (3) Participation of social partnership between stakeholders is becoming more important; skills development systems exclusively regulated by the state fail to meet actual needs of firms. (4) Higher education for the masses was achieved without significant secondary level VET. This illustrates that late specialisation is possible and that a combination of general education and in-plant training may be efficient models in a high growth economy. (5) Maintaining a balance between quantitative expansion of the skills base and issues of equity and growth is possible.

Key Issues in Asia and the Pacific Region

Given the very broad coverage of skills development for employability with regard to the issues, concerns and challenges confronting policy makers, practitioners and researchers,[4] a survey was conducted by The Hong Kong Institute of Education (August 2011),[5] of internationally renowned TVET experts, to ascertain their views on what they regarded as being the key issues concerning TVET in the Asia-Pacific region. These main issues were discussed at the ADB International Forum in Manila, 12 and 13 December 2011. These challenges are referred to in the section below and are examined in a comprehensive way in the various chapters that appear in this book.

Public–Private Partnerships (PPP) and the Financing of Skills Development for Employability Including Responses to Demand-Side Forces and Industry Partnerships

Although the role of governments is extremely important in setting up policies for skills development, it is essential to include public–private partnerships in TVET development and delivery. Analysis by ADB (2010) identified a wide range of public–private partnerships in use in education and training. The growth of PPPs in Asia and the Pacific can be observed in the region, as the private providers help governments to improve the quality of skills development, increase access for the disadvantaged and enhance relevance and the linkages of TVET to labour market needs. As analysed by ADB (2010), many governments are exploring options and developing mechanisms to involve the private sector in both the supply and demand sides of TVET provision. From the supply side, the public sector funds the operation of private TVET institutions (vouchers, subsidies, grants, stipends), while from the demand side, the mechanisms to promote parental choice, competition and accountability are in place. These measures ensure increasing enrolments, improving educational outcomes and enhancing equality in access. To boost the PPPs, the governments need to strengthen the capacities of their public agencies to regulate, monitor and contract private TVET providers; develop the capacities of private providers to deliver quality TVET by facilitating access to capital; improve

[4] The most comprehensive overview to date of the content of TVET is provided in Maclean and Wilson (2009) and Rauner and Maclean (2008).

[5] Those surveyed were: Kenneth King, University of Edinburgh; Steven Lamb, University of Melbourne; Shyamal Majundar, UNESCO-UNEVOC International Centre; Young, UNESCO Bangkok; Chris Chinien, Workforce Development Consulting, Canada; Director and staff, Colombo Plan Staff Training College; Margarita Pavlova, Griffith University; Karina Veal, International Consultant on TVET.

educational and management practices, and create structures/institutions that assist in establishing and the implementation of PPPs.

Based on its experience in the region, ADB (2010) identified the following lessons learned from empirical evidence in Asia and the Pacific:

- Improve the perception of the role that private sector plays for the public benefit.
- Allow not-for-profit and for-profit education and training providers to operate.
- Promote and facilitate foreign direct investment in education.
- Develop clear and objective establishment criteria and streamline processes for registering private education providers.
- Provide subsidies to the private education and training sector.

Strengthening of PPPs would be also helpful for developing skills for the innovation and technology sectors. Skills development for employability is an important area for PPPs as it is essential to adopt a multidimensional approach to TVET to increase quality, effectiveness and access.

National Vocational Qualifications Frameworks and Sector Skills Councils

Governments in over 100 countries are designing, implementing or considering national qualification frameworks (NQFs) or are involved with regional qualifications frameworks (Allais 2010). The development of NQFs is underpinned by the idea that all qualifications can (and should) be expressed in terms of outcomes, without a prescribed learning pathway. International interest in NQFs has arisen because of issues concerning the relevance, flexibility and portability of skills and training and the effects on employment opportunities. Countries have adopted different approaches to NQFs, but the underlying motives driving the process are usually similar. These include the need to strengthen links between education, training and the labour market; the need to ease the process of labour mobility across employment sectors, regions and countries, including lifelong education and training; recognising prior learning experience and credits; setting standards based on learning outcomes; facilitating quality assurance; and improving the perceived status of TVET (Allais 2010).

In the mid 1990s, Australia, UK, New Zealand and South Africa initiated work on NQFs. In the late 1990s and early 2000s, some Caribbean and Latin American countries developed NQFs, usually using the UK model. In the late 1990s, considerable work in the EU was achieved, led by the Bologna Process of harmonising higher education systems (Austrian Federal Ministry of Science and Research 2009). This process removes specialist educational institutions from the centre of the system and places the learner, and the opportunity to gain qualifications, at the centre. One key difference between NQFs and traditional systems in terms of implementation is that they are designed independently of delivery and are based

on a set of levels, standards and outcomes. An outcome-based framework is really an assessment system and does not relate to provision. Most people within the system need guidance and the provision of education, and hence, this requires institutional arrangements with associated curriculum, teaching and learning.

NQFs do not arise from specific needs, but as a result of a decision to develop a framework that encompasses as large a proportion of the population as possible and covers many sectors. *These are top-down frameworks that must be driven by governments and government agencies*. Hence, there is need to support governments in this reform.

Many ASEAN countries are experiencing the challenges of rapid development, structural reform and high levels of labour mobility. These can only be met through flexible education and training systems with efficient skills recognition processes. Most ASEAN countries lack comprehensive NQFs, although Singapore, Indonesia, Thailand and Malaysia have developed full or partial frameworks which are broadly similar to each other and Australia's NQF. The absence of comparable NQFs prevents efficient qualification recognition across borders, which in turn limits trade and investment in services, including education services and the movement of migrant workers. This negative impact is greatest in the least developed economies which particularly need to build human capital through the provision of quality education and subsequent skills and widely accepted qualifications. Beyond the ASEAN countries in Asia and the Pacific, Hong Kong, China, Australia and New Zealand have implemented NQFs. The Republic of Korea is in the process of implementing NQFs, and five other nations have NQFs under development or consideration (APEC Human Resources Development Working Group 2009).

Regional Model Competency Standards have been developed and implemented in Bangladesh, Indonesia, Lao PDR and Thailand to foster mutual recognition of skills and qualifications. A number of countries have used Regional Model Competency Standards in key sectors (manufacturing, tourism, construction, agriculture) (ILO 2006).

The *Mapping of Qualifications Frameworks across APEC Economies* report concluded that the NQFs in APEC economies were diverse in their structure, coverage, operational purposes and governance. They all aimed to provide greater transparency for qualifications, support for skills standards systems, and a means of managing quality assurance and to facilitate the international recognition of qualifications. Some economies used the NQFs as a basis for credit systems for transfer across education and training levels and institutions. Five APEC countries have NQFs covering senior secondary, vocational education and higher education qualifications, but there were differences in the framework across the sectors. In Singapore, the framework applied only to vocational education and in Thailand to higher education. In 2007, India made the decision to limit the framework to the TVET sector, rather than develop a more inclusive NQF (World Bank and ILO 2011).

The education and labour departments of governments usually take responsibility for qualifications. In several countries, NQFs have emerged from the TVET sector associated with the developments of industry skills standards and

competency standards-based qualifications. The introduction of competency-based training has been associated with a relative shift in control of the content of training from providers to industry (World Bank and ILO 2011).

Sector Skills Councils (SSCs) are another important means to develop dynamic and demand-based TVET planning. These help establish a common understanding of skills required for specific occupations, in particular the need to match the requirements of the labour market through the links between TVET providers and industry. These are usually state controlled but involve employer-led organisations that monitor training and qualifications in specific economic sectors. The overarching objectives of SSCs are[6]

- To reduce skills gaps and shortages and to provide advice on skills needed to the TVET system
- To be involved in the development of standards
- To improve productivity
- To boost the skills of their sector workforces
- To improve learning supply

In the UK, there are 22 SSCs[7], covering approximately 85% of the British workforce. Internationally, there is the International Network of Skill Sector Organisations which comprises the members Australia, Canada, India, Netherlands, New Zealand, Pakistan, South Africa and the UK[8]. These countries take a leadership role in promoting the SSC concept and the development of occupational standards.

Many countries in the Asia-Pacific region, and worldwide, have expressed an interest in developing NQFs and establishing Sector Skills Councils (SSCs) and believe that there will be many benefits. Issues of interest include the relevance of European models to Asia, the role and limitations of NQFs and country and regional experiences. An issue of considerable interest is how countries have overcome the traditional resistance to NQFs, such as resistance from trades unions, a lack of teachers/trainers with national qualifications and employers' acceptance of such standards. Another matter of importance concerns the role of SSCs and whether this is a proven model for the implementation of NQFs. The experiences of moving from national to regional NQFs are also important (Young 2009).

Green Growth and Skills Development for Employability

At the international level, a clear link between TVET, environmental conservation and sustainable development has been expressed in 2004 in the Bonn Declaration (UNESCO-UNEVOC 2004) that was reached after deliberations by 122 experts

[6] Department of Business Innovation and skills, UK no longer in existence:

[7] Alliance Sector Skills Councils, UK. http://www.sscalliance.org/HomePublic/AbouttheAlliance/About_the_Alliance.aspx

[8] International Network of Sector Skills Organization. http://insso.org

from UN member states who met in Bonn, Germany. Pressure to train for green economic restructuring directly relates to issues of climate change and move to a low-carbon emission.

Pathways to a low-carbon economy are often seen as technical issues, requiring engineering knowledge and skills (McKinsey and Company 2009). Clean technology has become the fastest growing sector in venture capital and private equity investment. In Hong Kong, China, the top 10 banks have committed 10–15% of project finance to renewable and clean technology (The Climate Group 2008).

However, the development of appropriate skills in the general workforce is also necessary for meeting this challenge. As industries re-engineer their resource and energy inputs, supply chain management, logistics, design and construction of the built environment, production processes, services and water and waste management, current practices have to evolve in order to significantly reduce carbon emissions.

The Asia Business Council report (Asia Business Council 2009) predicts that the number of green jobs created by 2030 could reach 100 million worldwide, which is estimated at 2% of the future workforce. Some of these green jobs will be new jobs, while others will be substitutes for existing jobs. Potentially, Asia could have 50 million green jobs, and many jobs in existing industries would require green skills as manufacturing industries may change their production processes or develop green products. Potentially expanded production capacity along with supply chains, and new servicing needs, would indicate that green skills will become an essential part of the future.

TVET has a great responsibility to train workers in these new skills. This involves the training systems in different countries understanding, and anticipating, the needs of future employers, having the flexibility to adjust and so provide appropriate TVET in a timely manner and to adjust to changes in jobs that currently may not appear to require green skills but will in the future. It is clear that countries in the Asia-Pacific region will need to develop policies, training programmes and green skills qualifications frameworks and maintain close links with TVET providers. A UNESCO report (UNESCO 2012) highlights that multiple initiatives across the region (in Bangladesh, the PRC, India, Indonesia and the Philippines) are in place to train for green jobs.

Although green growth is a relative newcomer as a driving force for employment and training, it has become clear over the last few years that many jobs are changing as green skills are introduced. Production and service industries are reacting to the need to reduce energy consumption and waste, as the costs of fuel and raw materials increase. It is important to consider best practices for investing in skills training to meet the demands of a greening economy and how TVET institutes can understand and react to industries' requirements: for example, how to teach sustainable work practices, environmental management systems and sustainable resource reduction strategies and solutions to the difficulties faced by TVET providers in changing curricula due to the capital investment necessary in equipment and teachers. It is also relevant to consider the emergence of entirely new 'green jobs' such as those related to the development, manufacture and operation of renewable energy generating equipment, green accounting, carbon trading and carbon auditing.

Vocationalisation of Education and the Reorientation of Skills Development for Employability Through Lifelong Learning

Lifelong learning has emerged as one of the keys to improving the quality of life in the twenty-first century.[9] An initial education is no longer sufficient to enable people to benefit from new opportunities that advances in science and technology bring and other changes in the world of work. There is no doubt that continuing to learn is the key to securing employment and income stability. Higher levels of formal education and training lead to higher incomes and greater employability. Rates of return (RoR) studies have included both educational attainment and skills measures while taking account of other variables such as gender, occupation, work experience and geographic location (OECD 2005, 2007). These studies show that the main reason that well-educated and trained individuals earn higher incomes is that they have higher knowledge and skills levels, or put simply, higher qualifications are a proxy for more skills.

Lifelong learning goes beyond formal education and training to include 'skills development'. This is an umbrella term to describe the ways in which individuals continue to learn and acquire skills and competencies which influence employment and earnings potential (Adams 2011). Schools, higher education and TVET institutions engage in skills development for work, but just as, or even more, important, are apprenticeships, enterprise-based training, professional development, informal learning in the workplace, and government and nongovernment training programmes. Vocationalisation of secondary education provides a foundation for lifelong learning in skills development for employability. As argued by many, it is desirable and appropriate that secondary schools are more accountable for developing the economic and labour force needs of society through placing a greater emphasis on skills development for employability (Maclean and Wilson 2009; Rauner and Maclean 2008; Fien et al. 2008). The social function of vocationalisation resulted in the opportunity for young people to stay in school longer than might have been possible if only an academic curriculum were offered.

Previously, the notion of 'vocationalisation' was only related to inclusion of vocational content into general education programmes or to prevocational or pretechnical education programmes. Current trends are to 'new vocationalisation' that also includes vocational or technical education programmes that prepare participants for direct entry into specific occupations (Maclean and Pavlova 2011). The demand to enhance productivity and employability brings this vocational element at the secondary school level under the umbrella of 'vocationalisation', together with general and 'prevocational' options. The main reason for this is that in some contexts, TVET development at the level of secondary education can bring a maximum effect in increasing the employability of graduates. At the same time, more general education is included in the TVET stream, and the distinction between academic and vocational

[9] This section on lifelong learning draws on the Background Concept Paper by Power and Maclean (2011).

is blurred across all three categories. Functional aspects of this training, relevant to labour market needs (e.g. technological knowledge, flexibility, better productivity), become increasingly more important than educational achievements. Therefore, a call by ADB in 2008 (Asian Development Bank 2008) for a shift from traditional TVET approaches to context-related world-of-work competences could be interpreted as a broadening of the notion of vocationalisation by including secondary TVET. The change is away from an education-driven to a functional model of skills development, at the secondary level.

At the tertiary level, there has been a transformation of higher education in the past two decades as a result of the massification of higher education. The numbers of students in tertiary education worldwide doubled between 1991 and 2004 and continues to grow, particularly in high-population countries such as India and the PRC. The number of tertiary students has further increased between 2005 and 2009 by 21% in the PRC and 25% in India (UNESCO Institute of Statistics 2010). For other countries in East Asia and the Pacific, the increase has been 9%, while for North America and Western Europe, there has been little overall change over this period. As student numbers have risen dramatically, an increasing emphasis is being placed on skills development for employability which has resulted in the vocationalisation of higher education (Maclean and Wilson 2009).

The boundaries between academic knowledge/work and vocational knowledge/work have become blurred. As more people are engaging in higher education, there is a need to accommodate a more diverse range of interests and abilities. Many students want courses that are of a vocational nature to prepare them directly for the world of work. The massification and vocationalisation[10] of higher education have profound implications for what knowledge is regarded as being of most worth in tertiary institutions. At the political level, the detachment of university degrees and their academic curricula from the labour markets could be regarded as a negative aspect of university development (Pavlova 2005). Academically, education detached from reality was regarded as providing insufficient skills for appropriate employability of university graduates. The challenge is to link higher education with the constantly changing needs of society, and this is seen as an increasingly important issue by universities and politicians (European Commission 1995). Creating a fruitful and dynamic partnership between higher education and society has become one of the basic objectives of universities.

In terms of development skills for employability through the lifelong learning framework, continuous TVET includes employer-led training, adult training programmes and informal training. Formal learning is getting more and more inclusive of informal and nonformal learning to vocationalise education by devising most effective ways in which education institutions can best prepare learners for the

[10] By vocationalisation, we mean a way of empowering individuals through development of their capabilities and providing them with an opportunity to orient and adapt for the work environment. The main goal of vocationalisation is to improve the vocational relevance of education. Usually, vocationalisation means the introduction of practical and/or vocational subjects, industry visits, vocational guidance and more applied way of teaching general education subjects.

world of work and for a smooth transition from education institutions into the world of work. As a result, programmes aimed at skills development for employability increasingly stress learning which is lifelong and life-wide. The move to vocationalise secondary and postsecondary education can be achieved through adopting a lifelong learning model which represents a major paradigm shift in how best to achieve skills development for employability and sustainable livelihoods. Multiple pathways between vocational and academic education, as observed in the region, provide additional opportunities for learners in skills development.

Skills Development for Employability and Inclusion: Expanding Opportunities for Youth and Other Marginalised Groups and for Poverty Alleviation and Equity

One function of TVET is social. For individuals with low skills levels, having the opportunity to acquire skills for employability at strategic points throughout their lives is a crucial factor in improving their prospects for gaining employment and a secure income and thus in combating poverty and improving the quality of life for themselves and their families. Many education and development policies are based on the assumption that literacy and primary education play a key role in poverty reduction, while higher education is crucial for economic development in the global knowledge society. While both of these are true, evidence is also mounting that all levels of education and types of training (formal and nonformal) can contribute to both these things: that is, learning throughout life is the key to sustainable development and poverty alleviation. For example, work in India indicates that higher education not only contributes to economic development (in India), but it also makes a significant contribution to a reduction in absolute, as well as, relative poverty and particularly to increasing life expectancy and reducing infant mortality (Tilak 2007). When higher education institutions use their expertise to work with schools serving poor communities and act as their advocates, progress can be made in combating poverty, raising the basic skills levels of both children and adults, improving crop yields and improving health and nutrition (Arini et al. 2007).

The effectiveness of training programmes for the unemployed is different across countries. For instance, in developed countries, generated employment for trainees is only 38% of cases and raised the incomes of the unemployed in only 23% of the programmes. Within these totals, however, better results were reported for women in general and for training programmes that started before mass layoffs (ADB 2009a). For transition economies, results for programmes were better in securing employment for graduates. This may reflect the economic situation affected by structural change when jobs are available at the end of the training.

Enhancing the level of skills among vulnerable groups such as the unemployed (and in particular, youth), rural and informal economy workers who are difficult to

reach (a large proportion of whom are women and people with disabilities and low-income families) is regarded by many governments as the means to break the cycle of low skills, low productivity and poverty. Considerable effort is being deployed by the countries to increase the participation of disadvantaged target groups in the region.

Soft Skills, Including Values and Ethics, as Part of Skills Development for Employability

Although there is an increasing emphasis on skills for employability (implicitly understood as workplace skills) because of what is often the highly specialised nature of TVET, there is a danger that 'life skills' will not be developed. The workplace is not just about production or service: ethics and values also have an important role to play so that workers are aware of, and can distinguish between, ethical and unethical behaviour in the workplace. It is important for young people to develop a personal code of work ethics and to be able to solve ethical dilemmas in the workplace. An understanding of labour rights and an understanding of the ethics of corruption and bribery are important workplace 'soft' skills. There is also a need to consider TVET's role in developing noncognitive skills that are also important for employment and self-improvement, such as the noncognitive skills of self-worth, confidence and motivation.

Soft skills are defined differently across countries. In Australia, for example, the Australian Chamber of Commerce and Industry and Business Council of Australia define these skills as *employability skills*, 'skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions' (2002, p. 3). This framework identifies eight main employability skills.[11] These 'employability' skills have a broader application as they are relevant to a variety of tasks in personal, social and work contexts. These skills can also help individuals to cope with change (Callan 2003). Employers are looking for employees who are adaptable and who have skills beyond technical (Maxwell 2010); 33.1% of employers consider employability skills to be the most important factor when employing graduates (Australian Industry Group and Deloitte 2009). Their multidimensional nature comprising of 'know-how, analytical, cultural and communication skills, and common sense' can help to provide an active and reflective approach to life for the employees (Allen Consulting Group 2004).

[11] Communication, teamwork, problem-solving, initiative and enterprise, planning and organising, self-management, learning and technology.

Employers want employees who are creative problem-solvers and innovators who are constantly updating their knowledge and expertise. The development of appropriate values and ethics through TVET has not been well documented in the region, and so specific projects and research are required to fill this information gap.

Quest for Improved Frameworks for Skills Development

Different agencies and organisations have variously developed their approaches and conceptual frameworks for skills development. For example, a conceptual framework for *Skills Toward Employment and Productivity* (STEP) has been established by the World Bank (2011). It includes a series of steps to get children off to a good start, 'ensuring that all students learn, building job-relevant skills that employers demand, encouraging entrepreneurship and innovation and matching the supply of skills with demand'. It is based on the concept of lifelong learning.

The Asian Development Bank (2008, p. 26) in its report *Education and Skills: Strategies for Accelerated Development in Asia and the Pacific* depicted the economic and social rationale for TVET. The report highlights the importance of skills development to increase productivity, alleviate poverty, increase human capital in ways which complement 'physical investment', initiate technological and structural change and attract foreign direct investment. ADB has recognised the importance of the Human Resource Development (HRD) strategic framework and action plan for the region (Asian Development Bank 2009b). Following the work of the Working Group on Human Resource Development (WGHRD) established in 1995 at the Fifth Ministerial Conference of the ADB member states, the 2007 midterm review of the government member states (GMS) strategic framework noted that, 'although the WGHRD has addressed key HRD concerns in GMS, programme development and implementation has been essentially project-based and lacks a clearly defined strategic framework' (ADB 2009b, p. 1) to address key HRD concerns and issues in education and skills development, labour and migration, health and social development. Among the main objectives of the Working Group on HRD are to:

- Promote investment in people
- Identify and prioritise key human resource issues and problems
- Exchange information on human resources development matters
- Address subregional human resource development requirements (Greater Mekong Subregion Inception Meeting of the Working Group on Human Resources Development 1996).

The WGHRD for the Greater Mekong Region, which includes Cambodia, the People's Republic of China (PRC), the Lao PDR, Myanmar, Thailand and Viet Nam, was established in 1995 'to address issues in education and skills development, labour and migration, health, and social development' (Asian Development Bank 2009b). The WGHRD has agreed to develop a strategic framework and action

plan to increase the effectiveness of subregional cooperation in HRD and to strengthen synergies with other subregional initiatives.

At the Joint Summit Declaration of the Third GMS Summit (2008), the heads of governments 'endorsed and underscored the importance of making early and substantial progress on the implementation of the HRD Strategic Framework and Action Plan' (Asian Development Bank 2009b, p. 1). Since its inception meeting in December 1996, the Working Group on HRD has met regularly and has identified numerous HRD issues of common and regional interest and has 'led in many cases to subregional HRD initiatives involving some or all of GMS countries' (Asian Development Bank 2009b, p. 2). The key common human resources development challenges identified by the group include 'to reform, strengthen, and harmonize GMS vocational and technical training standards, and to harmonize labour migration policies to meet labour demand across the region and provide skilled and unskilled workers with cross-border employment opportunities'. The Human Resources Development action plans and strategies include 'to promote regional cooperation in education and skills development', including 'harmonization of competency standards, skills standards testing, accreditation systems including in the higher education sector, and training standards for technical and vocational teachers in occupations required by migrating workers'; 'to finance GMS HRD priority'; and 'to monitor the process of implementing the action plan' (Asian Development Bank 2009b).

Key issues, challenges and prospects concerning skills development for employability and sustainable livelihoods in Asia and the Pacific region include regional and global networking in order to:

- Share innovative and best practices in skills development for employability
- Improving productivity and teaching and learning for skills development for employability
- Training and educating the trainers and teachers working in the area of skills development for employability, including career long professional development

Other issues include:

- The importance of skills in improving education systems throughout the world
- Aligning economic and industrial policies with education and skills for employment and competitiveness, with the lessons learned from successful countries in Asia
- Applicability of the apprentice model and its application in Asia and in societies where high-tech and value-added industries are developing
- How to improve the status of TVET

Strategic networking for action could include the national, subregional and regional levels and could focus on the economic, social and environmental functions of TVET. It also needs to accommodate effective public–private partnerships and strategic skills development reforms. Martinez-Fernandez and Powell (2009) identified three approaches applied by international cooperation

agencies in skills development in South Asia: poverty reduction, economic and social development and governance.

Future actions on the regional and subregional levels should take into account existing cooperation in Asia and the Pacific. The results of this cooperation should be analysed, and the lessons learnt should inform the development of the framework.

ASEAN, CAREC (Central Asia Regional Economic Cooperation) and the Greater Mekong Subregion Program have been identified as the most successful of the non-EU regional institutions worldwide (ADB 2011b). These structures could be used to set up and strengthen the skills development for employability component of cooperation.

Moving Ahead and Work in Progress

This chapter has discussed current issues, challenges and prospects regarding policy making, practice and development concerning skills development for employability internationally but with particular reference to Asia and the Pacific. The analysis presented in this chapter demonstrates the importance of regional economic cooperation for future development. Examples of successful countries' developments in the region highlight the importance of government leadership in aligning skills development strategies with a country's socioeconomic goals. It is suggested that these two trends could provide the main directions for TVET strategy in the region, with regard to (i) support of governments in developing coherent TVET strategies aligned with socioeconomic goals and (ii) development of a regional strategy and tools to support regional and subregional TVET cooperation in Asia and the Pacific. Three broad goals are suggested for national TVET development. The first two are directly related to the economic, social and environmental roles of TVET, while the third is aimed at the improvement of governance for the effective formulation and realisation of required measures.

Key issues and challenges identified in the region and discussed in this chapter could guide the formulation of specific projects to support TVET development in Asia and the Pacific. External and internal efficiencies of TVET are the major criteria for effectiveness and the evaluation of TVET interventions. Although TVET cannot solve all labour market/economic problems faced in the region, well-structured and well-targeted skills development is worthwhile as it benefits individuals, employers, industry and the economy. Research suggests that human capital is the key driver of economic development. Countries investing most in developing their human capital are the ones enjoying the most rapid and sustained economic growth and the highest quality of life (Deutsche Bank 2008; Banks 2008).

The next steps in TVET development should be framed by the recognition of the specific needs of different groups (e.g. school leavers who have not completed secondary school; students from different backgrounds and with different experiences; workers with different skills levels; working people and casual

employers; disadvantaged people who are not engaged in the labour market, including gender based causes; people with disabilities; youth; people in rural areas; migrants from rural areas to cities and between countries). The needs of different economies and the specific training needs of different groups of employers (of various sizes and industries) should also be recognised.

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Chapter 2
Lifelong Learning: Meaning, Challenges, and Opportunities

Colin Nelson Power and Rupert Maclean

Introduction

The idea of lifelong learning became a central theme in UNESCO's work with the publication of *Learning to Be* (UNESCO 1972). The report argued that lifelong learning needs to be the keystone or organising principle for education policies and that the creation of the learning society should become a key strategy for facilitating learning throughout life for individuals and societies.

Learning: the Treasure Within, the Delors Report (UNESCO 1996), built on these two ideas, enlarging them in the light of the challenges facing individuals and the global community in the twenty-first century. For the Delors Commission, lifelong learning implies the acquisition of knowledge, skills and values throughout life, a continuous process of learning to know, to do, to live together and to be the 'four pillars' of education.

In recent years, UNESCO, OECD and other international organisations have replaced the terms 'lifelong education' and 'recurrent education' with the term 'lifelong learning', and this is now virtually universally accepted as the preferred term. As such, the term shifts the focus from education to learning and from just attending school or college during formal education to *learning how to continue to learn throughout the life cycle*.

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Defining Lifelong Learning

In embracing all forms of learning from 'cradle to grave', lifelong learning (LL) is sometimes referred to as being 'life-long and life-wide'. The definition used by the European Commission (2000) is typical and one of the most widely accepted definitions among researchers and policy makers: lifelong learning is defined as:

> all purposeful learning activity undertaken throughout life with the aim of improving knowledge, skills and competencies within a personal, civic, social and/or employment-related perspective.

Generally, learning is classified into three types: formal, nonformal and informal learning. The notions of formal, nonformal and informal learning demonstrate not only the vertical dimension of learning (learning throughout life) but also its horizontal dimension (life-wide learning). Life-wide learning helps to facilitate learners to acquire and integrate various sets of knowledge and skills in order to apprehend, advance or even invent new knowledge and skills (Ouane 2009).

Lifelong learning has become something of an umbrella term. As a slogan, it has contributed to considerable confusion and debate about its meaning and implications for research, policy and practice. As a principle, lifelong learning has rarely been given the prominence it merits: we need to close the gaps between the rhetoric of lifelong learning and what happens in practice. While the focus in lifelong learning is generally on the individual, one of the characteristics of successful organisations and communities is their capacity to continue to learn. Not only do they encourage research and innovation, but they also make optimal use of the diversity of ways in which their members share knowledge, skills and ideas to improve productivity and to ensure that development is sustainable and equitable. Thus, we can speak of a 'learning society', 'learning cities', 'learning regions', 'learning organisations' and 'cultural development'.

Why Is Lifelong Learning Important?

LL = A Basic Human Right = Full Development = Empowerment

The Hamburg Declaration (UNESCO 1997) argues the case for a new vision of education and training in which learning becomes truly life-long on the grounds that it benefits individuals and the society. Lifelong learning is important because it helps to develop the autonomy and sense of responsibility of people and communities; to reinforce the capacity to deal with the transformations taking place in the economy, in culture and in society; and to promote coexistence, tolerance and the informed and creative participation of citizens in their

communities: in short to enable people and communities to take control of their destiny and society to face the challenges ahead.

Acceptance of the principle of lifelong learning by governments, corporations and communities means that individuals can expect to be supported in their efforts to acquire and update the latest knowledge and skills that are essential to their daily and work lives, whenever and wherever they need them. This not only facilitates the personal development of learners but also enhances their employability, social mobility and capacity to be effective in participating in activities designed to improve the quality of life in the community. In Hong Kong, China for instance, the government is committed to the development of a lifelong learning ladder. In this regard, 'a key development was the establishment in 2004 of the Qualifications Framework to provide learners with a clear articulation ladder to foster a vibrant, flexible and responsive environment that would promote lifelong learning' (UGC 2010).

LL = Better Employment Prospects + Higher Income

For the most part, the research (as set out below) has focused on the rates of return (RoR) to individuals and society from formal education and training, as reflected in higher qualifications. Because lifelong learning covers all education, both formal and nonformal, and also covers training, it can be argued that we need to undertake research on how different levels and types of learning contribute to poverty alleviation and sustainable development (Maclean and Wilson 2009).

In the knowledge economy, there can be no doubt that for the individual, continuing to learn, whether by formal or nonformal means, is the key to gaining employment and income stability. The longer one has engaged in formal education and training as reflected in one's skills and qualifications, the higher one's income and the more likely one is to be employed. It turns out the main reason that well-educated and trained individuals earn higher incomes is that they have higher knowledge and skill levels, that is, higher qualifications are simply a proxy for more skills (Maclean and Wilson 2009).

The lifelong learning perspective goes beyond formal education and training to include 'skills development'. The latter is used to describe the wide variety of ways in individuals who are seeking work or who are in employed continue to learn and to acquire the skills and competencies influencing employment and earnings. Adams (2010) points out that measuring and tracking the skills acquired at later stages of the lifecycle are difficult, given the variance in the competencies sought by employers, the diversity of ways in which skills and competencies are acquired and the variations in duration, level and quality of the training being given. Certainly reliable and comparable statistics on within-industry training are difficult to find.

Addressing the learning needs of all young people and adults is a key EFA goal, one that must be met if the MDG goal of eradicating poverty is to be achievable. It concerns literacy, numeracy and the generic (e.g. problem-solving, team work, life

skills) and more context-specific skills (e.g. livelihood, health, marketing) and vocational skills that are usually acquired in more formal settings.

In developing countries, field studies suggest that effective programmes respond to the expressed needs of the poor and are closely linked to income-generating activities and provide training in entrepreneurship and practical knowledge of science and technology (UNESCO 1997; Mahbub ul Huq 1997; Sachs 2005). In developed countries, education and skill levels are strongly related to a person's employability and productivity. Persons who have higher language and quantitative skills are not only more likely to find work, to earn more and to be more productive, and they are less vulnerable to long-term unemployment (OECD 2005).

The evidence suggests in many countries, governments and formal education institutions give little attention to the unmet learning needs of disadvantaged and vulnerable young people who are not in school – their needs are generally left to NGOs (Mahbub ul Huq 1997; UNESCO 2010). Many initiatives exist to reach youth and adults who are poor through nonformal vocational skills training, but they are often locally based, short-lived, underfunded and not part of a comprehensive national strategy for the alleviation of poverty and for sustainable development. Reviews of skills development suggest that countries can begin to design national skills development strategies only if there is adequate information on the learning needs in disadvantaged communities, programme providers, course content, duration and cost-effectiveness (IIZ-DVV 2004; UNESCO 2010).

LL = Social Benefits (Productivity, GDP, Social Capital, Health)

While there is a fairly sizable body of research on the benefits of education for the individual, much remains to be done to clarify the benefits to society stemming from investing in various forms of learning and education throughout the life span. The research certainly suggests that human capital is the key driver of economic development: countries investing most in developing their human capital are those enjoying the most rapid and sustained economic growth and the highest quality of life (Deutsch Bank 2008).

The social benefits of education and training are usually measured in terms of 'social internal rates of return', that is, as the sum of the private and public benefits. Given the limitations of the national data and international indicators being used, estimates are available only for a handful of countries. The estimated long-term effect on economic output of one additional year of education or training in OECD countries generally falls between 3 and 6% (OECD 2005). Learning throughout life leads to improved human capital and labour productivity, and this in turn is the major contributor to economic development (Banks 2008).

To be successful in the global knowledge economy, public and private organisations and industries need information-age workers. Knowledge is growing at an exponential rate: employers need managers and employees who are creative problem-solvers, innovators who are constantly updating their knowledge and

expertise, reflecting on what can be done to improve productivity, seeking to be at the cutting edge of knowledge in their field, and are good team players. Successful organisations take the notion of lifelong learning for their employees and the organisation seriously (Ordonez and Maclean 2006).

As a general rule, the payoffs from investment in basic skills training for the masses are highest in low-income agricultural economies and those still in the early stages of industrial development (UNESCO 1997). It also seems that investing on lifelong learning for all raises the productivity of the whole workforce and also contributes to a lowering of fertility and infant mortality rates and to increases in social capital (UNESCO 1997; OECD 2005).

The existing RoR research is of limited salience to our principal concern: lifelong learning. From a life span perspective, there needs to be shift from the focus on formal levels, GDP and incomes to learning across the life span, poverty alleviation and sustainable development. As Sachs (2005) and others have shown, the obsession with economic growth and rates of return does not necessarily translate into poverty alleviation and sustainable development: in reality, growth often means that the rich get richer and the poor get poorer and even greater exploitation of natural resources.

LL and Poverty Alleviation

The wider social benefits of education in terms of poverty alleviation have been set out in the literature since the early 1980s. For developing countries, the case is almost always made in terms of formal education and specifically primary education, and there is ample evidence that provided primary schooling is inclusive, a good quality and focus in teaching is on learning, and completion of primary education contributes to productivity and thus to the alleviation of poverty (Power 2007; UNESCO 2010). For girls, basic education (particularly if it extends to the secondary level) translates into lower birth rates and lower mortality (Klasen 2002; Jha 2009; Sachs 2005; Power 2007).

What evidence there is on female literacy suggests that continuing to develop skills and learning about the *Facts for Life* (UNICEF et al. 1992) also pays off in terms of improved health, nutrition and family stability. Literate, educated women have fewer and healthier children and better health themselves than those with little or no education. Moreover, the higher the education and skill level of the mother, the more likely it is that her children will stay on to complete their formal education and perform well (Power 2007; UNESCO 2010).

Many education and development policies are based on the assumption that literacy and primary education play a key role in poverty reduction, while higher education is crucial for economic development in the global knowledge society. While both are true, the evidence is also mounting that all levels of education and types of training (formal and nonformal) can contribute to both, that is, learning throughout life is the ‘master key’ to sustainable development and poverty

alleviation. For example, recent analyses of Indian and cross-national data indicate that higher education not only contributes to economic development in India but also makes a significant contribution to the reduction in absolute as well as relative poverty (Tilak 2007). When higher education institutions use their expertise to work with poor communities and act as their advocates, progress can be made in combating poverty, raising the basic skill levels of both children and adults and improving crop yields, health and nutrition (Arini et al. 2007; Power 2007).

The key issue, however, is whether it is that exposure to initial formal education that makes a difference or whether it is continuing to develop skills and learning about the *Facts for Life* which 'pays off'. One suspects that both are important.

LL as the 'Master Key' for MDGs

For most international organisations, the policy of providing additional learning opportunities throughout life is viewed as 'the master key' that opens the doors to poverty alleviation, greater social justice, equity, peace building and sustainable development (Ordonez and Maclean 2006). Nations with low levels of investment in education and training tend to have low levels of school life expectancy and wide skills gaps. They are very much in danger of falling even further behind in terms of human and economic development and are the countries least likely to meet their Millennium Development Goals (UNDP 2009). On the other hand, the Asian developing countries that have invested heavily in meeting the learning needs of both children and adults have made, for the most part, remarkable social progress in achieving their key MDG targets (UNDP 2009; Power 2007, 2009).

Moreover, all children and adults will constantly need to update their understanding of how the environment is changing and its implications for how we will need to act in the future as the planet warms, and new scientific evidence on the impact of human activity comes to light. The MDGs relating to climate change and carbon emission will not be achieved in the absence of effective ESD formal school, higher and TVET programmes **and nonformal programmes** that reach out-of-school youth and adults, young and old and rich and poor.

From the perspective of lifelong learning, it is the **additionality**, the learning outside the formal system and the learning over and above initial formal education and training, that counts in a world of constant change and increasing complexity. When it comes to poverty alleviation and education for sustainable development, what evidence there is suggests that **both a sound formal education and this additionality are needed.**

Issues in Addressing Poverty Alleviation and Sustainable Development

Poverty

What it means to be poor and the measures that need to be taken to address poverty issues depend very much on the context. The more effective PRSs are sensitive to the facets of poverty that are dominant in a given context; they engage the poor being targeted at all stages of the development and implementation of the programme; they adopt a multi-sectoral approach; and they generate new strategies for leveraging resources (Power 2007, 2011).

Poor families are concentrated in nations and communities caught in what Sachs (2005) calls the 'poverty trap'. The key problem is that when poverty is extreme, the poor do not have the ability by themselves to get out of the trap. In particular, girls and women in most poor parts of the world are locked into a cycle of poverty and early marriages, with illiterate mothers bring up illiterate daughters who are married off early into yet another cycle of poverty, illiteracy, high fertility and early mortality. Breaking this cycle requires more than educational interventions: it demands a comprehensive development programme that transforms the basic conditions of rural and slum community life. Learning throughout life, and especially literacy, needs to be part of this transformation (UNESCO-UIE 2010), but providing other basic infrastructure elements (water wells, fuel supply, health clinics, roads, etc.) is also necessary, not to speak of micro-credit, improved employment and income-earning opportunities (Power 2007).

Sustainable Development

The major issue facing the world today is that of learning how to live and work in ways that are sustainable, so that the reasonable needs of people from all walks of life and in all countries can be satisfied, without so overexploiting the natural resources upon which all life depends that the ability of future generations to meet their needs is threatened (UNESCO-UNEVOC 2004).

The threats stemming from global warming and climate change have been brought into sharp focus by the 1992 UN Conference on Environment and Development, the Kyoto Protocol, Al Gore's advocacy (*An Inconvenient Truth*), Stern Review, the Intergovernmental Panel on Climate Change and the UN Decade of Education for Sustainable Development (2005–2014). The effects of global warming are showing up with increasing intensity: destruction of forests and species habitats, acidification of oceans, loss of wetlands, bleaching of coral reefs and rapid and continued loss of biodiversity, to name a few. As climate change accelerates, hundreds of millions of people are likely to be deprived from access to

water, and millions more will be displaced as sea levels rise, floods and droughts become more prevalent and crops fail. In some parts of the world, it is predicted that there will be sharp rises in death toll from climate-induced diseases (Commonwealth Foundation 2007). Learning how to live and work in ways that are sustainable includes, but necessarily goes beyond, formal programmes for education for sustainable development (ESD): the principles of sustainable development need to be installed in all levels and to cover all types of education.

The challenge to nations, industry and communities is to take decisive and urgent action of key issues relating to sustainable development. Acting on SD is not a mere question of ESD; it is, rather, an issue of political will. As Sen (2007) and Power (2010) have noted, the major issues to be faced in meeting the MDGs are 'unaffordability' and the lack of 'political will'. To these, Adams (2010) adds the need for reforms in governance, finance, market and school.

Governments are likely to act only if there are strong pressures within and from the international community to do so. One of the key tasks of the re-engineering of education systems being called for is that of empowering all, but especially marginalised, groups, with the knowledge, skills and confidence to join the struggle to create a better world; a global community committed to ensuring development is sustainable, and the rights of all to health, education, justice and security are respected (Campbell et al. 2006). It will be 'people power' that forces governments to introduce the tough measures needed to reduce greenhouse emissions, to eradicate poverty and to provide quality education for all. But to generate that power, all young people and adults (including politicians, the media and corporate leaders) need to understand what it means to be poor, why poverty persists and how global warming will affect them and their families. Moreover, throughout their lives, they will need to learn and how to learn, updating and extending their knowledge and skills so as to better cope with change, generating the capacity and confidence to participate in the struggle to build a better world.

Re-engineering Education and Training

A few tentative steps have been taken by providers of formal education in a few countries to:

1. Ensure that learning as one moves from one level to the next is **seamless**.
2. Improve the **articulation** between levels and types of education and training.
3. Revise their **qualification frameworks, accreditation, quality assurance, indicator and assessment systems, and establish equivalency frameworks** to better recognise TVET, adult and continuing education, within-industry training, apprenticeships and nonformal programmes.
4. Make more **effective use of IT** and open learning systems to reach the unreached and to support on-the-job training.

5. Increase the **funding** and provide other incentives in support of nonformal education and training (i.e. adult and continuing education, NGO and industry-based training) while maintaining (and if necessary also increasing) support for formal education to achieve national and international goals (e.g. EFA, MDGs, ESD).
6. Develop an **integrated policy framework** to drive the reform of the entire formal and nonformal education and training system, its component parts and the pathways between them.

Such steps are important elements in confronting the challenge posed by lifelong learning so that they are consistent with the principles of lifelong learning. In the end, what is needed is to use the principles of lifelong learning as the framework for re-engineering the entire education-training-adult learning system.

Adopting a life span perspective takes us back to the issue of the **learning needs** to be met at each **stage of human development** and the changing priorities of the individual and the communities (local, national and global) in which they live and in particular those that assume importance in addressing issues of poverty and sustainable development.

Lifelong Learning: A Developmental Perspective

From a lifelong learning perspective, providing a good beginning for development during the *early years of life* is of crucial importance. The emerging research field known as 'foetal origins' suggests that the 9 months of gestation may constitute one of the most consequential stages in human development. The expansion of *early childhood care and development* activities, including family and community interventions, especially for poor, disadvantaged and disabled children, has been an integral part of the EFA agenda for the past 20 years. The evidence confirms the important contribution that quality ECCD makes to cognitive and social development for children from all backgrounds, but particularly for the poor and the least advantaged (UNESCO 2010).

The developmental tasks for children of *primary school* age seem at first glance to be fairly straightforward, at least so far as formal education and nonformal learning programmes for out-of-school children are concerned. Obviously, one needs to get the foundations for subsequent learning and development right. In practice, this boils down in primary schools to a focus on basic learning needs, bearing in mind that the learning needs and life circumstances of children do vary and that some children will need much more support and help than others. A key challenge facing primary schools is to determine what is important now, what can be left to other stages in the learning cycle and how best to involve parents and the local community and to make effective use of their resources to supporting learning.

With the onset of *puberty*, the scope and nature of the developmental tasks facing the young people assume a somewhat different character. *Secondary*

education, the 'crossroads of life' should be 'the time when the most varied talents are revealed and flourish' (UNESCO 1996). Meeting the basic learning needs of adolescents is of particular importance in facilitating the transition from childhood to adult life. As secondary education for all becomes a reality, it becomes increasingly difficult to meet the learning needs of all young people attending high school. Preparing young people for higher education can no longer be the primary purpose of secondary schooling, and thus the emphasis shifts to preparation for adult life and particularly for the world of work: hence, the increasing 'vocationalisation' of secondary education (Lauglo and Maclean 2005).

Reorienting TVET for sustainable development and poverty alleviation has been a significant part of the agenda of the UNESCO. The central theme of the Second International Conference on Technical and Vocational Education was *Lifelong Learning and Training: A Bridge to the Future*. Developing this theme, it has been working hard at the task of moving TVET from the narrow task of providing training for industry and occupation-specific skills to the broader task of workforce development and lifelong learning for sustainable development. The Bonn Declaration (UNESCO-UNEVOC 2004) affirmed that skills development leading to age-appropriate TVET should be integral to education at all levels. In seeking to reach the unreached, more support needs to be given to the work being done by TVET colleges to develop open systems of learning using the new technologies as well as more traditional modes of distance education (Maclean 2005; Ordonez and Maclean 2006; Fien et al. 2009; Maclean and Fien 2010).

Similarly, UNESCO World Conferences on Higher Education in 1998 and 2009 called for the *reorientation of higher education* in the light of the challenges facing us in the twenty-first century and at the same time a reaffirmation of its commitment to the core values and functions of higher education, in particular insisting that its mission must be to 'contribute to sustainable development and improvement of society as a whole should be preserved, reinforced and further expanded' (UNESCO 1998). Through their research and teaching, they can help policy makers and those working at the coal face to better understand what needs to be done to alleviate poverty and to promote sustainable development. It is in our higher education institutions that the educators of the future are trained and those already in the workforce need to have their knowledge and skills base constantly upgraded (Karmel and Maclean 2007). Moreover, they play (or should play) a significant role in the dialogue and action needed to move from the existing fragmented and at times dysfunctional formal system of education to one that takes the principles of lifelong learning seriously and re-engineers education and training in ways that contribute to the alleviation of poverty and sustainable development.

The contribution of *nonformal learning* and the re-engineering of *adult and continuing education* is unquestionably one of the greatest challenges in the quest to ensure all have the opportunity to learn throughout life and to ensure that development is sustainable (Maclean and Singh 2005). In the knowledge society, the increasing involvement of employers and community groups in recurrent and adult learning programmes is opening up new pathways and opportunities, but recognition of that learning by formal education institutions is rarely given (Karmel

and Maclean 2007). Sadly, the dedication and enormous contribution being made by voluntary organisations and nongovernment organisations tend to be ignored by education authorities and, at best, given token support by governments – the investment in adult learning in most countries is less than 1% of GNP (UNESCO-UIE 2010). From a lifelong learning perspective, nonformal, adult and continuing education must feature as a significant part of an integrated system and be given the recognition and support they need in the struggle to alleviate poverty and to ensure that development is sustainable.

In many countries, *informal learning* via the media and the net has assumed an ever more significant role in shaping the knowledge base and values of the masses, at times playing a constructive and enriching role but too often falling short of its potential to facilitate learning throughout life and even at times contributing to the destruction of small cultures and the creation of a culture of consumerism, violence and prejudice. How to enlist the media and how to help all, young and old, to use the net wisely and as part of lifelong education have become a major challenge.

Desirable Future Directions

To achieve the goals of lifelong learning for poverty alleviation and sustainable development, it is suggested that *the governments of the Member States of the UN*:

1. Establish a lifelong learning Task Force or Commission responsible for making recommendations to government on policies, strategies and changes that need to be made in order to promote a culture of lifelong learning, to set national targets and to develop and implement integrated action plans and strategies for poverty reduction and sustainable development.
2. On the basis of the recommendations made by the Task Force, develop a coherent policy and set of strategies for awareness raising and to support the re-engineering of existing systems of formal and nonformal education and involve stakeholders and the media in promoting of lifelong learning for poverty alleviation and education for sustainable development.
3. Request all authorities within the public and private sectors of the education and training to undertake a review of the extent to which existing policies and practices are consistent with the principles of lifelong learning, to submit their findings to the Task Force and to work with it to identify priories for action.
4. Provide much greater support for nongovernment and voluntary organisations active in providing nonformal education and training to enable them to better assess and report on view the contribution that their organisation is making to the creation of opportunities to continue to learn throughout life for all and particularly those whose needs have not or not being adequately met by the formal system.
5. Request employer and community groups and other stakeholder groups to identify skills gaps in the labour market and unmet learning needs of

disadvantaged groups in the communities in which they work, giving special attention to the poor and to education for sustainable development for all.
6. Provide the Task Force with the funds and authority to commission reviews of the research and to undertake additional studies to assess the effectiveness of education and training programmes for children, youth and adults for poverty alleviation and sustainable development and to examine issues of articulation within and between sectors, recognition of nonformal education and training and reorientation of accreditation, qualifications frameworks and quality assurance mechanisms in accordance with the principles of lifelong learning.
7. Support professional development and training programmes for key educational and training personnel to facilitate their efforts to develop strategies within the framework of lifelong learning for poverty reduction and sustainable development.

Request international organisations (intergovernmental, nongovernment, development banks and agencies) to:

1. Collaborate in the development of a coherent, integrated UN policy and action plan to provide all with opportunities for learning throughout life for poverty reduction and education for sustainable development, reinforcing and extending their collective and individual efforts to support programmes and activities aimed at achieving the MDGs by 2015.
2. Generate a shared international agenda, agreed targets and strategic plan of action and joint agreements on roles, responsibilities and funding.
3. Expand international statistics and develop more robust and policy-relevant indicator systems to assess progress in promoting lifelong learning, the effectiveness of international and national policies and strategies aimed at poverty reduction and sustainable development policies and strategies and the social, economic and environmental benefits from investments made.
4. Build partnerships with and seek the support of international corporations, media, foundations and nongovernment organisations involving them actively at all stages in the development and implementation of lifelong learning policy and strategies.
5. Support international, comparative and developmental research on the effectiveness of LL policy and programmes for poverty alleviation and sustainable development.

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Chapter 3
Vocationalisation of Secondary and Tertiary Education: Challenges and Possible Future Directions

Margarita Pavlova and Rupert Maclean

Introduction

This chapter examines the change of vocationalisation over time from 'educational' to 'functional'. It analyses social and economic debates and the ways economic competitiveness is viewed in relation to human resource development and some implications for vocationalisation. The chapter argues that change from education-driven to a functional model of skills development within secondary schooling can be observed in the Asia-Pacific region. A number of trends associated with this change are analysed. The chapter also includes two examples of vocationalisation policies in the region to illustrate these trends. It is argued that the development of employability skills within the context of specific occupations and the inclusion of general education in TVET programmes can be viewed as being amongst the main directions for the vocationalisation of secondary schooling. The diversification of postsecondary TVET and its close links with industry is another example of the employability emphasis in training that is examined in this chapter. Vocationalisation of higher education is analysed through the different levels of debate as to whether tertiary education is becoming too focused on preparing individual for employment. Some examples of bridging academic and vocational learning are used to illustrate implementation practices.

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Changing Rationale Behind the Process of Vocationalisation

Social Role of Vocationalisation

The introduction of vocational content and courses into the school curriculum has its own supporters and critics. One argues that the introduction of vocational programmes in schools has the potential to create a more inclusive environment for disadvantaged students (e.g. Kelly and Price 2009) by providing career-focused, experiential learning. In Indonesia, upper-secondary vocational schools cater more to the poor than to general secondary schools, drawing 21% of their students from the lowest income quintile, compared to only 13% for general secondary schools (ADB 2007a: 30). Studies in OECD countries also provide evidence of this trend. They report that a 10% increase in the share of upper-secondary students in vocational and pre-vocational programmes is associated with a 2.6% increase in the secondary school graduation rate and a 1.9% increase in the proportion of 15–19-year-olds in school (Bishop and Ferran 2005). This data demonstrates the social role of TVET that is closely related to the 'original' process of vocationalisation that began in the 1970s with the aim to *promote the social inclusion of less privileged groups in education and training*, to *narrow educational gaps* and to *avoid social fragmentation* (Lauglo 2005; Lauglo and Maclean 2005). Vocational skills were viewed as a coherent part of the overall education system. The massification and diversification of secondary education and the expansion of access to vocational and technical education have helped to retain more students in school. This social function of vocationalisation led some youths to stay in school longer than they might have if they only had the choice of an academic curriculum.

However, others who criticise vocationalisation believe that it leads to the stratification of society and the replication of socio-economic structures. Young (2010a) argues that a vocational approach to curriculum design leads to the situation when learners remain fixed in their life experiences and are unable to move to a different social status. This partly relates to the attitudes towards TVET in many societies: 'the vocational is at the bottom of a hierarchy of knowledge and value, it is a stream of learning available to the 'lower achiever" (Stevenson 2005: 335–336). This negative stigma attached to VET creates a 'vocational habitus' (Taylor 2008) where students stay and which in turn develops their aspirations. As a 2002 Australian Council of Education study (referred to in Dalley-Trim et al. 2008) highlights, profiles of Australian students in vocational education programmes include low achievers, residing in rural areas, attending government schools, from an English-speaking background and having parents who do not have tertiary education. VET content in schools leads to reproducing social structures as students are not challenged to go beyond their experiences (Lehmann 2005).

These arguments about the social role of TVET have been overshadowed by the economic arguments that relate TVET (and education) to the economic paradigm where the concept of economic competitiveness became the main reference point for many educational reforms.

Economic Competitiveness

Over the last two decades, globalisation has come to the fore, and the focus of countries has shifted from social to economic issues. Nations have been transformed into competition states, and now competitiveness is at the top of the political agenda internationally. Institutions like the World Economic Forum (WEF) define national economic competitiveness[1] and measure it to provide comparative statistics for 'evidence-based' policy. The WEF classifies countries according to the stage of development: factor-driven economies (stage 1), efficiency-driven economies (stage 2) and innovation-driven economies (stage 3) with a transition phase between each stage.

The composition of the Global Competitiveness Index produced by the WEF includes human capital components. In the 2007–2008 Global Competitiveness Index, 18 indicators or 15.9% of all indicators (Sabadie and Johansen 2010) were related to human capital[2] which focuses on individuals' capacities to be developed through education and training. Education related factors have different a weighting at various stages of development. Human capital accounts for more than 24% of the national economic competitiveness score for countries in the innovation-driven stage, and for 16.3% at the factor-driven stage in the WEF Global Competitiveness Index 2007–2008 (Sabadie and Johansen 2010: 244). This data as well as other studies (e.g. Mankiw et al. 1992; Barro 2000; Krueger and Lindahl 2001) shows that human capital leads to economic growth. In addition, Sabadie and Johansen's (2010) modelling demonstrates that 'in all selected countries, increases in the GCI score through human capital are much higher than what can be gained through improvements in macroeconomic stability' (pp.249). Therefore, an improvement of education and training systems is even more important to the enhancement of economic development than is 'macroeconomic stabilisation, although the latter is routinely considered a key factor of development' (pp.249).

Internationally, the human resource development (HRD) concept has attracted more and more attention compared to human capital, although the meaning of these two concepts is quite close. In its broad definition, HRD includes health and standard of living, together with education and vocational training; in its narrower definition, the focus is on upgrading skills in order to maximise the effectiveness of economic activities. Therefore, although human capital constitutes only the economic dimension of HRD, 'in recent years the narrower definition of HRD has 'tended to prevail" (Kelly 2001), and both concepts have been used interchangeably.

An expansion of the narrower agenda of HRD has influenced the reorientation of secondary and higher education towards individuals' employability (Kelly 2001)

[1] Economic competitiveness – 'the set of institutions, policies and factors that determine the level of productivity of a country' (Sala-I-Martin et al. 2009: 4).

[2] Definition of human capital: 'the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic wellbeing' (OECD 2001: 18).

	Lower secondary		Upper secondary		Post - secondary non-tertiary		Total number of countries
	1999	2009	1999	2009	1999	2009	
South and West Asia	0	0	4	3	4	5	9
Central Asia	0	0	7	7	4	4	9
East Asia and the Pacific	5	3	13	11	10	7	33
Total	5	3	24	22	18	16	

Fig. 3.1 Number of countries in which vocational programmes are available (Source: UNESCO Institute for Statistics database 2010)

and productivity to achieve development goals through income generation. In this new debate, vocationalisation is viewed to be an instrument for HRD that can be effective in increasing economic competitiveness and reducing poverty through improving productivity and employability. Vocational skills are considered as an effective way to develop human capital that emphasises the economic purposes of education and training.

Therefore, in terms of vocationalisation, the move is from *education-driven to a functional model of skills development within secondary schooling*: that is, from vocationalisation as an inclusion of TVET content into schooling to a more broad interpretation that takes in the vocational stream at school. Karmel (2007) stated that over the last decade, the Australian VET system has become industry led 'rather than educationally driven' (pp.104).

Vocationalisation Agenda in the Region

The vocationalisation of secondary schooling is present in the Asia-Pacific region. Out of 41 countries included in UNESCO statistics, 22 provide vocational programmes at the upper-secondary level and 16 at the postsecondary, non-tertiary (see Fig. 3.1) that prepare students for direct entry into a specific occupation. These statistics do not include the vocational content of schooling delivered through the academic part of curriculum. The variations across different regions within Asia-Pacific and amongst countries in the regions are significant. For example, in India, only 1.8% are enrolled in the upper-secondary TVET, and in Indonesia, it is 38%, whilst in the People's Republic of China (PRC), 50.7% are enrolled in pre-vocational studies (OECD 2010).

In accord with the HRD argument, many governments establish high targets for the proportion of secondary students they want to enrol in vocational studies. For example, targets for secondary vocational programme enrolments, set up by the governments of Indonesia and the PRC, were 70 and 60%, respectively (Copenhagen Development Consult A/S 2005: 7). India targeted 25% (World

Bank 2006a: ii) and Bangladesh 20% of all secondary students to be enrolled in the vocational/technical secondary stream (World Bank 2007: 12). Pakistan planned to add technical/vocational streams in secondary education and aimed for half of all secondary students to enter those streams (World Bank 2006b). These targets could provide implementation challenges for these governments. As a reflection on Australia's expansion of VET system over the past 20 years revealed, an increase in funding by government's played a key role in this process (Snell and Hart 2007). Currently, 61.2% of upper-secondary students pursue pre-vocational or vocational programmes in Australia (OECD 2010: 300).

A number of trends related to vocationalisation which may be observed in the region will now be discussed.

Trends in the Vocationalisation of Secondary Education

Expanding the Basis for Vocationalisation

As argued above, the demand to enhance productivity and the employability of individuals through the development of work-related competences brings the vocational strand at the secondary school level under the umbrella of 'vocationalisation', together with general and 'pre-vocational' options. Functional aspects of this training that are relevant to labour market needs (e.g. technological knowledge, flexibility, better productivity) become increasingly more important than are educational achievements. Employers across different countries when surveyed (e.g.Turner 2002; Australian Industry Group and Deloitte 2009; Jiang 2008) consider employability skills to be the most important factor for employing graduates. Although a list of employability skills varies across countries,[3] they are nevertheless related to the general skills valued by employers and the ones that help individuals gain employment and progress successfully through a working career. This functional approach to skills development provides some directions for TVET programmes developed at the upper-secondary level that should mainly be focused on general/employability skills, within the context of specific occupations. These skills, variously referred to as core, employability, generic, key or life skills/competencies, are playing a significant role in ensuring that young people have the necessary qualities to enter and participate in the workforce. In 2008, an Asia-Europe Meeting (ASEM) research network on core competencies (2008) was established to identify core competencies and to explore the ways in which these competencies operate in diverse contexts.

[3] Australian framework identifies eight main employability skills: communication, teamwork, problem solving, initiative and enterprise, planning and organising, self-management, learning and technology (Australian Chamber of Commerce and Industry and the Business Council of Australia 2002). Key competency groups, the NZ: thinking, using creative, critical and metacognitive processes; using language, symbols and texts; managing self; relating to others; and participating and contributing appropriately as a group member (Ministry of Education 2007).

In 2006, the Singapore Workforce Development Agency identified ten foundational skills that are applicable across all industries.[4] Since then, courses are offered in these areas, particularly for those who do not have any formal qualifications, in order to provide an alternative entrance requirement for National Innovation and Technology Certificate (NITEC) courses. Since 2001, qualifications in the Philippines have been based on three types of competencies: basic (generic work skills), common (industry specific) and core (occupation specific). Some examples of basic competencies are leading workplace communication, leading small teams, developing and practising negotiation skills and solving problems related to work activities. In the Philippines, life skills were integrated into SIYB competency standards. A recent study by Bowskill (2012) suggests that after several years following graduation, school graduates in New Zealand valued more the development of employability skills through their TVET courses rather than subject-specific and specialised skills.

Merging TVET and General Education

The call for the development of employability skills underpins another trend, that of an increasing convergence between academic and vocational education at the upper-secondary level (Pavlova 2005). More emphasis on the general component of education, particularly in developed countries, has contributed to more effective performance within the high-productivity sectors. In the Republic of Korea, about 40% of secondary students are currently enrolled in TVET, and in some schools, academic and vocational students share almost 75% of the curriculum. By doing this, the government is opening up new pathways for TVET students onto higher education (UNESCO 2005) as well as responding to the industry needs. A recent Australian Industry Skills Council's (ISC) report (2011) identifies language, literacy and numeracy (LLN) as the essential skills that underpin people's ability to be effective in employment, continue life learning and participate fully in the life of their society. This report describes LLN as being contextual and often closely linked with specific vocational skills, so that for effective learning to occur, general competencies need to be taught within the context of specific competencies.

This trend is observed in countries located at the innovation-driven stage of economic development and could be applicable for all countries on a proportional basis that aims at the development of some sectors with a high-skill demand.

[4] Workplace literacy and numeracy, information and communication technologies, problem solving and decision-making, initiative and enterprise, communications and relationship management, lifelong learning, global mindset, self-management, work-related life skills, health and workplace safety.

Quality and Delivery of Vocationalisation

Another issue that relates to the question of what type of training should be provided at the upper-secondary level within the vocationalisation agenda is the quality of teaching and its delivery. In Australia, for example, the learning of students is guided by training packages built around competencies specified by industries. However, Polesel (2008) concludes that the bulk of vocational programmes offered in Australia at the upper-secondary level are of poor quality and do not provide students with either specific or generic competencies. Most students do not go straight into the labour market, but if they do, they work mainly in casual, part-time and low-paid jobs in the retail sector. Many studies highlight the need to find a balance between on-the-job training and off-the-job training, where students develop knowledge that underpins their practice and where they acquire transferable skills (Snell and Hart 2007). The similar concern of excessive on-the-job training is observed in the UK (Winch and Clarke 2003). It is important to broaden the learning experiences of students through their engagement into a coherent programme that helps to develop knowledge, skills and their application (ibid). So there is a need to include a component of general education and which focuses on the development of general/employability skills in TVET training, as well as linking theory and practice to develop a holistic understanding of practices by the students.

The Move from Specific Job-Skills Training ('A Career for Life' Reality) to Flexible Training ('No Lifetime Job Security' Reality)

The slow change of available technologies in the 1960s and 1970s favoured specialised skills development and more or less guaranteed a career for life. The more rapid pace of technological change, particularly in developed countries, has contributed to the increasing importance of general education that helps workers to perform within the high-productivity sectors. Therefore, a move from specific job-skills training ('a career for life' reality, immediate and long-term relevance to occupational requirements) to flexible training ('no life time job security' reality, rapidly re-deployable labour force requirement) has been observed. In this context, the vocationalisation of general education has become more and more important for these economies, and the role of general human capital is increasing. The distinction between general and specific training/knowledge closely relates to technologies and could be described in terms of general and specific human capital (GHC; SHC). This distinction is made on the basis of whether the individuals can operate only one specific technology (SHC) or whether their GHC helps them to operate any technology (Kim and Terada-Hagiwara 2010). Depending on the stage of development, countries should properly balance the development of general and specific human capital to ensure the adaptation and diffusion of new technologies.

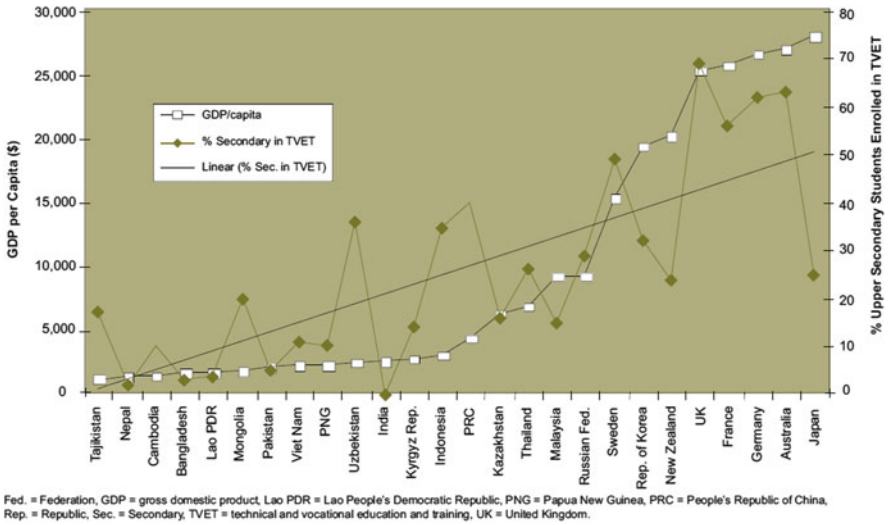

Fig. 3.2 Percentage of upper-secondary students enrolled in TVET programmes in selected countries, 2002 (Note: this is the most recent year for which this comprehensive information is available) (Source: ADB 2009b (calculated from enrolment data in International Centre for Technical and Vocational Education and Training, UIS-UNEVOC 2006))

Observable Relationship Between TVET Enrolment and GDP

The emphasis on employability skills aligns education to the 'real world' (the world of economy). Vocationalisation has been viewed as an instrument in increasing economic competitiveness through improving productivity and employability as has been argued above, with countries at all levels of economic development benefitting from the development of human capital. Figure 3.2 presents data on relationships between upper-secondary TVET enrolments and GDP.

Countries at any economic stage will benefit from an improvement of human capital. As modelled by Sabadie and Johansen (2010), the country positioned last in the Global Competitiveness Index, by improving its human capital score, would improve its competitiveness ranking close to 25% and move from its last in the world position to 109, similar to the current rank of Albania. However, the benefit of education and training becomes greater with the higher rate of technological change, since the higher level of human capital relates to the higher level of technology it can adopt.

This correlation between the GDP and secondary TVET encourages governments in the region to consider the process of vocationalisation seriously, although the costs involved in establishing TVET at the secondary school level are high.

Costs Involved in Establishing TVET

A large body of empirical literature has developed over the past 25 years which argues strongly, on cost-benefit grounds, against vocational schooling at the secondary level.

TVET is generally more expensive than general education due to factors such as smaller classes, the cost of equipment and supplies. In the PRC, for example, specialised secondary schools and vocational schools cost $660 and $350 per student, respectively, compared with $240 per student in regular secondary schools (Copenhagen Development Consult A/S 2005: 41). In Indonesia, vocational secondary schools cost 25% more per student than general secondary schools (ADB 2009b). The unit cost of vocational education in India is about 60% higher than that of general secondary education (Government of India 2010)

Despite these higher costs, in some countries, TVET graduates do not receive higher wages than general education graduates. The results of a World Bank tracer study in Bangladesh indicated that overall, only 10% of TVET graduates were employed, whilst in the case of female graduates, this was just 5%. About 45% of graduates were unemployed and 45% were pursuing further education (World Bank 2007: 29). In addition, those with vocational qualifications who were employed received lower wages than did graduates of the general education system (World Bank 2007: 33), suggesting low returns on investment in TVET that is supply-driven. Bangladesh is at the factor-driven stage of economic development.

However, evidence from Tajikistan, which is at the same stage of economic development as Bangladesh, demonstrates that in 2009, more secondary TVET graduates were employed at the level of 'mid-level specialists' than were graduates from general secondary education (45.8 and 17.3%, respectively). A majority of general education graduates were employed as unskilled workers. Therefore, wage difference, relative to vocational or general secondary education, can be observed. It is important to note that traditionally a sizable proportion of the TVET curriculum in Tajikistan includes general studies so the TVET graduates have an additional advantage compared to academic graduates.

Some evidence indicates that returns to investment in vocational education may differ according to the stage of development of a country. An ADB report (ADB 2009b) argues that in low-income countries, primary education is the best investment, whilst the expansion of secondary education yields the highest social returns for middle-income countries, and in high-income countries, the returns may be greatest in tertiary education.

Another ADB report (2009a) suggests that considering costs, and the difficulty of implementation, vocationalisation may be considered advantageous only in several cases in the Asia-Pacific region:

- Training in the use of computers (which is applicable across a variety of occupations and across subjects within general education)
- Low-cost programmes that are not gender specific, such as agriculture, accounting and business studies (which are useful for broad occupational segments)

- Entrepreneurship training to enable school graduates to plan, start and run a business in order to boost self-employment

It is important to note that the nature of secondary TVET (a proportion of general studies) is equally important to consider with regard to increasing returns on the vocationalisation of secondary education. As was suggested above, the development of human capital/HRD contributes significantly to economic growth at each stage of economic development. TVET is an important factor in this process, particularly considering its changing nature at the level of secondary education within 'new' vocationalisation.

A well-regarded study by Psacharopolos and Loxley (1985) evaluated the economic soundness of curricular diversification. They concluded that:

> Based on comparisons of costs and achievement gains in academic and vocational knowledge between INEM [schools with some pre-vocational courses] and control schools [in Colombia], INEM industrial, social service, and agricultural streams are substantially less expensive than their control counterparts. Combined with the fact that these programs substantially boost achievement scores, they are unquestionably successful. And *although the INEM academic and commercial programmes cost more that their control counterparts, they also substantially boost achievement* [italic added]. (pp.93)

Similar results were found for Tanzania. Although diversified schools cost more, there was a substantial increase in both academic and vocational knowledge, over that of the academic control group (ibid, pp.179). Therefore, the investment in diversified schooling did boost learning both in the vocational subjects, explicitly targeted, and also in general academic subjects.

Implementation Initiatives

The vocationalisation of secondary education is currently taking a new form and aims at increasing students' employability through developing their personal employability characteristics, general competencies and specific vocational skills. The emphasis on particular components depends mainly on the level of economic development that predetermines the required skills.

Vocationalisation occurs at both the lower- and upper-secondary levels, through both embedded and distinct deliveries. At the upper-secondary level, most countries have both technical/vocational schools and diversified secondary schools with general academic and vocational courses. This section illustrates current practices and policy plans of two countries in the region.

Malaysia

In Malaysia, the government is considering whether to introduce vocational subjects at the lower-secondary level. The programme is targeting 13–15-year-old students and is proposing a preparatory programme in helping learners to enter

upper-secondary technical schools that train students towards the Malaysian skills certificate. This preparatory programme consists of three blocks (master electives, general/instructional subjects and a character-building program) (Kasih 2010). This approach is consistent with the principle of employability skills development, within a context of specific occupations, and with the argument developed by Pavlova and Huang (2012) on the importance of character building.

In terms of vocationalisation at the upper-secondary level, the Ministry of Education (MOE) has approved twenty-two elective vocational subjects to be included in the curriculum offerings of academic schools.[5] This has been stated as an important measure in the Education Development Master Plan (EDMP) 2006–2010. These twenty-two courses relate to five broad occupations: engineering services, construction, home economics, agriculture and computer applications. The Ministry of Education (MOE) has also set up the *National Key Performance Indicators (NKPI)* that include an increase in the number of TVET students in both academic and technical schools at the upper-secondary level over the next 5 years (2010–2015) with the aim of reaching 100% participation.

Data collected through a tracer study by the Johor State Education Department (JSED) in 2004 presents the destinations of the students who graduated after the completion of vocational subjects. 14.29% (15 people out of 105) of students who took part in that study pursued education in the same area in both public and private institutes of higher education; 8.57% of graduates (9 people) pursued careers in the field of their training. Although 45.7% of students were not engaged in careers relevant to their vocational studies at school, only 16.19% of students were unemployed.[6]

These results raised a number of important questions. Some possible reasons for low continuation of careers in the areas of training could include inadequate career counselling arrangements, provision of only work-related knowledge without well-established links to the general principles that underpin practices, a lack of motivation, poor quality and low relevance of courses and the need for an update of content and the poor quality of teaching.

Another tracer study of secondary technical and vocational graduates in Malaysia by ADB indicated 90% of technical graduates moved on to polytechnics, whilst the remaining 10% (mostly secondary vocational school graduates) proceeded to specialised vocational institutes. A telephone survey in 2006 by the Malaysian Employers Federation indicated satisfaction with graduates' technical knowledge, but employers wished to see a greater emphasis being placed on soft skills, such as problem solving, communication and work ethics (ADB 2007b: 16–17).

[5] Based on paper by Minghat et al. (2010).

[6] Source: The Technical and Vocational Education Unit, Johor State Education Department (2007) cited in Minghat et al. (2010). Note: The sample above was based on three schools that offer the VS; the SMK Pekan Baru, Muar, SMK Perling, Johor Bahru and SMK Bandar Tenggara, Kulai.

The example of Malaysia illustrates a political will to vocationalise secondary education at both lower-secondary and upper-secondary levels to enhance economic growth. To achieve success in this initiative, the quality and relevance of the courses should be improved as well as more emphasis being placed on soft/employability skills development. These vocationalisation policies are underpinned by different rationales which include:

- Social: to keep potential dropout students within school, to provide greater accessibility to skills development and character building, to achieve an increase in attainment
- Economy-related: to develop occupation-specific skills to improve the quality of human resources

However, to move the country's economy to the next level of development, employability skills should be explicitly addressed as well as that of developing higher order thinking skills, and problem solving, to help students adapt to the fast changing technological environment.

India (Government of India 2010)

The government makes a distinction between work-centred education, called 'v*ocationalised* education', and 'v*ocational* education', at the upper-secondary level. Currently, there is no relationship between these two components. Work education is included in the primary standards (grades 1–8) to help make students aware of the concept of work. At the lower-secondary level (grades 9–10), pre-vocational education exists which aims to increase students' familiarity with the world of work.

Vocational education is a distinct stream in upper-secondary education (grades 11–12). It was introduced in 1976–1977 and revisited in 1992–1993 as a way to diversify educational opportunities, enhance individual employability and reduce the mismatch between the supply of and demand for a skilled labour force. It was also aimed at diverting a substantial portion of students away from the 'academic' stream.

The need to bring together vocation and academic education at the level of policy plans has been recognised by the Indian government. On the one hand, a need to reconstruct the entire school curriculum (from preprimary to senior secondary) around a *common core curriculum,* that will incorporate work-based pedagogy initially until grade 10 and then up to grade 12, for all children, is stated. A set of work-related generic competencies (basic, interpersonal and systemic) are planned to be addressed at all stages of education and will be included in assessment. Amongst others, such generic competencies as 'critical thinking, transfer of learning, creativity, communication skills, aesthetics, work motivation, work ethics of collaboration, entrepreneurship and social accountability' are to be included.

On the other hand, strengthening the general education component of vocational education has been recognised as an important development. Vocational programmes are to provide sound basic knowledge in humanities and sciences, preparing students to work in various occupations, teaching them to be problem solvers and encouraging students to engage in lifelong learning.

Currently, vocational education in schools at the upper-secondary level is mainly offered by government schools, although in some states, private schools are also offering these courses. There are now about 9,583 schools (as of 2007) offering approximately 150 educational courses of 2 years duration in the broad areas of agriculture, business and commerce, engineering and technology, health and paramedical, home science and science and technology (Planning Commission, 2008, cited in Government of India 2010). Despite the fact that the 11th Five Year Plan aimed to double the number of schools offering VE (from 9,583 to 20,000, so that the intake capacity will increase from 1 million to 2.5 million), change has been very slow. The report (Government of India 2010) questioned the quality and relevance of VE provided at the upper-secondary level for equipping school children for the requirements of the world of work. Most courses are school-based. However, some of these have been perceived as a collaborative model with industry. The theory part of courses and some basic skills are developed in schools with there being a further refinement of skills in the actual industry.

India is amongst the countries with the lowest proportion of trained youth, 80% of new entrants to the workforce having no opportunity for skills training. The existing training capacity is 3.1 million per annum compared to 12.8 million new entrants to the workforce, annually. The government has taken due recognition of the skill gaps and plans to take new initiatives for bridging them. In this regard, the National Policy on Skill Development (Government of India 2009) provides a direction for skill development in the country.

Diversifying Postsecondary TVET

Many countries have taken steps to improve the articulation of secondary vocational education with higher education in order to open more options for students and to meet the increasing demand for skills and qualifications at ISCED Levels 4[7] (non-tertiary postsecondary) and 5 (first stage of tertiary studies) which are designed for employment in technical, managerial and professional occupations. As the demand for enrolment at the postsecondary and tertiary levels has increased

[7] Lower secondary (ISCED 2), upper-secondary level (ISCED 3), postsecondary non-tertiary education (ISCED 4) and tertiary-type B programmes (ISCED 5B) are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level (OECD 2002).

in most countries, pressure has grown for diversification of the types and modes of provision at these levels. The definition of programmes at Level 4 is extremely broad, and there is a wide range of programme types which may be classified here, ranging from short preemployment courses to longer courses oriented towards higher-level education and training. One area where there has been a marked rate of growth in participation across regions is in the provision of skills training programmes for lower- and middle-ranking administrative and technical occupations, particularly those involving business, administrative and ICT skills. Polytechnics in many countries, industrial training institutes in India and technical colleges in Sri Lanka belong to the postsecondary, non-tertiary level.

In many countries, this has led to the proliferation of new vocational programmes at Levels 4 and 5 such as 4-year institutions in Japan, 2-year community colleges with high vocational content in the United States and 2- or 3-year junior colleges in the Republic of Korea. In the Republic of Korea, 'junior colleges' (jeonmun daehack) were established in 1979 due to rapid industrialisation in the Republic of Korea and an increasing demand for middle-level technicians with both a theoretical understanding and practical skills (Goodman et al. 2009). Due to a thorough curriculum, strong school-industry cooperation, including internships, industry-based training for faculty members, education for mid-career industry employees, joint college/industry research programmes, information exchange, active work of industry/college cooperation committees and curriculum development at the industries' request, college graduates are highly valued in the Republic of Korea. Out of 80% high school graduates perusing further studies, 45% enrolled in colleges (Korean Council for College Education 2005: 41).

A comparable diversification has occurred in vocational tertiary programmes. As demand for tertiary education has increased, so many countries have substantially extended the range of the short- and medium-length vocational programmes available at ISCED 5B.[8] These have included developing skills for a large number of occupations which previously did not exist or for which there was previously no higher-level qualification. In some cases, these new programmes have been offered in the form of traditional university environments. However, for the most part, they have been developed in polytechnic-type tertiary vocational institutions. Community and technical colleges in the United States have developed *post-diploma* programmes to deliver such 'newer' skills to both degree and nondegree graduates, as well as for those wishing to upgrade their skills.

At the same time, as the range of types of programme has increased, in terms of content and intended labour market utility, so has the range of types in terms of provider institutions and modes of delivery. Many countries, most notably Malaysia and the Republic of Korea, have developed very extensive systems of open

[8] Tertiary-type B programmes (ISCED 5B) are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level (OECD 2002).

university distance education provision, both in general areas and TVET, although the latter is largely limited to what can be learnt without highly specialised and expensive equipment. The United States has also developed 'open college' TVET programmes. It is interesting to note that much of the new programmes are delivered by private providers, especially in Asia. They are often licensed and subsidised by the state but increasingly also include entirely independent providers, particularly at Level 4.

Vocationalisation of Higher Education[9]

Historically, vocational education and higher education emerged from opposing traditions, with the university producing systematic scientific knowledge and vocational education, training for specific occupations. As a result, university outputs were evaluated on the basis of their contributions to the respective scientific discipline (Klüver 1995) whilst vocational education outputs were concerned with the ability to undertake useful work. Those relationships have been established over time with socio-economic development influencing the process. Mass higher education, elite higher education, polytechnics and different levels of vocational institutions including higher vocational education established to train doctors, teachers and lawyers have been developing complex relationships within countries around the globe. Even countries within the European Union, such as Germany and the UK, which have market economies, have different approaches towards higher and vocational education. As stated by Hoelscher (2005), in Germany, higher education is more vocationally oriented than it is in the UK, and vocationalisation is more related to the development of specific skills that are tied closely to a particular occupation. In the UK, particular higher degrees do not lead into specific occupational fields because it is considered reasonable for individuals to invest in the development of general and transferable skills. At the same time, there is a wide range of extremely specialised, short-term programmes offering vocational qualifications.

Due to the changing nature of the state, the role of the university in the current economic climate is the topic of wide-ranging discussions, particularly in terms of the usefulness of the model that can be characterised as 'humanitarian university education'. The major point of criticism of this model is that it does not serve the demand for instrumental knowledge and specialisation, formulated by the so-called 'knowledge society'.

[9] This section is drawn on the background paper for UNESCO (2011) produced by the authors.

Levels of Debate

As argued elsewhere, current discourses on vocation and higher education relationships can be viewed at a number of levels – political/economic, epistemological and individual.

At the political level, the debate relates to human resource development issues and the need to increase employability, as discussed earlier in this chapter. Currently, the speed of transformation is far more intense than it has been in the past. As stated in the *life-based learning report* (Staron et al. 2006): 'The knowledge Era is characterised by impermanence, turbulence, multiple and competing agendas and priorities, diversity in ideologies, ambiguity, multiple roles, irritations, uncertainty and contradictions and a great amount of energy and creativity… The knowledge Era is an era of rapid movement. There is so much going on that we need new and meaningful ways to make sense of how to best work, learn and live effectively in these times' (pp.23). At the political level, the ideology of the detachment of university degrees, and their academic curricula, from labour markets, can be regarded as a negative trend in university development. It overlooks one of the important elements of any university: that of its students. Academically detached education is regarded as providing insufficient skills for the appropriate employability of university graduates.

Thus, at the political level, there is the basis for establishing close links between higher and vocational education.

At the epistemological level, the discourse on what is knowledge, and in particular what is worthwhile knowledge, has its influence on the concept of university knowledge. Some of the dichotomies presented in this discourse (such as the universal versus the particular, formal versus experienced-based, the search for truth versus the utilitarian and context-free versus context-dependent) position university knowledge much closer to the individual than to the discipline, and to a person's subjectivity, needs and experiences. Additionally, TVET is seen as 'a knowledge-based industry, where knowledge is its core business' (Staron et al. 2006: 24). Recent research on TVET (ibid) argues that life-based learning is required for vocational education, focusing on capability development and considering the learner as a whole person. 'The emphasis is on personal responsibility for learning through the provision of rich learning environments, with learning benefits for both the individual and the organisation' (ibid, pp.49). This model suggests using diverse, adaptive, self-facilitated approaches, based on reflexive practice strategies, to achieve the goals and aspirations of the individual. This broad interpretation of TVET training positions it closer to higher education. Thus, at the epistemological level, there is the basis for developing close relationships between higher and vocational education.

At the individual level, the personal needs of the student should be met through education. As stated by Nikolaou and Papadakis (2003), the ongoing revision of the relationship between education in general, university education and the labour market requires a 'balanced holism between the *economy-oriented view* – OECD, E.U. – and the *human-oriented approach* – UNESCO – of the Knowledge Society,

and the role of Higher Education in it' (pp.5). To achieve this, the development of regulatory mechanisms and frameworks that could shape particular policies needs to be developed. Structural changes, requirements of the globalised economy, interpretation of knowledge, the repositioning of the individual and his/her actions in the centre of the educational process, all need to be considered in order to harmonise higher education within counties' economies. An Australian study on learning pathways within and between TVET and higher education (Harris et al. 2006) identified five pathways within the overall framework of lifelong learning, these being:

- *Interest chasers*: when describing this pattern of movement, the terms used might be 'multidirectional', 'searching' or 'yo-yo': that is, bouncing between different fields of interest.
- *Career developers*: some participants showed a consistent interest, even though they may have made several sectoral moves. Sometimes, this looked like a domino pattern, where an element of one learning experience led to a sectoral move to further develop this as a career. This pattern was more linear, being less of a 'jump' than a 'flow' into another course of study.
- *Career mergers*: having explored interests in other areas, some participants then drew different experiences together to move into a more focused course of study. This was different from the 'career developer' pattern, in that it was usually non-linear.
- *Forced learners*: sometimes participants undertook what appeared to be a completely different course of study for professional development reasons. Sometimes, this change was due to a practical factor, which obliged them to undertake a particular course, such as affordability, location or entry requirements. This might appear to be a detour or sidestep.
- *Two trackers*: some more experienced respondents attempted to develop an alternative career, as insurance for a time when their current career was no longer possible. This pattern also occurred when students were trying to improve their chances of earning an income whilst studying. (pp.10)

These results highlight the role of personal choices, where an individual has autonomy to choose their pathway. The study also revealed that approximately 40% of all sectoral moves were within the same field of education. There were more movement within VET, both for the same and for different fields of education, than there was within the higher education sector. Students' interests as well as vocational reasons were behind their choices. Thus, at the individual level, in those countries where articulation between TVET and HE is in place, there is a freedom of movement between two sectors that are beneficial for students.

Issues with Statistics

Currently, it is difficult to capture TVET-related enrolments at the tertiary level. UNESCO's Institute for Statistics (UIS) focuses primarily on public provision and

in so doing distinguishes tertiary education by (1) programmes that lead students to further levels of education and are normally general education and (2) programmes that lead to the labour market and out of formal education.

Conservative estimates of tertiary education (Adams 2007) that is labour market-oriented hover around 25%. At the top end of the range are countries like Belgium (51.4%), Kenya (49.9%), Malaysia (47.3%), Mauritius (55%) and Slovenia (48.8%). At the low end are countries such as Finland (5.6%), Germany (15.2%), Italy (2.4%), Mexico (2.9%), the Netherlands (1.5%) and South Africa (14.3%).

Challenges and Issues

The main challenge is to link higher education with the constantly changing needs and opportunities of contemporary society and the economy. This is seen as an increasingly important issue by universities and politicians (European Commission 1995). Creating a fruitful and dynamic partnership between higher education and society at large has become one of the basic missions (together with teaching and research) of universities (e.g. Griffith University 2002; Dewar 2005). At the level of *structural change* in that respect, the following three trends can be seen as important:

- The distinction between top universities (highly selective admission) and mass universities (open to all school leavers) might influence the scope of their responses to the trends discussed above.
- Improvement of the reputation of vocational education and training, through developing it within the university sector, is seen as one way of establishing a close relationship between higher and vocational education. Higher vocational institutes in the PRC are an example of this approach, having been developed as an independent branch of the university sector.
- A common qualification framework for vocational and higher education, that reflects the interrelationships between the structure of educational qualifications and the occupational structure of the labour force, and between education and social change, could provide possible synergies between higher education and vocational education.

Some trends that are related to the challenge of the knowledge economy are:

- Development of interdisciplinary links across traditional academic disciplines, blurring the boundaries and developing new approaches towards knowledge production.
- Development of employability skills, that are required for all sectors of the economy, can be seen as a priority for both vocational and higher education. In Germany, for example, it is quite common that graduates with a bachelor's

degree undergo an apprenticeship in order to improve their employment opportunities (Rauner 2005).
- Lifelong learning as a way of responding to rapid knowledge development and market change is considered as being essential for both sectors.

In terms of human-oriented approaches and personal development, life-based learning can contribute towards the development of policies and practices. This learning should be personalised in the following ways: it should be self-directed, context-based, achieve work/life integration, holistic, learner as designer, adaptable and sustainable (Staron et al. 2006: 50).

A number of concerns expressed by both TVET and higher education practitioners[10] are:

- Changes in the nature of societies which relate to global economic competition and a request for graduates relevant to the needs of economies.
- Quality and standards. The distinction should be considered between a short- and medium-term orientation in qualification demands that are met through vocational training and long-term educational profiles for university qualifications. Thus, the goal of tertiary education must be sustainable and provide long-term usable professional education (Schulte 2005).
- Vocational qualifications should provide access to university education.
- University education for vocational education teachers is required which should include occupational domains and pedagogical qualifications.
- There is no one model approach that fits all because frameworks for the vocationalisation of higher education will be different in different contexts.

Implementation Modes

Different ways of implementing vocationalisation include incorporation of more vocationally oriented content and the provision of work-based learning/work experience; the delivering of cross-faculty courses and establishing of interdisciplinary research centres to overcome a segmented approach to knowledge development and acquisition; development of new programmes more oriented to market needs; inclusion of employability enhancing activities that are not related to content teaching; teaching towards attributes acknowledged by employers; recognition of prior learning for both vocational and higher education programmes, particularly as part of an increasing stress on the importance of lifelong learning; arrangements for the articulation and provision of enabling or bridging courses for those lacking knowledge and skills for the higher education programme; and inter-institutional collaborative arrangements between universities and colleges.

[10] As discussed at Bonn seminar on vocationalisation of higher education, 2005.

Many examples of successful vocationalisation programme can be found in the region. At Griffith University, Australia, the Industry Affiliates Program (IAP)[11] is a work-integrated learning programme designed to integrate undergraduate and post-graduate students into the workplace. This programme provides final year students with an opportunity to develop work-ready skills through the completion of an industry-based project designed to deliver meaningful outcomes for organisations. Through the IAP, industry can engage talented final year science, environment, engineering and technology students ready to contribute to their organisation. Amongst the essential characteristics of WIL are opportunities for students to experience highly authentic expressions of workplace practice, which are systematically built into the curricula. This integration of theoretical knowledge with practice could prepare students better for their future jobs. Although work-integrated learning (WIL) programmes have become increasingly popular in many countries, there is a lack of empirical evidence on the impact of WIL on students' preparedness for work or professional practice across multiple disciplines. The current project at Griffith University (the first of its kind in the Australian context) is assessing the impact of work-integrated learning (WIL) on student work-readiness.

Trends, concerns and examples of the vocationalisation of higher education represent the ways education is adjusting to changes in the socio-economic environment. These processes can be viewed as a way of achieving the harmonisation of universities with the country's economy.

What Is Next and Conclusions

The rapid transformation of societies in social, political, economic, technological and education spheres has changed perspectives on the need for, and nature of, vocational skills. The historical change of views on vocationalisation, from more educational to more functional (where the development of employability skills became the main focus), broadens the nature of vocationalisation and includes separate technical courses under its umbrella. This pattern is due to the gradual blending of general and vocational programmes which sometimes share up to 75% of content.

Countries in the region include the vocationalisation of both secondary and tertiary education in their educational policy agendas, considering the close correlation between upper-secondary TVET enrolments and countries' GDP, and the high demand for middle-level technicians and tertiary graduates with some vocational skills and experiences.

Considering the diversity of vocationalisation pathways at the secondary education level, and the variety of contexts, there is a danger of overgeneralisation.

[11] http://www.griffith.edu.au/industry-affiliates-program

However, it is clear that investments in vocational and technical skills at the level of secondary school can be an important factor in contributing to economic development and growth. To increase returns on investment, *demand-driven approaches* to vocationalisation need to be developed which are relevant to the particular stage of economic development, the type of economy and regional specificities. The nature of training also needs to be considered. For example, for countries at the innovation-driven stage level, such as Australia, the model of the training packages, and the competency-based training used in the country, might hinder effective innovation since this model focuses on current competencies rather than future innovation (Dalitz et al. 2011). It is important to include the development of employability skills in TVET training.

It has been argued that such trends as the expansion of the basis for vocationalisation, the merging of TVET and general education, enhancing the quality and delivery of vocationalisation and the move from specific job-skills training to flexible training can be observed in the region and need to be taken into account when developing policies and implementation processes for vocationalisation. The degree to which vocationalisation occurs, and its nature, depends on both the level of economic development and on cultural traditions. Social, economic and technology rationales are used by governments to decide on particular vocationalisation policies.

Countries which are not ranked highly in terms of the GDI 'can achieve large gains in competitiveness if they successfully implement reforms that improve their human capital' (Sabadie and Johansen 2010: 253). On the other hand, countries with a high ranking need to continue to pay attention to their human capital development in order to retain their competitive edge. Vocationalisation at the secondary level needs to provide students with skills, knowledge and judgments essential for a productive economy, with skilled labour. It should focus on the development of adaptable and transferable occupational skills, rather than on job-specific skills. At the postsecondary level, close links with industry are important, and the skills that are specific for the future occupation should be emphasised.

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Chapter 4
Education, Employability, Employment, and Entrepreneurship: Meeting the Challenge of the 4Es

Manish Sabharwal

Introduction

The poor functioning of the 3Es of education, employment and employability has resulted in growth not being translated into sustained poverty reduction in India. Added to this is the fourth E of entrepreneurship which, had it been effective, could have delivered the desired employment outcomes.

India, like many other Asian countries, is going through five labour market transitions: farm to nonfarm, rural to urban, unorganised to organised, subsistence self-employment to decent wage employment and school to work. India's population, long considered a curse, has turned into a desirable demographic dividend. But a demographic dividend does not mean just people; it means skilled, educated or employed people. This chapter derives on the experiences of TeamLease, a people supply chain company in India that has hired a person every five minutes for the last 5 years, but that is only 5% of the people who were seeking a job with us. TeamLease estimates that 57% of India's youth suffer some degree of unemployability, with the 82.5 million unemployable youth requiring different levels of 'skill repair' for employment: (1) last mile repair candidates requiring training for less than 6 months (5.3 million), (2) interventional repair candidates requiring training of 6 months to a year (21.9 million) and (3) structural repair candidates needing training of 1–2 years (55.4 million).

TeamLease studies show that 58% of India's youth suffer some degree of skill deprivation and unemployability is bigger issue than unemployment (TeamLease Services and Indian Institute of Job Training 2012). India must undertake reform of the Es to address sustainable poverty reduction.

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Reforming the Four Es

First E: Employment Reform

Problems with Matching and Connecting Supply to Demand

Peter Diamond's Nobel prize winning work on search costs in labour markets is very important in the context of emerging economies like India where matching labour demand and supply become difficult because most employment is in the informal sector, largely in agriculture, and the labour force has low levels of education and skills. Diamond points out that just as measured unemployment does not fully reflect the availability of workers to be hired, so too the measured level of vacancies does not fully reflect the availability of jobs (Diamond 2011). The challenges for matching are broad and deep in India.

Employment and productivity patterns reveal important mismatches. Ninety-three percent of the workforce in India is in informal employment, which suffers from subscale enterprises and overall low productivity. Fifty-eight percent of the workforce is in agricultural employment that contributes to only 15% of GDP. India produces 120 million tonnes of milk with 75 million people, compared to the United States that produces 60 million tonnes with 100,000 people. Only 12% of the workforce is in manufacturing employment, compared to 50% in the People's Republic of China (PRC). Low-skilled organised manufacturing would create a mezzanine layer that would enable the difficult farm to nonfarm transition. More than half of India's labour force is self-employed, which unfortunately does not signal entrepreneurial energy as most self-employed are working poor.

India has outdated and dysfunctional institutional mechanisms. In 2011, India's 1,200 employment exchanges run by the government provided only 300,000 jobs against the 40 million people who are registered in these employment exchanges. India's labour law regime favours informal employment and encourages the substitution of labour with capital. Many labour-intensive sectors like textiles and toys are more capital intensive in India than in the PRC. There are grossly inadequate social protection and benefit systems that are not employer oriented to the detriment of those in informal employment.

India has much lower rate of urbanisation compared to the PRC – only 34 cities with more than a million people in India versus the PRC's 250. India has 600,000 villages, a third of which have less than 200 people, which creates challenges for sustainable job creation, making it difficult to adopt cluster approaches to employment and economic activity. In this dispersed scenario, people needing employment are not in geographies that have high employment potential, and people have to be taken to places where there is work.

Possible Solutions for Employment Reform

Employment exchanges need a major revamping. Present employment exchanges do nothing but only register job seekers. They need to establish employer connections,

provide employee service and turn themselves into career centres. As most of the exchanges are situated in easily accessible locations and have decent infrastructure and have high youth awareness, they can be better leveraged. Public–private partnerships (PPPs) that marry public sector infrastructure with private sector software of people, processes and technology can vastly improve their effectiveness. Employment exchanges need to offer the five services of assessment, counselling, apprenticeships, training and jobs to become integrated career centres. These PPPs will not only increase employer interfaces but also help to diversify the role of employment exchanges beyond simple outcomes of only jobs. The state of Karnataka has decided to 'upgrade' its employment exchanges to Human Resource Development Centres (HRDCs) through the PPP modality. An employment exchange that earlier provided jobs to 50–60 candidates annually moved to providing jobs to over 2,000 job seekers in the first year of operations and HRDCs and has continued the trend every year since. A case study on the Karnataka model is included in Appendix 1.

A modern vibrant apprenticeship regime is another domain that will help to improve employment outcomes. Apprenticeships are a globally recognised vehicle for effective skill development because of the effectiveness of 'learning by doing' and 'learning while earning'. They improve the prospects of candidates' job prospects by providing them an opening balance of on-the-job experience. Direct employer involvement in apprenticeship programmes ensures relevance of the skills obtained. But India's apprenticeship regime requires an overhaul. There are only 300,000 formal apprentices in India, compared to even smaller countries like Germany and Japan that have 6 and 10 million apprentices, respectively. The success of apprenticeship programmes lies in combining the formal educational phase (training targeted at being effective in the workplace) with the workplace phase (training actually put to work and learning to be productive). Apprentices become 'employment ready' because of the synthesis of employability and employment. A number of recommendations to remodel the apprenticeship regime in India have been made, including encouragement and incentives to employers to support an expanded and flexible apprenticeship regime to not only create a human capital pipeline for themselves but also fulfil their corporate social responsibilities (Planning Commission Sub-Committee on Re-Modeling India's Apprenticeship Regime 2009).

Extensive labour law reform is required in India. The laws favour organised labour, trade unions and those currently in a job and discriminate against those who are outside the labour market (particularly the less skilled, less educated, people from small towns, women, etc.). Considering that labour law reform is controversial globally, it could be undertaken in a phased approach. A first phase could involve elimination of redundant laws and harmonisation and re-engineering of laws as required. In a second phase, more difficult issues of employment contracts, fixed term employment and issues related to trade unions need to be tackled. Bringing labour law within the ambit of state jurisdiction rather than legislated concurrently by the governments at the centre and the state may help to unblock the path for some crucial reforms.

There is a need to create a shared job framework that brings a much-needed alignment between supply and demand. A national framework and infrastructure for skill development that aligns occupation codes, entry gate assessment and exit gate certification is needed. This framework should allow real-time interfacing between the demand and supply side of the labour markets to not only enable better matching but allow changes to curriculum, job descriptions, job posting and assessments early enough to matter. TeamLease is in the process of creating a framework called TeamLease National Employment Framework that is detailed in Appendix 2.

Second E: Employability Reform

Problems with Improving Supply for Employability

The mismatch problem arises from the divergence in what employers are seeking in the candidates in addition to qualifications and the actual skills candidates have. This issue of employability skills is particularly important for those who are already in low-productivity jobs in the workforce or students who have completed their education but are unable to get a job. Improving the supply of educated people for employability is more than just qualifications.

The issue of financing training requires to be addressed. Employers face three holes in the training bucket: first, they pay for training, but the candidates do not pass or complete the training successfully (learning risk); second, they pay for training, and the candidate completes it successfully but does not perform in the workplace (productivity risk); and third, employers pay for training, and the candidate completes successfully and is productive in the workplace; however, he leaves (attrition risk). So employers are not willing to pay for training upfront but they are willing to give apprenticeship stipends or reimburse candidates for fees they have paid if they stay with them for some time. Employers are willing to hire trained workers. Candidates, on the other hand, are unwilling to pay for training but ready to pay for a job. Third-party financiers like micro-finance or banks are unwilling to lend for vocational training unless a job is guaranteed. The government financing is mostly towards inputs rather than towards outcomes. The comparative advantages of public and private sectors are not appropriately leveraged as considerable distrust exists with regard to the role of the private sector. This impedes effective structuring of PPPs and policy-based contracting arrangements.

This mismatch between what employers want and what they get is exacerbated due to a hard partition between education and training. The qualification corridor to enable vertical mobility between certificates, diplomas and degrees does not exist. This lowers the social signalling value of vocational training. Students who have undergone vocational training find it difficult to revert back to general streams of education to acquire higher qualifications. A pathway for a gradual upgrading

of skills and competencies even within the vocational stream is not very well organised.

Competency assessment and performance management in employability skills are not an area that has been given adequate attention. In addition to qualifications, there are no concrete metrics that help employers and institutions assess the employability skills. In India, there is wrong balance between exit and entry gates in educational institutions. An educational institution can be like the Indian Institutes of Management (IIMs) or Indian Institutes of Technology (IITs) with tight entry gates and wide open exit gates or like the Chartered Accountant exam with wide open entry gates and tight exit gates. Currently, vocational training has wide open entry and exit gates.

There is a lack of alignment between various parts of the skills, training and employment ecosystem that includes assessment, curriculum, certification and jobs. Unless training institutions are able to effectively take on board market demands and trends for skills, including employability skills in their curriculum and courses, and able to provide certification for well-defined skill sets, the employability mismatch will continue.

Possible Solutions for Employability Reform

Separating financing from delivery of skills development could ensure that delivery is undertaken by agencies that have requisite capacity. Usually, government money for skill delivery is only available for government delivery of training. Making government funds available for both public and private delivery would not only support agencies that meet the demand for employability skills but also facilitate more innovative delivery modes. A possible switch from financing institutions to financing students through instruments such as vouchers and scholarships will create competition and give choices to students.

Linking financing to desired outcomes would ensure that the right skills are ensured for people seeking jobs. Most government financing currently supports skill development linked to inputs, such as number of hours of training. If a mechanism to link this funding to expected learning outcomes or placements in jobs, using a neutral platform, can be designed for both private and public delivery, the quality of training and the competencies of trainees are likely to increase. This requires development of appropriate contracting mechanisms and accountability systems. A credible information about learning outcomes, placement record and teacher quality of training institutions can facilitate informed choice. An important gap could be filled by creating a rating or ranking system for institutions that would enable comparison and spur competition.

Linking poverty programmes to training may further support employability objectives of the poor. There are many social sector or poverty reduction schemes of the central and state governments which provide funds but do not create any capacities or change trajectories. It will not be easy given the state of delivery systems, but it is important to begin the journey to creating a skill, apprenticeship

or employment component in schemes like the National Rural Employment Guarantee Scheme (NREGS). A credible skill voucher or scholarship programme would enable a transparent, cashless transaction that would enable the trainee to get trained from any accredited institute and on completion of training the institute can redeem the voucher for cash. These schemes may also lay the foundations for collateral-free skill loans, and the proposed Credit Guarantee Fund is a useful infrastructure.

Integrating apprenticeships with training and placements will play a valuable role to increase employability of trained graduates. The limitation of a small number of apprentices in India goes beyond the matching of supply with demand problem it creates since most students end up with only theoretical knowledge. Formally integrating apprenticeships into skill and education programmes, with accumulation of credit for apprenticeships undertaken, would be important, and this requires a regulatory review that is overdue and urgent.

Creating a qualification corridor will go a long way in establishing and recognising qualifications and skills for employability. The current regulatory system does not allow the creation of a corridor or link between a 3-month certificate, a 1-year diploma, a 2-year associate degree and a 3-year degree. Vocational training is often 'tracked' and does not facilitate moving back and forth from the formal academic stream. The proposed National Vocational Education Qualification Framework currently under consideration, but struggling for regulatory legitimacy, would help in reducing the perpetual problem of 'social signalling value' of vocational training versus a degree.

Third E: Education Reform

Problems with Creating a Pipeline of Educated and Skilled Workers

The broad principles for a better educational regime have to do with better regulation of quality, incentives that are aligned and the creation of an ecosystem where preparation of educated and skilled workers is in line with the requirements of the future.

The key challenges that the education system faces are high dropouts at various stages of education. About 35% of students who start school do not reach grade 10. Of the 26 million who take the grade 10 exit examinations, 10 million do not pass. Eight million of the 16 million who take the grade 12 examinations fail to clear them. Only 5 million of the 8 million who successfully go past grade 12 examinations go on to college. Preparing a robust pipeline of educated and skilled workers and professionals requires improved completion and transition rates at lower levels of education. A robust basic and secondary education system, with adequate quality benchmarks, is crucial to ensure that higher levels of education and training have a good supply of well-prepared students.

The education system has low capacity. India's gross enrolment ratio (GER) at tertiary level at 11% is less half of the world average and much lower than the

developed country average of 45%. Only 15 million people are enrolled in higher education in India. The system also has low inclusiveness. The gross enrolment ratio is lower than average for women and disadvantaged populations. More than half the districts in the country have GERs that are lower than the national average. The proportion of poor and disadvantaged is also higher among those who drop out early from the education system which makes tertiary education enrolments and attainments inherently inequitable.

The system is mired in ineffectiveness as many graduates are unemployable because of a huge gap between what they are in person and what they are on paper. There have been instances of people who have a bachelor's degree in English who could not speak English. There is a strong partition in the mind of academics between learning for earning and learning for living. This is not a uniquely Indian phenomena; Yale said they did not want to run a 'trade school' and shut down their engineering school in the same year that Stanford started their industrial under Frank Terman – and catalysed Silicon Valley. Policy makers are preoccupied with vocationalisation of secondary education and related issues. There is need for a decentralised environment that encourages the entry of a range of educational and vocational training options across different levels and disciplines and allowing for free movement between them.

Possible Solutions for Education Reform

The Right to Education Act (RTE) in India, although has a right reason, is a wrong thing. Universal access to elementary education needs to be assured to all students in the country; however, the Act includes provisions that are not conducive to the expansion of unregulated private provision. Although the Act includes a 25% reservation for children from disadvantaged backgrounds in private schools, it promotes ineffective regulation on private education institutions. It has decreed the dismantling of low-cost unrecognised private schools that have contributed to increasing enrolment ratios. The RTE Act needs a full-fledged review in terms of ensuring a broad base of quality elementary education that reaches all over the country in partnership between private and public sectors. The regulatory focus is also on inputs, such as minimum conditions that must go into a school rather than outputs in terms of successful education completion or quality.

There is an urgent need to ameliorate the quality of school education rather than focus on the issue of vocationalisation. The issue of vocationalisation of school needs to be reviewed in the context of fast-changing technology and the market place that is calling for much higher-order foundational skills. It would be better to strengthen the quality of such foundational skills in school education that would provide an adequate base to students on which they can build specialised skills. This means focusing on the basics and fixing schools to make sure they impart adequate quality education to address the three Rs (reading, writing and arithmetic) along with communication skills and soft skills of curiosity, confidence, risk taking and team playing. The urgent need is thus one of creating a robust base of school education system that is aligned to the higher levels.

The creation of a qualification framework needs to address mobility of school dropouts, school completers and diploma holders to the world of degrees. This is proposed by the National Vocational Education Qualification Framework that is currently under consideration. Such a framework also needs to consider community colleges and associate degrees. About 50% of college enrolment in the United States is in community colleges offering 2-year associate degree programmes. These programmes are not normal degrees on a diet but vocational training on steroids and act as a mezzanine layer that bridges the worlds of vocational training and higher education. India needs to create a regulatory framework for these new types of qualifications to flourish. The current regulatory regime is overly focussed on inputs and uses infrastructure such as land and building as a poor proxy for accreditation. The regulatory regime needs to shift its focus from inputs to learning and employment outcomes. It also needs to increase the flexibility of institutions to address issues of employability, and this includes recognition of prior learning, credit for apprenticeships and a pathway for the gradual upgrading of skills.

Partnerships for education that legitimise the role and contribution of the private sector are crucial to build a robust pipeline of educated and trained people. Currently, schools and higher education need to be non-profit. But 90% of the capacity created in these sectors in the last 20 years has been for-profit in reality but complies with the non-profit structure on paper. This lower transparency is encouraged by court decisions that make a distinction between surplus and profit. This does not encourage the participation of legitimate private sector players to invest in the education sector. Regulation must be changed to formally and transparently allow corporations to invest in and contribute to the education sector. Making government funds available for private delivery of education and skills via vouchers or scholarships would amplify consumer choice, create competition and put pressure on institutions to perform. However, they require complex and effective arrangements for result-oriented contracting arrangements.

It is time to expand unconventional modes of education and to open the way for innovative and cost-effective methods of delivery. Expanding distance education is an obvious avenue. In addition, recent times have seen the proliferation of on-line and virtual education avenues that need to be explored for their quality and for their role in increasing access to education and supply of high-quality instruction. Opportunities for increasing e-learning and satellite-based delivery must be reviewed to offer flexible options for workers already in the workforce and the geographically disadvantaged.

Fourth E: Entrepreneurship Reform

Shortcomings for a Vibrant Entrepreneurial Culture in Education

The for-profit private sector already plays a large role in Indian education; however, the regulatory and policy framework does not recognise it as such. Ninety percent of schools and 85% of higher education setup in the last 10 years are for-profit in

spirit but non-profit in letter because they are organised as trusts or non-profit foundations. The lack of pragmatism in public policy in not recognising entrepreneurial motivations and structures for what they are is costing Indian education dearly. The case for the private sector is not because it provides better quality – in many situations it does not – but because the country needs all the schools we can get. The argument for-profit in education is not an argument against the expansion of state or non-profit initiatives. Much more capacity is needed in the war against illiteracy and unemployability. Yet today public policy mandates that accredited school and higher education are only delivered through a non-profit trust. But India's charitable or non-profit sector does not have the resources or capability to meet India's education challenge, and consequently most of India's private sector is for-profit, however, under a legal non-profit provision. This transmission loss between how the law is written, interpreted, practised and enforced has undesirable costs.

A more conducive regulatory framework will allow for more promising entrepreneurs to enter the education market. Policies that prohibit profits in education and keep fees low should be replaced with more open competition based on transparent rules. In India, current trends reveal supply crossing demand in engineering (100 colleges in South India received less than 10 admissions) and MBA schools (300 of the 3,000 schools in the country are on the verge of closure). This propagation of oversupply to other parts of the education ecosystem – K-12, Medicine, Law, etc. – will force opportunist edupreneurs out and attract legitimate and professional investors that will reinforce the circle of quality.

Possible Solutions for Entrepreneurship Reform

Private sector participation is needed for the impossible trinity of cost, quality and scale. India needs large numbers of classrooms and teachers. But the regulations impose substantial limitations on first-generation entrepreneurs raising money from financial investors – both debt and equity – to invest in creating legitimate quality at scale. While there has been a reasonable quantitative expansion by the government, there is a need for professionally managed, well-regulated and quality-mindful for-profit private sector. The current regulations in higher education lead to an adverse selection among education entrepreneurs because it biases the field in favour of politicians, criminals and land mafia.

The lack of employability is pervasive among youth entering the labour force. This low employability arises for many reasons: lower competition, centralised setting of curriculum, no modularity for skill upgrading, lack of employer involvement and lack of credit for formal apprenticeships. But it is unclear that this agenda can be implemented by pure regulatory reform; it will need to be complemented by a Cambrian explosion of entrepreneurship that being capital, innovation and energy. This is unlikely without allowing entrepreneurs and third-party capital to work together legitimately. Rabindranath Tagore has a wonderful story called Kartar Bhooth where guessing the perceived and static wishes of an effective but

dead leader stifles current life and kills innovation. The ghost of non-profit in education has similar consequences where low-quality private sector capacity creation becomes a self-reinforcing argument against legitimising a professionally managed, well-regulated and quality-minded for-profit private sector.

Conclusions

The reform of the 3E ecosystem in India is currently stalled. Public policy has not advanced this agenda as there is no Ministry of Employment. While the 3Es relate to horizontal issues, the government is organised vertically.

India's, and probably Asia's, 3E opportunity is probably one of the biggest entrepreneurial opportunities on the planet in the next 20 years. Most people focus on flow – theone million young people joining the labour force every month for the next 20 years – but a bigger opportunity is stock – retooling the 200 million who are already in the labour force but stuck at low productivity in farms and elsewhere.

The solution lies in the creation of institutions which innovate at the intersection of the 3Es. Policy makers, parents, employers and children are looking for something that is part college, part skill centre and part employment exchange. Like all innovations, creating such an institution is difficult, takes time and needs resources. But this is not noble; it is necessary.

It is late but not too late to change the tragic reality that the two most important decisions a child in India makes are choosing their parents and pin code wisely. Mughal Emperor Jahangir told his gardener in northern India that if a tree takes 100 years to mature, that is all the more reason to plant it as soon as possible. In other words, the best time to start changing our 3E system was 50 years ago. The second best time is today.

Appendix 1

Box 1 Case Study on Public–Private Employment Exchange

Karnataka has over 34 Employment Exchanges, scheduled to cater to the employment needs of the job seekers and the employee needs of the organisations. However, this matching of demand and supply was not effective, and the objectives of the Employment Exchanges were not being met.

Traditionally, Employment Exchanges had only a binary outcome – you either get a job or you do not. However, this is redundant in the current context. Employment Exchanges across the country as well as in Karnataka do nothing but register job seekers, do not have easily accessible and well-organised databases and have not been proactive. However, most of the exchanges are situated in easily accessible locations and have decent infrastructure (though not properly maintained), and awareness of the exchange among candidates is high. Policy makers can use existing infrastructures so neither the government nor the private party makes higher investments on hardware (infrastructure and other capital-intensive requirements) but diverts the resources to software (people, processes, technology, output).

Employment Exchanges in Karnataka have been mostly attracting either ITI students or those who are in the lookout of public sector employment. The registration ensures that 'they are in a queue' and whenever their turn comes and if there is a job available, they would be called. There has been no matching or counselling to either the job seeker or the industry.

Public–private partnerships for Employment Exchanges were put on the agenda in a budget speech announcement more than 3 years ago. But like most government transformations, this project suffered from a traffic jam at the intersection of the central and state governments. However, Karnataka made the maximum of this opportunity. The Karnataka Vocational Skills and Training Development Corporation (KVTSDC) and the Department of Employment and Training (DET) not only identified this as a problem area but also developed a PPP model with TeamLease Services to ensure that the then almost defunct exchanges upgrade to something more substantial.

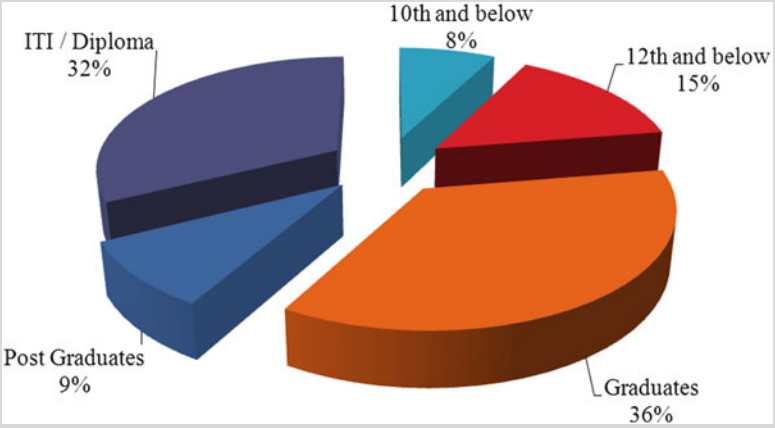
The upgraded Employment Exchanges or Human Resource Development Centers (HRDCs) attracted job seekers and industries across the spectrum, which was unthinkable in the original format of Employment Exchanges.

- Employability solutions such as assessments, counselling and skills development are now being provided to various categories of job seekers such as:
  - Commerce, science and arts graduates
  - School dropouts
  - 10th/12th pass students
  - Skill upgradation of workers employed in various industries
  - ITI tradesmen

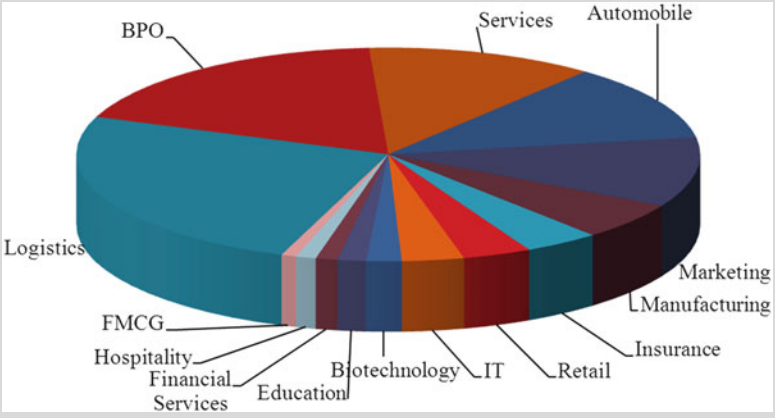
(continued)

- Scientific matching by way of assessments and counselling helps the Employment Exchanges to provide the right job to the right job seeker.
- Private sector employers have started viewing the Employment Exchanges as a source of hiring manpower for their needs.

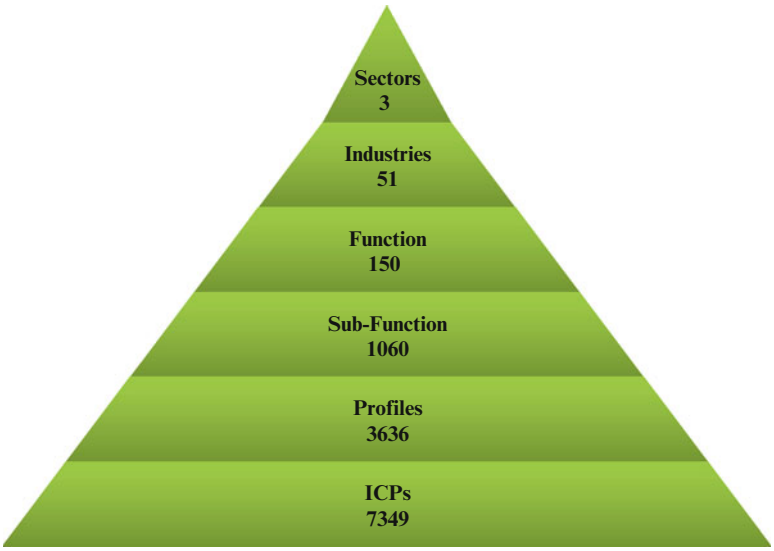
Profile of registered job seekers at the HRDCs



Profile of Private Sector Employers hiring from the HRDCs



Appendix 2: TeamLease National Employment Framework



Introduction

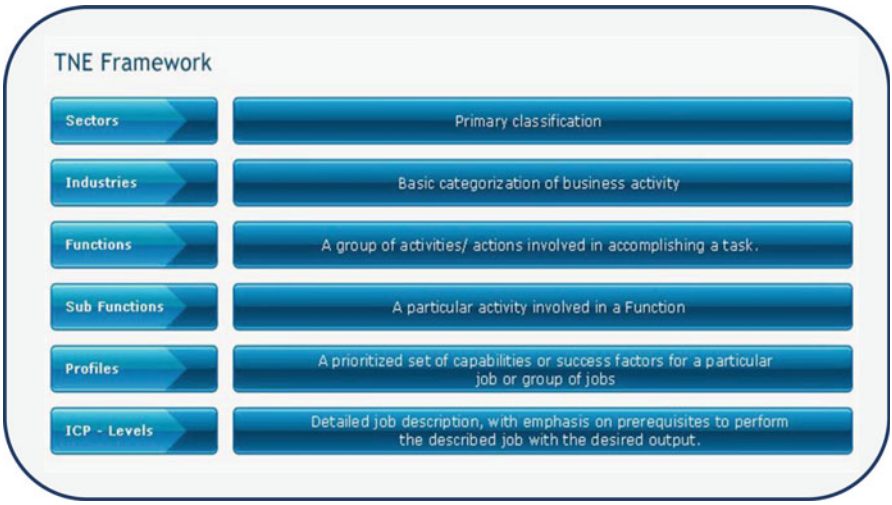
The *TeamLease National Employment Framework* (TNEF) is a systematic classification of jobs in the Indian labour market based on *data, skill, knowledge and behaviour* required for the job, and vice versa. TNEF is a framework that links industries with types of jobs. TNEF is tool to candidates identify industries or any profile and creates an interface between demand and supply.

The Department General of Employment and Training, Government of India, has built the National Code of Occupation (NCO), which was the first attempt in the direction of preparing an occupational classification system in India way back in 1946. However, the NCO updation has been able to catch up on the rapid industry growth as well as entry of new age sectors such as services, retail, IT and ITes.

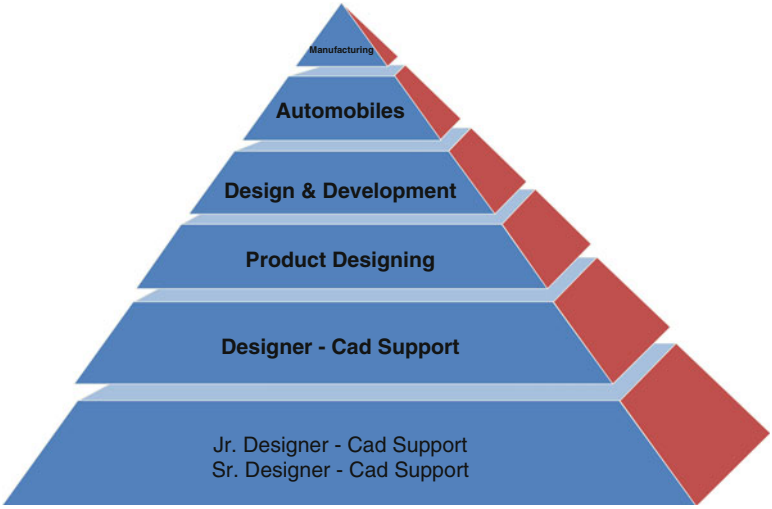
The need for TNEF was thereby felt by TeamLease such that there would be a scientific job mapping tool for both the job seekers and the industry.

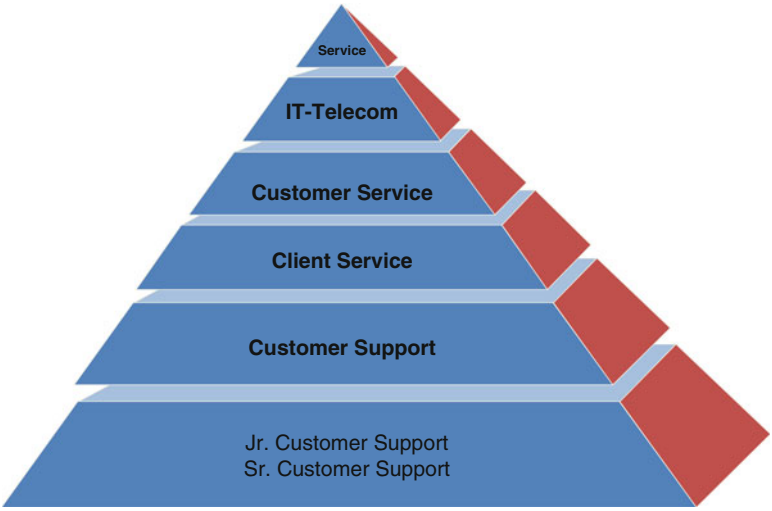
The TNE Framework appreciates that fact that there are different skill requirements for different sectors and one shoe will not fit all. TNEF breaks down the attributes for an individual job profile across six parameters, i.e. sectors, industries, functions, sub-functions, profiles and ICPs (Ideal Candidate Profiles).

The classifications are depicted in the picture given below.



A depiction of how TNEF helps identify the best fit for a particular sector and industry is shown below for Services & Manufacturing:





There are over 50 industries that have been mapped under TNEF. List of these industries is given below for reference:

TNEF Industrial Classification		
Automobile / automotive / auto ancillaries / auto components	Agriculture / poultry / fisheries / forestry / dairy / fertilizer	Aerospace / aviation
		Electrical and electronics
	Airlines and aviation	Fashion / garments / merchandising / modelling / apparel
	Biotechnology / pharmaceutical / medicine	Packaging industry
	Capital goods / machine manufacturing / heavy industry machinery / safety equipment / control equipments	Textiles
	Cement / marble / ceramics / stones /	Sugar
Banking	Engineering, procurement and construction	Beauty / fitness
Financial Services	Entertainment / media (tv / films / production) / journalism	Business / management consulting / consulting services
Insurance	Fertilizers, chemicals, paints, dyes and industrial chemicals	Construction / building / real estate
Consumer goods – durables / home appliances	Food processing / beverages /catering / food services	Engineering / technical consulting science and technology
Consumer products / FMCG	Marketing / advertising / market research / public relations / event management	Environment / health / safety
Courier / logistics / packaging / freight forwarding / distribution	Metal / steel / iron / metallurgy	Export / import / merchandising
ITES – BPO / call center / KPO / RPO / med.trans	Mining	General and wholesale trading
Power / energy – generation and transmission	Oil and gas-exploration, extraction, refining	Guards / security services
Retailing	Paper / publishing / printing / stationery	Library / museum
Telecom and ISP	Rubber / plastic / glass / wood / polymer / fibre	Recruitment / placement agencies
Hospitality, hotels, resorts and restaurants	Teaching / education / training	Social services / NGO
Healthcare / paramedical	transportation (surface / air / marine transport)	Sports / recreation
IT	Travel & tourism (reservations / ticketing travel)	Gems and jewellery

Ideal Candidate Profile (ICP)

An ICP is a detailed job description, with emphasis on prerequisites to perform the described job for the desired output. It is the foundation of TNEF. It specifies appropriate sets of score to data, skill, knowledge and behaviour. Sample ICPs are listed below for reference.

Sample ICP for a Financial Analyst

MAS-OS-FAN-A2030K	
Profile	Financial analyst
Brief about the profile	The job would involve conducting quantitative analysis of information affecting investment programmes of public or private institutions; analysing financial information to produce forecasts of business, industry and economic conditions for use in making investment decisions; assembling spreadsheets and draw charts and graphs used to illustrate technical reports, using computer; evaluating and comparing the relative quality of various securities in a given industry; interpreting data affecting investment programmes, such as price, yield, stability, future trends in investment risks and economic influences; maintaining knowledge and stays abreast of developments in the fields of industrial technology, business, finance and economic theory; monitoring fundamental economic, industrial and corporate developments through the analysis of information obtained from financial publications and services, investment banking firms, government agencies, trade publications, company sources and personal interviews. Preparing plans of action for investment based on financial analyses. Present oral and written reports on general economic trends, individual corporations and entire industries; recommending investments and investment timing to companies, investment firm staff or the investing public; and collaborating with investment bankers to attract new corporate clients to securities firms
Age	25–35
Gender	M, F
Education	Bcom, Mcom, CA, ICWA, MBA
Experience	3–5 years
Salary expectation	20,000–30,000

Behaviour

Attributes	Acceptable score	Description
Assertive	6–8	The quality of relating well with people, expressing needs freely, taking responsibility for one's feelings and standing up for oneself when necessary
Assertive AE	6–8	The quality of relating well with people, expressing needs freely, taking responsibility for one's feelings and standing up for oneself when necessary

(continued)

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Attributes	Acceptable score	Description
Confidence	6–8	The general sense of adequacy, which is likely to contribute to a person's effectiveness in working for a task-related goal
Confidence AE	6–8	The general sense of adequacy, which is likely to contribute to a person's effectiveness in working for a task-related goal
Consistency	6–8	To repeatedly be able to perform effectively, also firmness of character
Consistency AE	6–8	To repeatedly be able to perform effectively and also firmness of character
Persistence	7–8	The quality of continuing steadily despite problems or difficulties
Exploratory	6–8	This is the scientific, task-oriented type who likes to learn, know, analyse and observe and prefers work that requires abstract thinking and creative problem-solving
Appearance	6–8	Outward or visible aspect of a person especially with regard to personal cleanliness and neatness of clothing
Motivation	6–8	Motivation is what drives one to behave in a certain way or take a particular action
Motivation AE	6–8	Motivation is what drives one to behave in a certain way or take a particular action
Maturity	5–7	The capacity to face unpleasantness and frustration, discomfort and defeat without complaint or collapse
Maturity AE	5–7	The capacity to face unpleasantness and frustration, discomfort and defeat without complaint or collapse
Responsibility	6–8	The state of being accountable or answerable

Knowledge

Attributes	Acceptable score	Description
English	6–8	The fluency of spoken language, written and its comprehension
English AE	6–8	The fluency of spoken language, written and its comprehension
MS Office tools	7–9	Knowledge of various MS packages like MS Word, Excel, PowerPoint and Outlook
Economics and accounting	7–9	Knowledge of economic and accounting principles and practices, the financial markets, banking and the analysis and reporting of financial data
Mathematics	7–9	Knowledge of arithmetic, algebra, geometry, calculus, statistics and their applications

Skill

Attributes	Acceptable score	Description
Communication skills	6–8	The ability to listen, to articulate and to ensure that understanding happens at both ends
Communication skills AE	6–8	The ability to listen, to articulate and to ensure that understanding happens at both ends
Interpersonal skills	5–7	The goal-directed behaviours used in interactions which aim at bringing about a desired state of affairs. Also how one builds rapport

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Attributes	Acceptable score	Description
Problem sensitivity	6–8	The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognising there is a problem
Analytical skills	7–9	The ability to solve problems and make decisions that make sense based on available information
Analytical skills AE	7–9	The ability to solve problems and make decisions that make sense based on available information
Observation skills	7–9	The ability of taking notice, the act of seeing or fixing the mind upon anything
Problem-solving skills_M	6–8	The ability to understand and deal with difficult questions or things applying logic or reasoning to review information. Identify problems and their causes, evaluate options and select the best solution
Problem-solving skills_AE	6–8	The ability to understand and deal with difficult questions or things applying logic or reasoning to review information. Identify problems and their causes, evaluate options and select the best solution
Critical thinking_M	6–8	The ability to analyse, evaluate, synthesise and reconstruct thinking
Critical thinking_AE	6–8	The ability to analyse, evaluate, synthesise and reconstruct thinking
Decision-making skills	6–8	The outcome of mental processes leading to the selection of a course of action among several alternatives
Decision-making skills AE	6–8	The outcome of mental processes leading to the selection of a course of action among several alternatives

Sample ICP for a Jr. Software Engineer

MAS-OS-SWE-A0812K	
Profile	Jr. software engineer
Brief about the profile	The job would be to research, design and develop computer software systems, in conjunction with hardware product development, for medical, industrial, communications, aerospace and scientific applications, applying principles and techniques of computer science, engineering and mathematical analysis: analyse software requirements to determine feasibility of design within time and cost constraints. Consult with hardware engineers and other engineering staff to evaluate interface between hardware and software, and operational and performance requirements of overall system. Formulate and design software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Develop and direct software system testing procedures, programming and documentation. Consult with customer concerning maintenance of software system. May coordinate installation of software system

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MAS-OS-SWE-A0812K	
Profile	Jr. software engineer
Age	22–26
Gender	M, F
Education	BE, BTech, ME
Experience	0–1 year
Salary Expectation	8,000–12,000

Behaviour

Attributes	Acceptable score	Description
Confidence	4–6	The general sense of adequacy, which is likely to contribute to a person's effectiveness in working for a task-related goal
Confidence AE	4–6	The general sense of adequacy, which is likely to contribute to a person's effectiveness in working for a task-related goal
Patience	4–6	The ability to endure waiting, delay or provocation without being annoyed or upset or to persevere calmly when faced with difficulties
Patience AE	4–6	The ability to endure waiting, delay or provocation without being annoyed or upset or to persevere calmly when faced with difficulties
Adaptability	4–6	The ability to change(or be changed) to fit changed circumstances
Consistency AE	4–6	To repeatedly be able to perform effectively, also firmness of character
Reliable	4–6	To be trusted to do what one has been asked to do
Rational	5–7	Governed by, or showing evidence of, clear and sensible thinking and judgement, based on reason rather than emotion or prejudice
Methodical	5–7	Characterised by method and orderliness

Knowledge

Attributes	Acceptable score	Description
English	4–6	The fluency of spoken language, written and its comprehension
English AE	4–6	The fluency of spoken language, written and its comprehension
Knowledge of engineering	5–7	Knowledge of the practical application of engineering science. This includes applying principles, techniques, procedures and equipment to the design and production of various goods and services

Skill

Attributes	Acceptable score	Description
Communication skills	4–6	The ability to listen, to articulate and to ensure that understanding happens at both ends
Communication skills AE	4–6	The ability to listen, to articulate and to ensure that understanding happens at both ends

(continued)

(continued)

Attributes	Acceptable score	Description
Interpersonal skills	5–7	The goal-directed behaviours used in interactions which aim at bringing about a desired state of affairs. Also how one builds rapport
Observation skill	4–6	The ability of taking notice, the act of seeing or fixing the mind upon anything
Analytical skill	4–6	The ability to solve problems and make decisions that make sense based on available information
Analytical skill AE	4–6	The ability to solve problems and make decisions that make sense based on available information
Decision-making skills	4–6	The outcome of mental processes leading to the selection of a course of action among several alternatives
Decision-making skills AE	4–6	The outcome of mental processes leading to the selection of a course of action among several alternatives
Critical thinking	4–6	The ability to analyse, evaluate, synthesise and reconstruct thinking
Critical thinking AE	4–6	The ability to analyse, evaluate, synthesise and reconstruct thinking
Observation skills	4–6	The ability of taking notice, the act of seeing or fixing the mind upon anything
Proactive_M	4–6	The ability of an individual to take initiative
Proactive_AE	4–6	The ability of an individual to take initiative
Problem-solving skills_M	4–6	The ability to understand and deal with difficult questions or things applying logic or reasoning to review information. Identify problems and their causes, evaluate options and select the best solution
Problem-solving skills_AE	4–6	The ability to understand and deal with difficult questions or things applying logic or reasoning to review information. Identify problems and their causes, evaluate options and select the best solution

Benefits of TNEF

Government

- Create employment opportunities for unclassified and classified segment
- Address skill gaps
- Better fitment and placement

Industries

- Access to assessed candidates with the right skills and behaviour
- Better fitment, thus better performance

Candidate

- Employment opportunity
- Personality mapping
- Skill gap analysis

General

- Ready Reckoner for understanding of industries, functions, sub-functions and profiles

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Chapter 5
Coping with Rural Transformation and the Movement of Workers from Rural Areas to Cities: The People's Republic of China Sunshine Project

Li Wang and Greg Shaw

Background

Since the reform and opening up that began in 1978, extensive and profound changes have taken place in every aspect of Chinese society. The market economy has rapidly developed, and the scale of economic activity continues to grow such that the People's Republic of China (PRC) now is recognised as the world's second largest economy. The PRC continues to develop its industry activity, particularly secondary industries which have taken on increased prominence in the PRC economy, as the PRC strengthens its position as the world's manufacturer. Industrialisation has brought with it a significant urbanisation of Chinese society such that by 2012 for the first time, a majority of Chinese people lived in urban environments. The PRC entry in the World Trade Organization (WTO) in 2001 is one of the hallmark features of its national development strategy. Policy initiatives that have driven these achievements have resulted in a transformation of the PRC economy, though they have also impacted on the PRC political, environmental and social system. Additionally, there has been significant increase in agricultural production, despite declining arable land. More efficient farming techniques requiring less labour and the consolidation of smallholder plots into larger farms, in concert with increasing populations, have created an excess of labour in rural areas. However, as vocational opportunities in rural areas have changed or decreased, demand for labour in urban and industrialised areas has increased, as the PRC expanded its industrialised activity and output. This has driven labour demand and

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provided opportunity to tap into excess labour resources in rural areas. To facilitate the mass movement of labour from rural areas into industrialised and urban areas has required removal of systematic and structural impediments that have hindered the socio-economic development. Such impediments particularly affected rural workers. However, by creating diverse opportunities for employment for rural migrant workers in towns and cities and factories and through facilitating retraining and support for these workers, the PRC has achieved what in many ways is a miracle of social and vocational readjustment.

Rural Labour Migration: Challenges

Based on current vocational opportunities, there are 280 million surplus labourers in rural PRC, who in the past would have worked in vocational activity in rural areas or would have been peasant farmers. It is estimated that an additional six million unemployed rural workers become available each year. Such a significant number of people with vocational aspirations, and who need income in order to survive and to provide for their families, generate a significant potential social disruption for the Chinese society if not addressed. Of these surplus labourers, 87.8% have an educational level of junior high and below, only 0.52% of rural labourers have a college or higher education, and only 9.1% have received professional training. While such educational background may have been satisfactory for work and vocational activity in rural industries, it does not adequately reflect the particular skill and education needs that labourers and workers require in order to participate as skilled workers in industrial and other occupations in urban areas.

Therefore, it is critically important for the PRC's ongoing development, and for the provision of the needs of individuals, that education and training of rural workers suitable for employment in urban and industrialised settings be provided. Strengthening the education and training of rural people to help improve the quality of their lives and enhance their employability are vital. Increased education, and focused and specific training, improves the income generation potential of the PRC's surplus rural labour and facilitates a smooth and socially stable transfer of work from agrarian activity in rural contexts to non-agrarian activity in urban contexts. However, this has presented challenging policy implications for the PRC.

Retraining of surplus rural labour in order to meet labour demand in the PRC's rapidly industrialising sectors is only part of the story. The surplus rural labour is located in rural areas, whereas the majority of development and industrialisation is taking place in the major urban areas, although there is significant urbanisation and industrialisation of many regions and areas in the PRC that were in the past considered rural.

Consequently, two major population adjustments have been occurring in the PRC. First, workers are displaced as work opportunities dry up in rural areas or where smallholding blocks farmed by individual farmers are consolidated into larger farms requiring fewer workers. Such displaced workers will either naturally migrate to urban and industrialised areas in search of work or quite often as a result

of land acquisition by will be given favourable treatment in taking up housing in urbanised centres. Such physical relocation of accommodation involves relocation not only of the labourer but also of their family. Such migrations are usually permanent, as they involve a relocation of their and their family's accommodation. In any case, unless the persons and their family have alternate sources of income (such as a pension), they will be in need of money in which to live.

A second population migration occurs on an annual basis. This is often referred to in the PRC as 'the floating population', and the numbers are staggering. In 2005, the numbers were estimated as 150 million people. Migrant labourers mostly come from the PRC's underdeveloped western and central provinces such as Sichuan, Anhui, He'nan and Gansu and mainly head to urban areas, south-eastern coastal locations and metropolises like Beijing and Shanghai, as well as nearby townships, surrounding counties, small cities and provincial capitals. By 2020, it is estimated that another 100–150 million 'surplus' rural labourers will join the rural labour migration, with estimates that the total numbers will be in excess of 300 million people. These workers, move to towns and cities either in search of work or to take up work. Then, every Spring Festival and during the two other major holidays, when most industries closed down, these migrant labourers catch millions of buses and trains and migrate back home in order to have time with their families during the most significant social reunion time within Chinese culture.

Rural-urban migration has had an economic impact on the PRC. In 2003, it was estimated that labour migration from rural to urban areas contributed about 16% of the total growth of the PRC's GDP over the previous 20 years (Huang and Pieke 2003).

In 2001, the rate of urbanisation of the PRC was 37%. Following the reform and opening policy (Sun 2011), urbanisation in the PRC increased in rate. By the end of 2011, the mainland of the PRC had a total urban population of 691 million or 51.3% of the total population, rising from 26% in 1990, and it is estimated to be 70% by 2050 (Knight et al. 2011). Additionally, migrant labourers are young and 70% are between 16 and 35 years of age, and most have completed a junior middle school level of education (9 years in school). Most migrant labourers earn a monthly income from 300 Yuan (US$36) to 600 Yuan (US$72). About one-third of migrant labourers are female. Most migrant labourers are employed in blue-collar jobs which urban dwellers are unwilling to undertake.

In recent years, government policy has gradually reflected by greater appreciation of the contribution that rural migrant labourers make to the economy and the need to address inequities in the labour market and in social justice. However, even though many policies have been developed to protect rural migrant labourers and to promote rural labour migration, issues such as poverty and poverty reduction, especially in terms of incapacity and social exclusion of rural migrants, were not addressed seriously prior to 2004. Fundamentally, the PRC government needed to address the growing problems presented through massive unemployment and underemployment of rural people and the inherent issues of poverty and restriction of national growth and prosperity for all.

The Sunshine Project

One concrete example of this policy shift is the *Sunshine Project* (Shaohua 2005), launched in 2004 jointly by six national ministries, namely, the Ministry of Agriculture (MOA), Ministry of Labour and Social Security (MOLSS), Ministry of Education (MOE), Ministry of Science and Technology (MOST), Ministry of Construction (MOC) and Ministry of Finance (MOF). The *Sunshine Project* is one of the major components of the *Training Plan for Nationwide Rural Migrant Workers (2003–2010)*.

The programme is scaffolded by action research (De Vos et al. 2011) and involves social science researchers and educators in designing, monitoring and evaluating the specific components and activities of the programme. These include skills training (Majumdar 2011), practical focused education (such as law and health awareness), network building (Kilpatrick et al. 2011) and social capital building (Bird Hulme et al. 2002), which were executed in eight selected pilot sites at the beginning of the project. Generally, the programme examines, advocates and implements proactive, positive and practical policy changes to reduce poverty among rural labour migrants in terms of addressing capacity and social exclusion, especially from a gender perspective. The programme promotes local development through rural labour migration and attempts to establish 'win-win' partnerships between different regions (sending and receiving areas; western, central and eastern regions; underdeveloped and developed regions). The programme is primarily about supporting rural people in undertaking the substantial vocational and social changes occurring in their lives.

The Sunshine Project is the implementation of a key and proactive policy shift undertaken by the PRC government. It is not one project, but as indicated above, is a series of activities, policies and national and local initiatives all centred on various aspects of training and support of surplus rural labour in order to provide for the labour needs of urban and industrial the PRC. Additionally, it is a social reconstruction instrument, reprioritising and reorganising the structures of Chinese communities and vocational and industrial activity. It is partly a response to changes that occurred naturally as the PRC, like all other countries, continued to urbanise and industrialise. However, it is also a strategic long-term social planning exercise, to ensure that Chinese society and its economy transition into modern and stable entities, with minimal social and political disruption. Indeed, it is the world's largest project focused on retraining for rural workers.

Conditions for the Sunshine Project

It is internationally widely held that the PRC is indeed an economic miracle (Chen et al. 2009). Coming from a very low base of development and extreme levels of poverty, the PRC government over the last 50 years has steered a remarkable

course of development not only for the nation but also for hundreds of millions of its citizens. The PRC now stands proud as the second largest economy in the world, and in times of great uncertainty, and with subdued economic development across most of the world, the PRC stands almost alone with continued economic development, activity and growth. However, such success has not come without its problems (Zhang 2012) and without the need for major structural reform (Prasad 2009).

The PRC's economic growth has come primarily from its industrialised base. Many comment on the PRC being the factory to the world (Chow 2011). The most significant resource that has allowed the PRC to achieve this status is the sheer numbers of workers viable to participate in industrial vocations and the relatively low base of salaries that they are paid. In addition, the participation of state-owned and state-backed enterprise has allowed substantial investment in industrial capacity and significant economies of scale across a whole range of associated factors such as logistics and infrastructure. In some ways, the PRC is an enterprise. National development of infrastructure such as railway, road transport power generation and water resources has become not only a way of improving the lives of people who benefit from this, but ensures efficient and effective environments in which to locate industry and to facilitate supply of raw materials and export of finished products. Such national projects as well rely upon a significant number of excess rural labourers, as does the burgeoning building and housing construction industry.

This economic growth has brought about an enormous and rapid change in population distribution. During the last two decades of the twentieth century, the PRC's rural population remained above 800 million people—two to three times that of the urban population. However, by 2010, the rural population was equal to urban population, and, from about that year, a reverse trend was obvious, whereby urban populations were larger than rural populations. Such population swing from rural to urban has exacerbated the natural significant population growth of the PRC and is reflected in the growth of towns and cities. There are over 120 cities and built-up areas in the PRC with a population over one million people (PRC National Bureau of Statistics 2012). Also, significant areas on the east coast of the PRC, while may be classified as rural, have very high population densities and 'villages', towns and cities that are distinctly urban'.

This substantial shift in population location, from rural to urban, has occurred relatively quickly and as noted is a consequence of changes in agricultural activity and increased opportunities for employment with relatively high salaries in emerging manufacturing sectors located in urban areas. However, this population adjustment has resulted in substantial disruption and unemployment or under employment (Ma 2012). The task is to match the unemployed rural labour with jobs. This is something that the Sunshine Project attempts to do. Balancing the itinerant rural labour supply against the labour market is a delicate issue, and it is critical that the PRC achieves this as millions of discontented and unemployed rural workers will not help social cohesion and stability.

Being the 'factory to the world' relies upon other countries, particularly developed countries, to have sustained economic activity and prosperity placing demand

on the goods that the PRC produces. However, the continuing economic crisis that began in 2007, and the increased instability apparent from the economic and political crisis in Europe, has placed additional downward pressure on imports of PRC goods. Consequently, the PRC has suffered a downturn in the growth rate (Liang 2012). And if the PRC suffers further slowing and problems with its overpriced housing markets, the world will be in for further pain and suffering. Yet the PRC does have a significant local market, and 1.2 billion consumers can make a major difference in ensuring that manufacturing and economic activity continues to grow.

In the past, PRC policy placed major restrictions on the movement of people through the household registration system, in order to ensure a balance and status quo. However, since 2000, the government has implemented a number of policies both allowing greater flow of labour and also to protect migrant workers' rights and interests. Consequently, the number of rural workers who migrated and found jobs in urban areas has changed from approximately 98,000,000 in 2003 to more than 145 million in 2009 (Giles et al. 2012).

The Sunshine Project Methodology

As a series of policy initiatives focused on bringing about greater efficiencies in the labour market and matching unemployed labour to potential jobs, the Sunshine Project has significant focus on training and matching people to jobs. It is necessary for the government to undertake policy intervention to facilitate the social, population and vocational adjustments consequential to industrialisation, urbanisation and changing agricultural practices and organisation. In addition to helping in a redistribution of labour, there was in the PRC significant demand on increasing the knowledge and skill base of workers, to take best advantage of industrial expansion and construction. In order to bring about the development of knowledge and skill bases of workers, the Sunshine Project is firmly located in Technical Vocational Education and Training (TVET) approaches.

The Sunshine Project is grounded in philosophical and policy positions, and to put the policy into practice, the six government ministries responsible for the project developed a National Migrant Worker Training Plan (Shaohua 2005). This plan used two phases built around the major focus and approaches of the project. Each phase reflected a different focus in terms of numbers to be trained, although the main activities were preemployment training for farmers planning or wishing to go to nonagricultural industries, explicit vocational training linked to work ready skills that were in demand and on-the-job training. The training activities were closely linked with skills and jobs that the labour markets were indicating were needed, and so there were attempts at having a strong match and link between the supply and demand of skills. This approach is also an employment-orientated approach, in that it is focused on providing people with the skill sets necessary to be able to get a job. This also recognised the importance

of skill upgrade and addressing new workplace skills, as well as the necessity to facilitate worker migration.

Implementing this project across thousands of communities and coordinating the activities of six ministries were no easy task. It required high level of collaboration at various levels of government and across communities. While many activities were operating concurrently across multiple communities, the approach was strategic and focused and required distinct steps in action. In particular, it was necessary to access current and accurate figures on unemployment in various communities and under employment in various industries and to strategically match these taking into account the skill of education base of the workers and the skills required of the work.

The government's role in planning and implementing the programme was to act as a facilitator and an enabler. In this, the PRC government committed significant funds in order to operate new and expanded programmes and also to provide training incentives. The government did not actually do any of the training or other on the ground activities, but rather, identified need, identified potential partners and providers and provided the money needed at each step and for each process. Existing and upgraded training institutions, public and private, undertook the training. These training institutions needed to pass quality checks to ensure they had capacity, resources and appropriately trained and qualified staff to undertake the training activities.

The Sunshine Project Implementation

Under the work plan, the project there was a focus on key issues each year from 2004 to 2010. In 2004, the focus was on rural labour transferred to nonagricultural industries, providing skilled labour for major grain-producing areas in the PRC, generating employment in poverty-stricken areas and short-term prevocational training programmes. In 2005, project activity increased, and a distinct need focus based on regions (eastern, central and western regions) was taken in the provision of training subsidies. In 2006, funding for subsidies was increased, and new programmes were rolled out to assist farmers in finding new jobs and assist in their transfer to these. There was also a focus on improving quality of project activities. In 2007, it was decided to extend training periods to allow more time to cover skills at the depth required. Also, new programmes were introduced focused on skill upgrade and entrepreneurial and business skills. In 2008, additional programmes were rolled out, with a continued focus on longer, in-depth and quality training. In 2009, activities across all sub-programmes of the project continued; however, there was an increased focus on agricultural-related industries following significant improvements in agricultural practice and in the use of technology in agriculture. This focus continued into 2010 picking up on other rural service industries and rural support industries. Therefore, the Sunshine Project is not just about assisting in the transfer of populations from rural to urban but also

significantly about helping rural farmers come to grips with and be qualified for work in a modernised agricultural economy.

One feature of the project has been the provision of various employment support and service activity. For example, in 2006 in Hubei Province, an initiative was set up to offer information to rural workers and to bring workers in contact with industry representatives through facilitating labour fairs. Over 100 labour fairs were held in 2006 offering more than 300,000 jobs. The fairs brought together labourers and employers allowing for skill matching to take place. However, it was recognised that the process is not just a matter of matching people to jobs, but is also about empowering workers through better understanding of workers' rights. To help inform workers of their rights and to offer support in cases of abuse, numerous legal aid centres for migrant workers were established.

In the implementation of the project, a decision was made to separate the administration of activities from the actual training and activities themselves. Training providers, legal aid centres, employment agencies and other groups involved in on the ground implementation by and large did not have to worry about the funding processes, but could concentrate on what they were contract to do.

Quality control was ensured through a number of mechanisms. As mentioned, training providers and training centres needed to obtain accreditation before they could access funds and provide training. These quality requirements were monitored throughout the project. Likewise, training providers had to guarantee the length, content, skills and quality of their training programmes. In particular, they had to demonstrate that their training programmes linked to the goals that had been set. Training programmes very often were linked to formal qualifications, which have contributed to the further development of the PRC's qualifications framework. Additionally, such formal recognition provided incentives to farmers to undertake training and provides a mechanism for employers to recognise skill sets as defined by the qualification.

The Sunshine Project has involved literally hundreds of subprojects since its inception covering a broad range of training and other activities. What follows is a description and analysis of two projects.

Retraining of Rural Workers for Changed Rural Industry

As indicated above, the rapid transition of the PRC towards a market economy in recent years and the modernisation of agricultural industries, resulting in more efficient agriculture requiring less per capita labour per output, have created an enormous surplus of rural workers. As a result, the Sunshine Project has paid particular attention to creating mechanisms for the relocation of rural workers to nonagricultural industries in urban areas. However, the PRC government recognises it is equally important to develop skills and knowledge of some rural workers for work in agricultural industries and agricultural support industries in order to harness the full potential of a modernised and multifaceted agricultural sector (Nuo and Ligang 2012).

In order to achieve a highly productive and efficient rural sector, strategies need to be focused and applied at the local or industry level. Following this approach, the municipal government of Wuhan with the help of the Sunshine Program's platform for entrepreneurial training undertook steps in the form of preferential policies and training practices focused on agricultural industry. One example of this addressed policies and practices in the pork industry of the province through farmer entrepreneurial training in the Wuhan Sunshine Program (Li 2012a).

The pig industry has been one of the remarkable miracles of modern agriculture. Traditional pig farming involved smallholders raising a few sows in open fields, with limited shelter and depending upon available food often with low protein content. The consequences were low efficiencies in the conversion of food into meat and high labour demands. Contrasting with this is modern pig farming where decades of genetic breeding have resulted in pigs that mature rapidly and that are extremely efficient in food conversion ratios and with sows that have large uniform litters. Coupled with this are intensive pig-farming practices with environmentally controlled restricted exercise habitats, formulated high-protein food that is constantly available, the use of antibiotics and other approaches to reduce mortality and increase metabolic efficiency. Pigs, along with poultry, have become high-tech agricultural activity, which can be managed using technology to minimise labour input. In the PRC the pig husbandry approaches have changed in many locations from the traditional methods and practices based on single farmer households to industrialise large-scale operations. In order to be able to engage in such large-scale high-tech operations entrepreneurs need capital for development of local capacity and high-level managerial and technical expertise. In addition, labour to operate such high-tech contemporary piggeries requires matching skills and training that goes beyond that required in traditional pig-farming practices, where typically skills were passed down from father to son and mother to daughter. Increasingly as well, pig-farming enterprise needs to not only use the latest technology, but to do so within a low-carbon ecological deeply rooted in the local context.

The Wuhan's Sunshine farm enterprise training programme was extended in the form of an entrepreneurial training programme at the Agricultural School of Wuhan focused on pig husbandry. The programme was run over 15 days by teachers and experts from the university and was provided free of charge. This concentrated training course involved entrepreneurial design, market research, application of modern pig-raising methods through practical learning tasks and business development. In addition to the agricultural training that farmers and labourers received, there was assistance provided to farmers through various agencies in accessing credit for capital development and also to establish networks for ongoing field extension support by agricultural offices.

One of the outcomes of this programme was the regeneration of old farms, which were renovated, and facilities improved. In some cases, value adding occurred through construction of piggeries with recycling of waste into biogas power-generation facilities at the piggery creating an integrated system for the use of biogas slurry and residues and providing some power back to the piggery operation.

The pig-raising programme was initially provided to 97 people from the districts of Huangpi, Jiangxia and Caidian, including farmer households specialising in raising pigs and farmers willing to raise pigs. The implementation of the programme involved ten experts and professors from the university who successfully delivered lectures concerning practices for farmers to start their own business and the application of new technologies for standardised ecological pig-raising enterprise. The training contained a mix of theory and practice and also included field trips to pig farms and practical experience in a range of operations. The programme cultivated among the participants entrepreneurial consciousness, inspired them to start their own businesses and taught them methods to start new business ventures. In addition, close liaison between the farmers, local agricultural extension officers and university teachers ensured a common focus and built a supportive network, which has helped to sustain ongoing enterprise activity.

One of the impacts of this project has resulted in noteworthy increases in farmers' income, and this is in line with impacts of other Sunshine subprojects and is one of the key goals of the policy driving the Sunshine Project. Also, the entrepreneurial training encouraged farmers to create their own business ventures. This specific training has the long-term potential of generating additional positive benefits such as job creation and increased employment. These effects can contribute to a generalised improvement of prosperity in rural areas and to the generation of a virtuous cycle to pull rural workers out of poverty.

Training Rural Labour for Urban Industrial Activity

The PRC's economic development has been fuelled by the growth of its market economy and has led to rapid industrialisation and increased urbanisation. While the rural population of the PRC is still very large, it has shifted from being the majority of people to where more people now live in urban communities than in rural communities. The significant shift in population coupled with major shifts in industrialisation and work practices has resulted in misalignments of labour markets. The rapid urbanisation processes associated with these population changes present potential problems of social disharmony and economic disparity if adjustments that allow for a smooth absorption of the excess rural labour force into the urban market structures are not made.

However, it is not desirable to simply transfer excess rural labourers, with skills in rural industries and lifestyle, into urban settings and vocations where different skills are required. The successful transfer of excess rural labour to take up new roles requires different sets of skills, and the transferring rural labourers need information to best access and harness job opportunities. Only when rural labourers are provided with the skills and information that they need can they fully and effectively participate and prosper within the developing urban economic and social structures.

Given these challenges, systematic 'bridges' are required to facilitate rural workers in obtaining jobs in urban areas and to facilitate their and their family's migration. A sub-programme of the Sunshine Program in Yunxi County (north-western Hubei Province) represents a success story in assisting excess rural workers effectively take up employment opportunities in urban settings. The programme aimed at establishing a smooth connection between rural workers, who were previously farmers, and companies operating various manufacturing enterprise in urban settings who are in need of workers. The sub-programme focused on identifying employment opportunities and then identifying the skill set needed in order to meet the required job skills. In identifying the skill sets required for employment the sub-programme focused on strengthening linkages between five major vocational training schools and factories in order to best facilitate the development of appropriate and focused vocational skills that the migrant workers needed in order to be skilled factory workers.

In this process, the Sunshine Program provided tangible support to assist vocational schools to meet industry training needs by matching vocational schools and their specialty training programmes with the companies' needs. The process was focused on ensuring that these potential employees could be successfully matched with companies with employment needs and that these migrant workers could find a job as soon as they finished their training. In addition to funding provided by the Sunshine Project, Yunxi County spent over two million Yuan (US$320,000) towards the training of these prospective migrant workers. The county took on an important role in caring for and facilitating training and employment opportunities for its own citizens. A county-based training system linking these five major training centres for increased efficiency was also established in order to provide the appropriate training and best guarantee employment in urban areas of surplus rural labour in the county.

The Sunshine Project subproject in Yunxi County has had significant impact and success. It provides a useful model in connecting schools and industrial employers to ensure most effective matching of vocational skill needs and the training required to achieve these. Additionally, it demonstrates the effectiveness of bringing representatives of industry, located in urban settings, into a rural community in order to liaise directly with training facilities and to establish mechanisms for recruitment. As a result of this activity, the five main county vocational and technical schools set up partnerships and agreements with the Shenzhen Foxconn Electronics Group, the Hubei Zhuoyue Construction Group and the Dongfeng Motor Corporation for migrant worker employment and the skills required for this. These partnership agreements not only facilitated linkages for employment but also indicated the training required. These industries were able to negotiate with the training schools to ensure that the particular skills they required for the industries were addressed.

Additionally, skilled technicians from these companies assisted the vocational schools to develop appropriate curriculum and training resources. The training therefore became quite focused on ensuring that these rural workers were job ready for these industries and, therefore, readily employable. For example, between

2005 and 2006, approximately 7,430 technicians undertook training through these county vocational schools in collaboration with companies mentioned above and were successfully employed in positions that paid significantly more than they are able to achieve in the past (PRC Government 2012).

Ten specialised courses were developed, and these included cooking, electronic assembly, electrical engineering and construction. These training programmes not only reflected the needs of companies that had established partnership agreements but also linked to national qualifications frameworks and national and international standards. The standard of training delivered was of a high quality, and these excess rural labourers were highly motivated to be successful because successful completion of training nearly always guaranteed employment. Consequently, some of the areas of skills development achieved in this programme have received national recognition, and this sub-programme that was set up to meet a local need has resulted in graduates being transformed from displaced rural labourers into well-known and respected expert workers. For instance, 'Yunxi construction workers' that emerged from this programme have a reputation across the PRC as being the leaders in the field.

Graduates of this sub-programme experienced a substantial increase in income levels upon employment and a widening of employment perspectives and opportunities. This success has been mainly due to the adoption of a multiparty approach that tailored both training and placement opportunities to the participants' characteristics and expectations.

Rural Transformation and the Sunshine Project

The concept of rural transformation can have multiple meanings. It has been used to describe a vision and process of change for the development of rural communities through education focused on national and global developmental goals (INRULED 2001). Such vision often emphasises poverty alleviation and national and community development goals. This view was strengthened somewhat in a recent publication where the authors elaborate that rural transformation '. . . is all about seeking to bring about improvement in the living conditions of **the** farmer, **the** artisan, **the** tenant and **the** landless in the countryside' [our emphasis] (Ahmed et al. 2012). The concept of rural development is closely linked to the ways in which the term rural transformation is used in a range of literature. However, some have argued that any aspect of rural transformation needs to go beyond the physical transformation of rural environments and incorporate transformations of people. Shaw (2011) makes this point and links processes of education and training, which are focused on the person, directly to transformational outcomes which impact the person as well as the community.

The Sunshine Project has as a primary goal the redistribution of labour from an agrarian economy into an industrialised economy and to facilitate the skills development required for migrant workers to be able to take up jobs in the PRC's new

economy. The Sunshine Project is also about facilitating a smooth migration processes with minimal social disruption. Such migration in the long term is tending towards increased congregation of people in urban communities. That is, rural people are migrating to urban centres in order to work and in the long term to live. However, as indicated previously in this chapter, a significant number of rural migrant workers also constitute a floating population of several hundred millions of people, commuting annually to and from workplaces in distant urban centres. The outcome of the Sunshine Project as a mechanism to facilitate social adjustment to changing social and economic circumstances and to industry requirements has significant other 'transformational' outcomes. As noted, these migrant rural workers have the capacity to earn incomes that are substantially more than what they would receive if they had remained in (or had the opportunity to remain in) their traditional employment vocations. Thus, increased incomes, much of which is sent back 'home' has a direct impact on improving the lives and lifestyles of people living in rural communities. The PRC is experiencing a significant home-grown consumer-led economic boom. Salaries have been rising steadily over the last decade, and standards of living have increased significantly. The PRC is the world's largest consumer society, and substantial improvements to lifestyle through improved housing, communications, entertainment, recreation, health services and other 'consumables' have been achieved in recent years.

Additionally, and very significantly, the Sunshine Project has a direct impact on improving the education of Chinese people. Much of these educational activities are focused on skills development (Ahmed et al. 2012), but the development of skills also requires and involves other educational outcomes. Migrant workers for vocational occupations in industrial settings often need high-level contemporary skills such as skills required in the modern construction industries, electronics industries, manufacturing, management and skills for service industries such as tourism and hospitality. When people undertake education and training, they often have a transformational experience (Mezirow 1991; Newman 1994; Reading et al. 2006; Shaw 2011, 2012). In the case of migrant workers undertaking training under the Sunshine Project, these transformational experiences can be various, but include having a new perspective on work and a deeper understanding of theoretical underpinnings of practice. That is, they better understand how things work. Other transformations may be more related to paradigm shifts where people start to view the world and their values in completely different ways. However, when training is coupled with new work experiences in new contexts (i.e. urban or increasingly urbanised rural contexts), this can lead to additional transformative experiences. Finally, education, particularly vocationally orientated, can have an empowering outcome as was demonstrated and used by Freire (1972). People are transformed when they gain skills and knowledge and are able to apply these in their daily lives. When people have skills and knowledge, they are in a better position to actually do something about changing their own lives, to make vocational choices, including entrepreneurial activity.

Such a view of transformation is important. The significant vicissitudes taking place in the PRC, from an agrarian economy to an economy dominated by

manufacturing and construction, and from a rural society to an urban society, are changing the very fabric of Chinese society. Some of these changes have come about through other policy decisions as well or through processes of opening up and modernisation. No matter what the driving forces, the PRC is undertaking change. Indeed, the whole society is transforming. However, in this process, through education, work and through political reforms, individual people are changing and being transformed at the personal, family and community levels. As people transform in response to societal changes, they also are in a better position to transform their society. As rural people become more empowered through knowledge and skills, and through income earning opportunities, they will be and are in a stronger position to take an active role in the directions that the transformations of their lives and communities take.

Conclusion

The Sunshine Project is described as the world's largest project for rural labour transfer training (Li 2012b). It was set up through various policy initiatives to facilitate a process of structural adjustment of labour markets and habitation in the PRC. This structural adjustment is required in order to ensure unemployed or underemployed rural labourers have an opportunity to secure paid livelihood in the rapidly developing industrial, construction and service industries of the PRC. The project is focused on facilitating matches within the job market and providing pathways for training and migration for millions of rural PRC workers. The Project is essential for PRC ongoing development strategies as it enables efficiencies essential for successful further development of the PRC's economy. However, as the PRC continues to develop and undertakes massive adjustments to industries, there are substantial pressures on people, communities and the environment. These changes are sometimes referred to as 'transformational', in the sense that people, communities and environments are being radically changed. Some of these changes are unavoidable and indeed desirable, whereas others generate tensions within the fabric of society and also have significant environmental impacts. This chapter has only addressed some of these changes and issues focused on rural labour training for undertaking employment within various industries in urban contexts, the retraining of rural labourers to take advantage of the latest agricultural technologies for re-employment in rural contexts, and has to some extent addressed some of the issues to do with population adjustments and internal migrations in the PRC.

In highlighting some of the outcomes of the Sunshine Project, we have indicated that the education and training activities conducted under the Project not only have important impacts on matching workers with skills with employment but that also education and training can have a positive transformational outcome for the individuals undertaking these. We further highlight that individuals transformed by education and training and employment opportunities can have a transformational impact on their families, communities and ultimately on the nation.

The Sunshine Project continues to receive support from the highest level of the PRC government and has become a key policy activity area impacting broadly across the PRC and most industries and has made a substantial contribution to the continuing ongoing development and stability in the PRC, and that benefits the whole world. Fundamental to the Sunshine Project is a focus on the person, on their livelihoods and well-being and on raising income levels and alleviating poverty and helping people live fulfilled lives. In this respect, the project is clearly successful.

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Chapter 6
TVET and ICT Acquisition Process

Tapio Varis

The terms 'information society' and 'knowledge society' do not reflect any more the essence of the modern society which, through the increasing use of the social media and networking, is becoming more and more social and communitarian. This trend is global in nature.

The development from the knowledge society to social society is accelerating. We find daily new ways to find and create new or updated information. These new mind-expanding methods, tools and ways of collaboration are demanding us to change and develop the educational traditions. The computing is getting more and more part of the daily life outside the school. Social networks, cloud computing and connectivity are the keywords of today. The young generation is very familiar to create, collaborate and communicate in the Internet. These are the skills needed also in the industrial and business life.

The major change in approaching the ICT skills acquisition process today is that learning – especially by the utilisation of enabling technology – instead of separating ICT training to institutions and curriculum, it can be seen as permanent part of work and lifelong learning. Since the learning and work environment is constantly changing, the need of ICT support personnel is vital.

Today, vocational education plays a crucial role in the social and economic development of a nation. The emphasis on specific objectives and tasks, however, varies from country to country. Accordingly, the organisation and administration of vocational education is based on different models. It can be incorporated at the secondary or post-secondary level, and it can be combined with an apprenticeship or be followed up with further training. Increasingly, vocational education can be recognised in terms of prior learning and assigned with partial academic credit towards tertiary education. The skills and competences necessary can be acquired either in workplaces or in vocational schools, and most often, a combination of both

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are used. Vocational education is usually overseen and/or regulated by the Ministry of Education, the Ministry of Labour, or by relevant sectoral ministries.

Managing work in which responsibilities have been distributed to a high degree is a major challenge. The communication between employees and their managers may be based only on virtual contacts. In short-term assignments and in mobile work, it is difficult to update and upgrade one's competences. This would, however, be crucial to the future employability of knowledge workers. On the other hand, it is difficult for managers to support continuous learning of individual employees and to emphasise shared learning of all employees in the network of a team or an organisation. There is a growing need for flexible structures and practices that facilitate lifelong learning (Varis 2011).

Learning at work and Web-based social software have an increasingly important role in competence development. The requirements of speed and possibilities of virtual work have emphasised the emergence of new business models, such as open source. Instead of strictly protecting the development work up to the launch of a product or service, the idea or project is openly discussed and collectively developed from an early stage on the Internet. Based on open source, anyone can contribute an idea or provide improvements to the project in order to benefit the total development. The development resources can thus be multiplied.

Transforming Boundaries

The current transformation also penetrates boundaries that emerged and were shaped by the forces of the previous techno-economic paradigm. One of the most important of these boundaries is the one that separated industrialised countries from developing countries. The global knowledge-based economy slices geographical regions in new ways, where national borders have decreasing relevance. Instead of geographical proximity or local availability of resources, the underlying organising principle is based on global networks.

The distinction between developing countries and developed countries is therefore becoming increasingly misleading. This change can now readily be seen, for example, in countries such as the Republic of Korea, India and the People's Republic of China (PRC), where regional hubs connect with global production networks. A similar reorganisation can also be seen in the leading industrialised countries, where geographic specialisation is now essentially based on diversification in the context of global systems of production.

ICT literacy and numeracy are vital for TVET. The health and safety of workers often depend upon their ability to read instructions (e.g. on fertiliser bags) and to make accurate calculations (e.g. of mixing ratios and application levels). The wider skills of scientific and social literacy are also important, for example, for equipment maintenance and repair, understanding technological change (scientific literacy), group work, dialogue and negotiation with colleagues and supervisors, gender and ethnic tolerance and other skills needed to build harmonious relations in the

workplace (social literacy). The application of such literacies to the world of work and active citizenship need to become core dimensions of vocational education if it is to respond to the imperatives of social sustainability.

The usage of the terms 'skills' and 'competences' is inconsistent. Skill is sometimes seen as representing only lower-order attributes (e.g. keyboard skills), but most often as including also higher-order attributes (like thinking skills). Competence is often construed as the application of skills in specific contexts, but also as synonymous with skill.

Workers face two overlapping challenges. The first is to acquire the skills necessary to enter an increasingly digital and competitive job market, and the second is to continually improve those skills and learn new ones as a part of their lifelong learning. Many studies suggest that workers around the world are not able to sustain this pace, and it is widely believed that schools are failing to keep providing employees who are adequately prepared to exploit new knowledge and skills. Considering that the first skill to be acquired in the working life is bridging information gaps, there is a wide consensus that all workers should be able to:

- Master appropriate tools to gather information
- Understand the context of that information
- Shape and distribute information in ways that make it understandable and useful
- Exchange ideas, opinions, questions and experiences

The paradigm of learning in the corporate setting is rapidly shifting from skills development to capability management. The strongest factors driving this change are the ever-increasing need for faster innovation cycles and for abilities to support a strategic competence renewal. The current learning paradigm can be expressed as the 70-20-10 formula of learning:

- 70% of workers' capabilities are built through on-the-job development and real-life experiences.
- 20% are built through coaching, assessments and increased self-awareness.
- 10% are acquired through structured learning deliveries, such as instructor-led trainings and e-Learning.

Learners will soon realise that, once they adopt this formula, each day will be a learning day (Salminen 2005). The need to separately plan times for learning and for work will disappear; learning will be incorporated into the daily work routine. Basically, what this formula requires is developing the right mindset for learning rather than making choices between learning events and modes of delivery. There will always be room for skills-based competency development. Certain enabling skills will continue to be delivered in a classroom, not to mention those that are acquired via interactive leadership development, where discussions and networking play a major role. In a similar fashion, e-Learning is here to stay as an easily scalable and cost-efficient delivery channel for theoretical solutions.

As a new working culture emphasises the importance of lifelong learning, corporations are beginning to provide workers with means to customise and direct their own learning experiences. There is still a long road to travel in terms of improving employment opportunities for individuals and expanding the innovative

capabilities of companies; however, workers, employers and trainers are all becoming more responsible in trying to ensure the continuous development of the knowledge and skills acquired.

The traditional focus of vocational education on skills needed for manual work is being challenged by the mixture of competencies required in the workplace today. Many traditional forms of work are undergoing major changes, and as a result the division between manual and mental work is vanishing. Sustainable vocational education should concern and affect both manual and mental competencies.

New Pattern of in Service Training

The teachers in service training in ICT have been in many cases pumping the info and the skills to teachers' memory. The scope has been to train the teachers to be experts on software skills or methods. The problem has been that the teachers cannot attend the training continually. There can be gaps of years between one teacher's in-service training sessions:

- Traditionally defined courseware is not an effective e-Learning strategy
- E-Learning ware is more related to pedagogy than an actual product
- It emphasises computer-mediated communication and is student centred
- Teacher's/trainer's responsibility of the learning process
- Discussion groups, chat, blogs, wikis, webinars
- Tools available through open source
- Demand for students' self-directness

Smart Training for the Smart Society

The problem of teachers' in-service training has always been the shortage of training time. The short training courses are fulfilled content, which the teachers then try to implement to their work. But too much is too much. The paradigm of teachers' in-service training has three main components. Firstly, teachers need to learn the virtual learning skills, and, secondly, the training has very small chunks, which the teachers can try out at their work right after the training session.

The third component is to share the experience by teachers instructions, narrative stories of the processes or by cross evaluations of the results of the experiences. The training model contains six training sessions. The first three 2–4 h sessions are face-to-face sessions. On these sessions, the basic skills of new pedagogies, the new learning environments and social media skills are trained. Each face-to-face (f2) training has three components:

- Basic training of the skills
- Ideas how to use learned skills to teachers' own curriculum (daily work)
- Personal implementation plan of one new learning method

Each f2f training session has cross evaluation and experience sharing part, when all the good and bad experiences of the try-outs will be shared. This is a powerful method because humans learn from mistakes, so to make a mistake is a gift.

On the first phase of the training, the virtual meeting room is presented, practised and learned. The second phase of the training jumps in the Internet. That means no travelling any more but participating to the trainings in the virtual meeting room. The next three sessions will contain and concentrate on the activation models of the learners and the concrete outcomes of the learners, which the teachers then can use in their evaluation process. These sessions are kept in the virtual meeting room and will be recorded. The recordings can then be used afterwards, for example, hands-on manuals. The trainees are also encouraged to create short instructions to learners and colleagues.

During the second phase of training, the trainees will also plan a peer training plan for their 5–10 colleagues. These plans are cross evaluated by the trainees and then executed by each trainee in their own school. These experiences will also been documented to support the training processes.

The third phase of the training process is to train the colleagues. For each trained trainer, there will be one group of 5–10 trainees. The training itself contains three sessions. The sessions are short 2–4 h.

In the first session, the trainer presents her/his case study, which were done in the training. With this example of practical experience, the trainees will then start to plan how to implement similar skills to their own class or personal curriculum. Also the virtual meeting room is presented and explored.

The second session is for cross evaluation of the plans. In the session, all the trainees will present their plans and discuss and develop them for the practical experience. The virtual meeting room skills are strengthened. After the second session, the trainees will execute a pilot of their plan in the real classroom work. After the pilot, the trainees will write a short report as a teachers guide for colleagues.

The third session will happen in the virtual meeting room, where all the trainees will participate and present their experiences from the pilot. Sharing the experiences and good practices, the training will continue. The key idea is that the trainees will commit themselves to the training process for at least 2 years or, for example, in four training sessions.

After the basic training, the trainers and trainees can take the next level of the courses together supporting each other. The next level trainings include different subjects and disciplines pedagogical, didactical and ICT practices.

This model has been developed in the Central Finland region and has spread all over the country. The model is very simple to localise and implement in different teaching and learning cultures and all the curriculums.

In brief, the evolution of *ICT literacy* in different regions has developed in the following stages:

Stage 1: Building access and connectivity

Stage 2: Introducing basic Internet use as well as more sophisticated and sustainable digital competences

Stage 3: Developing trust, confidence and multiplatform use. Using social media for problem-solving, cooperation and community building

The world of work is facing similar challenges everywhere on the globe. New possibilities of using ICTs in education and training will improve workers' chances to get vocational qualifications. The development of the educational structure will also bring changes: the need of face-to-face training can be reduced, the training material can be reused numerous times and it can also be updated easily. Formal vocational education is becoming more integrated into everyday working life. Vocational qualifications are nowadays increasingly measured by competence tests. Also, competence-based qualifications have a great role in the in-service training of employees.

Recent trends in ICTs and TVET put emphasis on the innovation strategy for education and training. Attention is given to skills and needs used by modern firms, working population, and also in arts and science education. In TVET, there is a tendency to highlight the 'learning by doing' approach. Today, managing work in which responsibilities have been distributed to a high degree among the network of workers is a major challenge. Communication between employees and their managers may be based only on virtual contacts. As a consequence, the demand for TVET is increasing, and education and learning are adopting new forms. The challenges of vocational education are quite similar in countries that vary widely in their current economic level of development. Entrepreneurship, which is closely connected with ICTs, is a very important factor in both the global and local economies.

The nature of TVET in the emerging global social and communitarian society can be classified in knowledge work, service work and technical work. New skills and competences in different fields can be acquired both in small modules and lifelong learning environments by using open educational resources (OER) and through cooperation with the industry and SMMEs. Instead of being limited to traditional testing, skills can be evaluated through product demonstrations and performances.

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Part II
Skills Development: Emerging Issues and Strategies

Chapter 7
From TVET to Workforce Development

Robin Shreeve, Jennifer Gibb, and Shayla Ribeiro

Introduction

Australia was fortunate that the impact of the 2008 Global Financial Crisis was less severe than in most other developed economies. Recovery was aided by a resources boom based on exports of coal, iron ore and other commodities to the rapidly developing economies of India and the People's Republic of China (PRC). This boom is, however, having negative impacts on sectors like manufacturing and tourism because of the increasing strength of the Australian dollar. The boom is also often blamed for skill shortages in occupations like electrician and civil engineer that are in strong demand in the vibrant resources sector.

Key Points.

- To maximise the returns from the large investment in skills and tertiary qualifications, it is not sufficient to concentrate solely on the supply of skills. Priority also needs to be placed on employer demand and emphasising better utilisation of skills.

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(continued)

- The Australian TAFE sector evolved to fulfil two main roles – technical and off-the-job training for apprentices and older workers and offering second chance education to adults.
- Reforms to TAFE over the last two decades have focused on making VET more industry led, competency based along with opening the market to a more diverse range of providers. This has brought challenges in terms of quality and regulation.
- 20% of the Australian Labour Force aged 15–64 were engaged in formal study leading to a recognised qualification in 2011.
- People with a post-school qualification at Certificate 3 or above are less likely to be unemployed and people with higher qualifications earn more.
- Moving away from funding providers to funding the users requires good public information about the labour market and the performance of individual providers. It also requires effective regulation and quality assurance of the training delivery.
- Planning for workforce development is about giving users the tools to respond to changes in the labour market rather than predicting in detail what those changes might be.
- Skills Australia's next National Workforce Strategy will be based on scenarios that describe plausible futures for Australia to 2025 and economic modelling of industry structure, labour market demand and skills supply.
- Skills utilisation is as important to workforce development as skills acquisition and the key critical success factors to achieving better use of skills include good leadership, supportive culture, communication, consultation, participative processes and commitment to harnessing and nurturing the talents and skills of the workforce.

Concentrating on the Supply Side Is Not Enough

Like most OECD countries, Australian Governments have for many years encouraged public and private investment in both higher education (HE) and skills as a means of achieving greater national prosperity (Australian Government 2012; Finn 1991; Leitch Review of Skills 2005, 2006). There is a well-established link between increases in post-school qualifications and improvements in workforce participation and labour productivity both of which have significant returns to national accounts (Productivity Commission 2012, p. 43). Until recently, efforts have largely concentrated on increasing the supply of skills whilst, at the same time, reforming the way the supply side is organised. Though the demand side has not been totally neglected, it has received less attention from policy makers. In Australia, this is changing. Concentrating on the supply of skills is seen as a

necessary but not sufficient condition to maximise the returns from the large investment in skills and tertiary qualifications made by governments, enterprises and individuals. Encouraging employer demand for skills and an emphasis on achieving better utilisation of skills in the workplace are now priorities for Skills Australia, the statutory body established in 2008 to provide independent advice to the Australian Government on Australia's future workforce development and skills needs. In July 2012, Skills Australia will become the Australian Workforce and Productivity Agency to reflect some of these changes.

A Workforce Development Approach Is Needed

These new policy directions are part of a shift to what has been termed as a 'workforce development' approach. Workforce development is defined by Skills Australia as

> Those policies and practices which support people to participate effectively in the workforce and to develop and apply skills in a workplace context, where learning translates into positive outcomes for enterprises, the wider community and for individuals throughout their working lives (Skills Australia 2010, p. 7).

The workforce development agenda encompasses all of the factors that encourage the development of skills and their use in Australian workplaces and drives participation and productivity improvements. Such a broader approach presents challenges for policy makers. Whilst it is relatively straightforward for governments to increase skills supply by such direct interventions as funding training programmes and establishing training institutions, it is more difficult for governments and peak bodies to influence behaviours and practices within organisations. For example, better utilisation of skills often involves changing job roles and organisational design as well as approaches to leadership and management within the firm. In a democratic, market-based economy, it would be quite wrong and practically impossible to mandate or legislate how companies should run their businesses. Rather changes as to how skills can be better utilised in the workforce can be achieved more indirectly by incentivising good practice and through information and awareness campaigns that emphasise benefits such as improved profitability, productivity and staff morale.

Growth and Reform of the Supply Side in Australia

A well-educated and skilled population is seen as a core competitive advantage in an increasing globalised world economy. Higher overall skill levels across the population give a country the ability to produce more efficiently higher value products and services and thus compete with other counties on factors other than the price of labour. The rewards from this competitive economic advantage trickle down into the population through higher wages and higher tax income that can be spent on infrastructure as well as community building and welfare services.

People with post-school qualifications have lower rates of unemployment than people who do not (National Centre for Vocational Education Research (NCVER) 2009, p. 22). The benefits of higher levels of skills and qualifications are thus social as well as economic.

The Last 50 Years Have Seen Major Change in the Technical and Further Education System in Australia

In terms of Technical and Vocational Education and Training or TVET (which, in Australia, is generally referred to as Vocational Education and Training (VET)), this process began in Australia in a formal way in the 1890s with the establishment of institutions such as Sydney Technical College. It is hardly surprising that in the pre-Federation colonial states of Victoria and New South Wales, these early technical colleges and institutes would be modelled on those found in Victorian Britain (Cobb 2000). In these colleges predominantly younger students studied trade subjects such as boot making, wool classing and carpentry as well as every variety of engineering. Female students were severely under-represented and those that did participate tended to be enrolled in disciplines such as domestic science and what we now term fashion but, in those days, was often thought of as dressmaking or women's handicrafts. Whatever their gender, the vast majority of students were part-time with many attending in the evening after a day at work. Interestingly, courses that prepared young ladies for office careers were taught in private institutions such as Williams Business College.

Much has changed over the past 120 years. But the speed of change has increased significantly in the last 50. A major national review led by Myer Kangan was published in 1974. This expanded the technical colleges' role from just Technical to Technical and Further Education (TAFE). Large amounts of Commonwealth government money were injected into the TAFE colleges that now became part of a national system. Previously, technical colleges were solely funded by their owners, state governments. Whilst this ownership relationship continues, the public funding of VET today is a shared responsibility between state and commonwealth governments. The Commonwealth now provides around 25% of funding, the states around 50% with a further 25% per cent coming from student fees and industry contributions. This adds some complexity to managing the system and is in marked contrast to the Higher Education (University) Sector where generally states provide little funding. Universities are funded largely by the Commonwealth government as well as student fees which are collected through an income contingent loan scheme called the Higher Education Contribution Scheme (HECS). University students pay their tuition fee loans back through the tax system when they reach a certain earnings threshold.

Expanding the Role of TAFE to Include 'Second Chance' Education

The Kangan inspired reforms of the 1970s were deemed to be significant enough for TAFE to be classified as an educational sector in its own right alongside the other sectors of primary, secondary and higher education. The new TAFE sector not only did the 'off-the-job' training for apprentices but now also delivered 'second chance' programmes for men and women and expanded its reach into areas such as numeracy and literacy. Notions of 'access and equity' for learners who had previously missed out on a successful educational experience were central to the mission of the new TAFE. The outputs of these programmes undoubtedly contributed to greater workforce participation by equipping unemployed adults with the basic skills needed to gain employment.

If the 1970s emphasised the individual learner as client, the 1990s were about reshaping the TAFE sector to be more industry led (Australian National Training Authority (ANTA) 2003). The major reforms to achieve this in this period included the establishment of the Australian National Training Authority (ANTA), an industry based statutory authority, along with a move to a competency-based system of training supported by a national qualifications system (the Australian Qualifications Framework (AQF)) and a national quality training framework (the Australian Quality Training Framework (AQTF)) which set the standards for training providers to become registered training providers. These standards, however, were implemented by different state-based bodies across the Commonwealth. The sector was opened up to competition from private training providers so TAFE became redefined as the 'brand' of the public provider within a broader sector called Vocational Education and Training (VET).

The Training System Offers an Expanded Range of Qualifications

'Industry led' meant that training was delivered to achieve occupational competencies defined by bodies known today as Industry Skills Councils (ISCs). ISCs are managed by boards of directors representing employers and trade unions. Different levels of competences were aggregated into a new qualification structure which ranged over four levels of certificate through Diplomas and Advanced Diplomas to Vocational Graduate Certificates and Diplomas. The competencies and associated qualifications are contained in documents known as Training Packages. Even though the Diplomas and Graduate Certificates overlapped with university level qualifications, VET sector credentials did not include degrees indicating a demarcation between VET and Higher Education (HE). A few

institutions like Royal Melbourne Institute of Technology (RMIT) were always 'cross sectoral' teaching both VET and HE programmes. This trend is growing with more public and private institutions becoming 'mixed sector' (Wheelahan and Moodie 2008) as they have become registered and accredited to deliver both VET and HE programmes. This development along with an emphasis on credit and articulation agreements between different qualifications has encouraged talk of a more integrated 'Tertiary Sector' covering both institutionally delivered VET and HE programmes (Wheelahan et al. 2012, p. 16). This move was further encouraged by the latest national report into Higher Education led by Professor Denise Bradley (Australian Government 2008).

A Large Number of Providers Bring Challenges in Terms of Quality and Regulation

The availability of government funds on a competitive basis has attracted many new providers into the training market. As of 2011, there were over 5,000 Registered Training Organisations (RTOs) in Australia, though the 61 public TAFE institutes still account for the largest amount of publicly funded VET. Initially competition was in essence a 'funding market' with public and private providers tendering for government funds. Gradually the sector has moved to system of 'user choice' where students and enterprises are given 'vouchers' to cash in at an institution of their choice.

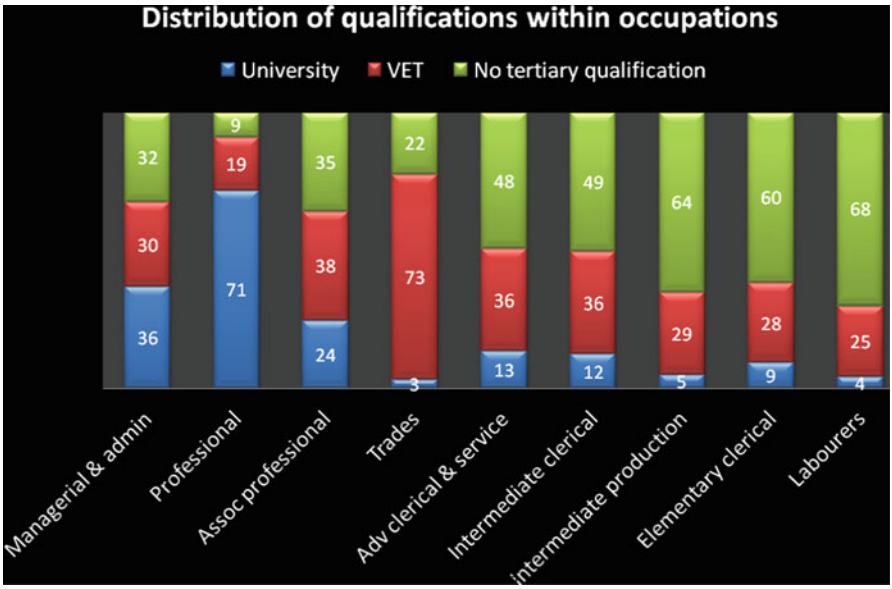
The large number of providers entering the market has presented challenges for regulation and quality. Measures to address this include the formation of a national regulator, the Australian Skills and Quality Agency (ASQA), which has replaced locally based arrangements in all states except Victoria and Western Australia. Bodies like Skills Australia have called for further measures to improve quality and consistency such as establishing a system where all providers have a sample of their student assessments externally verified (Skills Australia 2011, p. 86). Consumer information about the performance of individual RTOs is also being improved with the introduction of a *MySkills* website.

The Australian VET System Today

Today the Australian VET system is well regarded internationally with the OECD stating

> Australia has a very well developed VET system, which enjoys a high degree of confidence (Hoeckel et al. 2008, p. 5).

The system can be characterised as industry led, competency based with public funding increasingly allocated though a demand-based, user-choice mechanism.



Source: Table adapted from Richardson and Teese (2008, p. 12)

Less than 15% of publicly funded students are full-time, the largest group are those studying at the Certificate 3 (apprenticeship level), and the biggest industry areas are business, construction, engineering, hospitality and the caring occupations.

The VET system trains the majority of Australian trade workers. Universities and HE providers train most professionals. Managers, technicians and paraprofessionals are trained by both HE and VET. However, there is a long-term tendency for the training of managers and paraprofessionals to shift from VET to HE Karmel (2011). This is partly due to growing complexity in this work and partly as a result of 'credential creep'. University graduates tend to be paid more than VET graduates in Australia, so employee and professional associations have an obvious interest in shifting the credentials needed to practise from one sector to another.

Results of the Supply Side Push

The development of the supply side has led to over 1.8 enrolments in publicly funded VET programmes and 1.2 million enrolments in HE in 2010 (National Centre for Vocational Education Research (NCVER) 2012, Embargoed until 9:30 am AEST on 18 June 2012). In full-time equivalent, student terms the numbers are 655,000 in VET and 862,000 in HE which reinforces the notion that HE is more of a full-time study occupation than VET. The Australian Bureau of Statistics (ABS)

Survey of Education and Work for 2011 reveals 20% of the Australian Labour Force aged 15–64 were engaged in formal study leading to a recognised qualification.

As a result, over the past decade, the proportion of people aged 15–64 years with a nonschool qualification increased from 47% (2001) to 57% (2011). Over this same period, the proportion of people with a bachelor's degree or above increased from 17% (2001) to 24% (2011) (ABS 2011).

Yet Australian Governments have decided that these levels of participation and qualification completion rates are still not enough. The Council of Australian Governments (COAG), consisting of federal, state and territory governments has set aspirational long-term skills targets to (COAG 2009, p. 37):

- Halve the proportion of Australians aged 20–64 years without qualifications at Certificate III level and above between 2009 and 2020. In 2009, there were 47.1% of Australians without a qualification at these levels.
- Double the number of higher VET qualification completions (diploma and advanced diploma) between 2009 and 2020. This would mean completions at this level would need to rise from 48,000 to 96,000.

In addition, the Bradley Review put forward targets for increases in Higher Education qualifications:

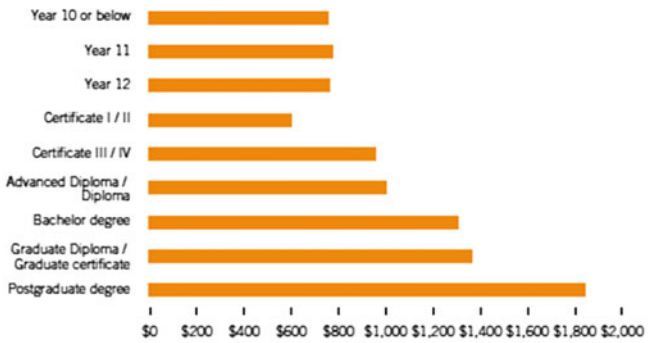
- By 2025, 40% of 25–34 year olds will achieve at least a bachelor level qualification.
- By 2020, 20% of undergraduate enrolments will be comprised of students from lower socio-economic groups.

Impact on Participation, Earnings and Productivity

The rationale for this investment in VET and HE are clear. Surveys by the ABS reveal that people with post-school qualifications are less likely to be unemployed than people without such qualifications. People with a post-school qualification at Certificate 3 or higher have an unemployment rate 5% lower than those who left school at Year 11 or below (see table below) (Australian Government 2012).

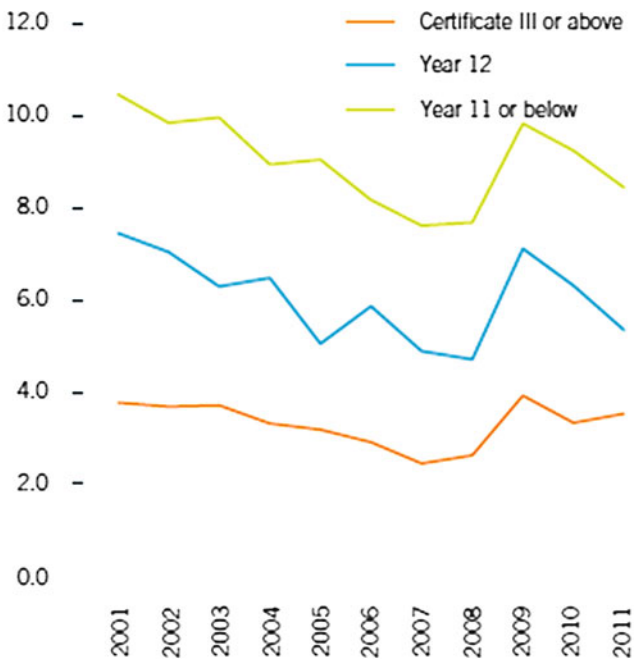
People with higher qualifications earn more.

Whilst people who possess a Certificate 3 qualification earn on average AUD $200 per week more than people who left school at Year 12 whilst the possession of a bachelor's degree increases average earnings by over AUD$500 per week (see table below). A postgraduate qualification can more than double average earnings compared to a Year 12 leaver (Australian Government 2012).



Source: ABS 6278.0 Education and training experience customised report – Employees aged 15 years and over, excluding owner managers of incorporated enterprises

Mean weekly earnings in main job by educational attainment 2009



Unemployment rate by qualification level

Gender Differences in the Labour Market Persist

These figures are averages and hide considerable variation between occupations. Students who complete an apprenticeship at Certificate 3 level in traditional male occupations such as electrician can look forward to a significant wage premium on

completion (Karmel and Mlotkowski 2010). However, whilst the completion of a Certificate 3 in child care or aged care has a benefit in obtaining and retaining employment the wage premiums are far less (Pocock et al. 2011). These are traditionally female occupations. This gender difference in the Australian labour market has led some commentators to conclude that

> . . .. . .for males two paths stand out: Year 12 followed by university study; and Year 12 followed by an apprenticeship. Apprenticeships and traineeships score well for 'satisfaction with life'. For females, the best path is Year 12 followed by university study, and this is true for those with a relatively low academic orientation as well as those with a high academic orientation (Karmel and Liu 2011, p. 13).

Those Who Benefit from Training and Learning Should Contribute to the Cost

Before exploring how to better match supply and demand and how the utilisation of skills might be improved, there is the prior question as to why Australian Government should spend over $6 billion per annum of *public* money on vocational training when many of the benefits and returns flow to individual students and individual enterprises. Should not those who benefit from the increased earnings and the increased productivity that come from training pay the majority of the costs themselves? Australia is currently enjoying a resources boom that is making mining a highly profitable activity – though the resultant high Australian dollar is having an impact on other industries such as manufacturing and tourism. Why is the Government subsidising training in these boom industries and also subsiding individuals who will also see a considerable increase in their wages and salaries?

For individuals, the rationale for public subsidies is that the high cost of unsubsidised courses would be a barrier to entry for many potential vocational learners and could result in both skill shortages and skill gaps. With enterprises, the government will only fund accredited training leading to a nationally recognised credential. The credential is probably more important to the individual employee than their existing employer in that it increases their mobility between firms. In the same vein, it is also potentially significant to the workers' next employer as the credential certifies what the potential employee can do. In this sense, the government is paying for a benefit that is partially external to the benefits that the existing employer receives directly from the training.

A Greater Emphasis on the Demand Side

Until the late 1980s, public funding for vocational training in Australia had largely been allocated to providers. Providers then recruited individual learners into a mix of programmes which the provider specified. Funding training institutions in this

way risks 'provider capture' – that is, providers push what they want to offer because of their existing staff expertise and equipment rather than deliver what customers' actually want and need.

How Australia Is Implementing a Demand-Based Approach to Funding Training

An alternative to funding providers is to fund users who then 'buy' the training they want off providers. This process goes by a variety of names including 'user choice', 'entitlement funding' and 'demand-based' funding. In other counties, but not in Australia, this process can be described as a 'voucher system'.

Demand-based funding does have some risks. It is important that users have the information available about both the labour market and individual provider performance so that they can make an informed choice. Quality and regulation need to be effective to avoid users wasting their government subsidy on poor or inadequate providers.

Demand-based funding is often implemented at the same time as a switch to funding completions rather than enrolments. Skills Australia recommended this in *Skills for prosperity: a road map for vocational education and training* (Skills Australia 2011, p. 106). Whilst some in the sector argued against this on the basis that students are more interested in acquiring skills than credentials, research by the National Centre for Vocational Education Research (NCVER) has concluded that course completions are important in terms of access to jobs and further study. Non-completors do less well in these areas. There are lesser, but still clear, benefits from completion of the whole course to those looking to upskill in their existing employment (Karmel 2012).

Funding users can also be used to change enterprise behaviours and incentivise best practice. Traditionally public funding of VET has been what the English term 'individual responsive'. That is individuals are funded to take an accredited programme at a recognised provider. Theses individual learners' motivations to gain a new credential can be many and varied but can include getting a job, getting a better job and access to a more advanced course or to gain qualifications to maintain their existing employment.

More recently, there has been seen a growth in what is termed 'employer responsive' funding where the employer rather than the individual learner is funded for training. Typically employers use this funding, which normally requires an employer contribution, to upskill existing employees as part of the introduction of new products or processes thus addressing potential skill gaps. As was discussed earlier, most governments only fund accredited training leading to a recognised qualification to guarantee some 'additionality' over what staff development

and internal training an employer might reasonably do themselves. A recent example of this type of 'employer responsive' funding is the National Workforce Development Fund (NWDF) in Australia. As a condition of receiving funding, employers not only have to carry out only accredited training but are also strongly encouraged to submit a workforce development plan that should address issues of how to better use the skills of their employees.

Planning and Forecasting Have Their Limitations

An intermediate step between directly funding users rather than providers is for the funding body to specify what it wants to purchase from providers – rather than letting the providers decide themselves. This intermediate step known as a 'purchaser-provider model' happened in Australia in the 1990s under the aegis of the former Australian National Training Authority (ANTA). It means that funding bodies have to do some research into what they should be purchasing to satisfy individual learner and industry needs. In practice, priorities were often based on the outcomes of computerised models of the national economy such as those produced by Monash-Syntec. This was in some ways similar to the manpower planning that was popular with governments and large employers at that time.

The limitations of such forecasting have been well documented by Professor Sue Richardson and Yan Tan of the National Institute of Labour Studies at Flinders University (Richardson and Tan 2008). Richardson and Tan point out that it is notoriously difficult to predict with certainty how economies are going to perform into the future. Past trends can be influenced by a whole variety of factors such as changes in technology as well as political events and natural disasters. In the labour sphere, people change occupation and industry with increasing regularity, and the graduates of training institutions are only one of a number of sources of supply of skilled labour. People acquire new skills 'on the job', we import skilled migrants and people return from periods of unemployment or family duties such as child rearing. Many now believe that actual users, whether individuals or enterprises, are better at knowing their training needs as central planners using economic models. Another reason to shift to a 'demand-based/user-choice' system of funding.

In a paper commissioned by Skills Australia from the Workplace Research Centre at the University of Sydney, John Buchanan and Justine Evesson suggest:

> Two broad approaches to skills planning exist. The first used to be called 'manpower planning'. It concerns making projections about specific labour requirements at some specified time in the future. We refer to this as the workforce planning system. There is growing recognition that the major challenge concerns more than generating data on projected labour needs. Understanding the forces driving change and gathering data on how to engage with these is also important. We refer to this as the system of planning for workforce development.

Planning for Workforce Development

Planning for workforce development is thus more about understanding and responding to context and trends rather than trying to predict specific future labour market requirements. It is about giving users the tools to respond to changes in the labour market rather than predicting in detail what those changes might be.

Skills Australia in its advice to government adopts a planning for workforce development approach. It is based on three central 'pillars'. These are:

1. The concept and application of what we define as 'specialised occupations'
2. The use of scenarios to test a range of possible futures so that we can develop policy that is sufficiently flexible to cope with a range of potential outcomes
3. That public funding should be allocated to end users rather than providers

The Concept of Specialised Occupations Is Fundamental to Planning for Workforce Development as These Are the Ones with Greatest Risk of Market Failure

The concept of 'specialised occupations' is based on the proposition that policy makers should concentrate on those occupations that have the greatest risk of 'market failure'. In Australia, it takes 3 or 4 years to train and become licenced as an electrician and over 5 years to train and become registered as a dentist. If a shortage were to occur in these and similar occupations, the only ways to avoid a long pipeline of delay would be either to import qualified labour from overseas or attract any qualified personnel who had left or retired back into the profession. It is these types of occupations that we define as 'Specialised Occupations'. In contrast, occupations such as security guard or cook can be trained in a few months and in more generic, cross-industry occupations such as manager, people move around across many different industry sectors. In these 'non-specialised occupations', the market appears to work reasonably effectively. This is not to say non-specialised occupations are not important or that they do not deserve public funding.

Skills Australia has identified a range of criteria to identify specialised occupations. These are:

1. *Long lead time* – those skills which are highly specialised and require extended learning and preparation time, for example, 4 years or more for HE courses and 3 years or more to achieve a VET qualification.
2. *High use* – those skills which are deployed for the uses intended (i.e. there is a good occupational 'fit'). The rule of thumb is that there is more than a 50% match between the training and the destination occupation.
3. *Significant disruption* – where the opportunity cost of the skills being in short supply is high (e.g. registered nurse or doctor).

4. *High information* – where the quality of information about the occupation is adequate.

An occupation is considered 'specialised' if it meets at least two of the first three criteria, as well as the fourth criterion. Around 20% of occupations are classified as specialised.

Skills Australia uses the Specialised Occupation List (SpOL) as a key planning tool for its work on supply and demand in both the domestic and migrant skill supply channels.

Scenarios Create Plausible Future Worlds for Australia Which Can Be Used in Economic Modelling

Given the uncertainties in forecasting the future of national economies, industry structures and labour markets, Skills Australia has adopted the approach of developing a range of future scenarios so that policy can be developed that is flexible enough to deal with a range of possible futures. For its first National Workforce Strategy (Skills Australia 2010), Skills Australia used scenarios from the multinational company, Royal Dutch Shell to inform modelling of the supply and demand for skills in Australia.

The second national workforce development strategy will be published at the end of 2012, and, for this, Skills Australia is developing its own set of scenarios to create plausible future worlds for Australia to 2025. These scenarios will in turn influence economic modelling of the supply and demand for skills to 2025 that will inform the forthcoming 2012 strategy.

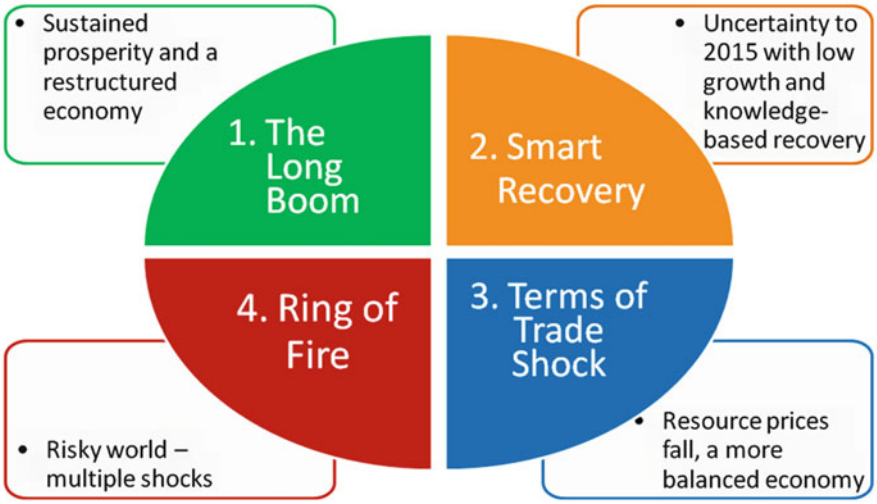
By comparing plausible alternative scenarios, the significance of different uncertainties can be better appreciated. Later a comparison of the model results based on these scenarios will identify how much different possible alternative future developments are likely to make to the demands for different skills and why and what response might then be most appropriate.

The scenarios are based around a number of economic, social, political and cultural drivers. Skills Australia began the scenario development process in 2011 by inviting a series of experts arranged by the Academy of Social Sciences in Australia (ASSA) to present some scoping papers at a seminar. Following consultation, six 'key drivers' influencing the Australian economy emerged. The key drivers and the experts who provided invaluable advice about them are:

1. Economic and financial trends and globalisation (Dr David Gruen)
2. Social, demographic and cultural trends (Professor Graeme Hugo)
3. Labour force, workplace and industrial trends (Professor Sue Richardson)
4. Governance and public policy (Professor Glyn Davis and Dr Michael Keating)
5. Science, technology and innovation (Professor Anthony Arundel)
6. Sustainability (focus on water, energy, population) (Dr Kerry Schott)

The papers are available on the Australian Workforce and Productivity Agency website at http://www.awpa.gov.au/.

Based on our assessment of the six key drivers, Skills Australia has developed four scenarios which describe different plausible paths for Australia that could influence the evolution of the demand and supply of skills between now and 2025.



In the *Long Boom* scenario there is a speedy recovery from the global financial uncertainty of 2012. Asia is becoming the world centre of gravity, and the rapidly urbanising populations of the PRC and India provide a continuing market for Australian resources. Mining and construction thrive, bringing continued prosperity to Australia.

The high Australian dollar maintains the pressure on trade-exposed industries. In a restructured economy, firms adopt productivity-enhancing strategies to remain competitive.

In *smart recovery* scenario, Australia experiences a low-growth economy from 2014 to 2015. The European downturn is protracted and there is continuing instability in global financial markets. Growth in the PRC and Indian economies slows, the demand for Australian resources drops and the terms of trade and Australian dollar move lower. Slowly, global growth resumes from 2014 to 2015, heralding a return to growth for Australia. Our companies and government are challenged to improve productivity and a knowledge-based recovery follows, although the impact of technology means that there are fewer opportunities for those with lower skills.

Terms of trade scenario sees new global sources of mineral and energy resources come on stream, leading to an oversupply of commodities. Prices fall, Australia's terms of trade decline and the dollar loses value. Geopolitical issues in the region undermine the environment for good trade relations with the PRC. Australia uses the crisis as an opportunity to move to a broad-based economy. We re-establish a

viable manufacturing sector and build strong and internationally competitive businesses.

The *ring of fire* scenario is a world of ongoing uncertainty and volatility. Australia and the rest of the world lurch from one crisis to the next. Recovery from the European downturn is slow. Natural disasters and severe weather events occur on a regular basis, damaging industry and costing human lives. Political unrest destabilises parts of Asia. There are ongoing nuclear warfare threats and skirmishes over resources, especially water security. Increased protectionism reduces trade between countries and Australia too is protectionist, but globalisation is the new paradigm and cannot be ignored. In the midst of the doom and gloom, the lower Australian dollar substantially improves the position of trade-exposed industry sectors.

Scenario Modelling

In Skills Australia's first national workforce strategy *Australian Workforce Futures*, the major proposals were to (Skills Australia 2010, p. 9):

- Sustain economic growth and raise productivity by increasing skills and avoiding future skills shortages – a way to achieve this is by increasing Australia's education and training efforts by 3% in 2025 to deepen the level of skills in the workforce.
- Lift workforce participation to 69% by 2025 to provide the required workforce and improve social inclusion – with specific targets to increase workforce engagement of groups with relatively low participation rates. For example, women aged 25–34 years, men aged 25–64 years and older Australian's aged 55–64 years.
- Lift the unacceptably low level of adult language, literacy and numeracy to enable effective educational, labour market and social participation.
- Increase productivity, employee engagement and job satisfaction by making better use of skills in the workplace.

Skills Australia has recently commissioned Deloitte Access Economics to undertake econometric modelling of the four scenarios described earlier to give outputs for such variables as industry structure, labour market demand and skills supply. Working within these parameters, the model identifies the implications for industry and occupations and, as a consequence, the supply and demand of qualifications for each scenario.

After a period of consultation with industry and governments, strategies will be developed that can be incorporated into a new National Workforce Development Strategy. The strategies will be sufficiently generic so that they cope with a range of futures.

Skills Utilisation

Skills Australia is seeking to create greater awareness of skills utilisation as a policy issue and support the promulgation of better skills use in Australian enterprises. To this end, in April 2012, Skills Australia published *Better use of skills, better outcomes: A research report on skills utilisation in Australia*. The report aims to inform policy makers and academics about how skills utilisation occurs in workplaces and contributes to the development of policy and practice in this area. The companion publication *Better use of skills, better outcomes: Australian case studies* aims to inspire employers to think differently about how they organise work, by showcasing 11 small, medium and large organisations across Australia that have put in place tailor-made strategies to ensure that the skills and talents of their workplace are fully utilised.

The Practices that Lead to Effective Skills Management Are Varied and Are Based on Commitment to Understanding the Range of Skills Already Existing in the Workforce

A number of practices were found to promote effective skills use in the 11 Australian organisations. A summary of the types of initiatives identified follows.

An important aspect of skills utilisation is that of job design, which is a work arrangement designed to make full use of employees' skills and abilities. *Job redesign* looks at how work roles have been adjusted, re-visioned and renegotiated to enable better use of employee skills. Aspects of job redesign can include teamwork and flexibility in job descriptions and work arrangements.

Employee participation strategies are intended to empower staff so that they have a say and exercise some control over their day-to-day work, their roles and conditions in the workplace (Poutsma 2001, p. 5). These strategies are crucial for innovation and organisational change (Green et al. 2010, p. 177).

Autonomy is a key indication of job quality and is connected to 'the need to think about as well as to do work' (Green et al. 2010, p. 164). Decision authority (being able to make decisions affecting their work on a daily basis), skill discretion (being able to use and improve one's skills set) and taking discretion (being able to exercise control over one's job) are all features of worker autonomy (Green et al. 2010, p. 168).

Job rotation provides employees with a range of different work experiences and a wide variety of skills, generally by moving employees through various job roles and parts of the organisation over time. By moving employees through different jobs/role/positions, it facilitates learning and use of new skills.

Skills audits are used to identify the skills and knowledge within an organisation and highlight any gaps that might exist between the skills requirements of the organisation and the actual skills of its personnel. In addition to skills matching,

skills audits can also help to identify the skills that are unused within an organisation, as well as those that are missing altogether which are needed within the workforce. Knowing where the gaps exist enables firms to decide how to organise work and make the best use of skills within their existing staff. Skills audits can also be used to identify development and training needs, help with succession planning and recruitment and ascertain whether there are skills within the organisation that remain unused or underutilised (Skills Australia 2010, p. 5). In this respect, skills audits can be useful in supporting workforce development planning.

Closely linked with job rotation is *multi-skilling*, whereby employees are trained in multiple skill sets enabling them to undertake tasks that may fall outside their traditional job description.

Knowledge transfer is another aspect of skills use and development which has shown to help employees gain the confidence to apply their talents and skills in the workplace. Knowledge transfer occurs when the skills and experience of employees are shared within the organisation, thereby contributing to workforce development.

Mentoring involves creating a learning relationship between an experienced person with professional expertise and a less experienced staff member. These associations enable the mentor to share their knowledge with the objective of developing the mentee's skills and understanding of both the subject area and the workplace. In this way, mentoring can promote better skills use by enhancing the learning, enabling knowledge transfer and embedding the skills of employees. Mentors can also provide support, advice and career guidance.

The Critical Success Factors Lie with Management and Their Commitment to Nurturing the Skills and Talents of Their Workforce

Skills Australia identified a number critical success factors from its study of these 11 Australian organisations that had improved their skills utilisation.

The commitment of senior and supervisory staff is essential. Good leaders and managers encourage creativity and innovation in employees by enabling measured risk-taking and providing opportunities for staff to have a say in business processes. Leadership structures are important, but effective leaders also encourage individuals to take responsibility. Delivering on promises or 'doing what you say you are going to' is important. Skills Australia found that following commitments with action is important in establishing integrity as well as developing and maintaining trust. Leaders need to be accountable and transparent. Accountability is important in ensuring that suggestions and ideas provided by employees are handled in a positive way. The development of middle and front-line managers, through training and mentoring, ensures firms have the necessary leadership and people management skills in place for workplace change to occur.

Leaders need to be good at change management. This is essential to effective skills utilisation as it helps leaders to, firstly, identify the organisation's need for change, and, secondly, determine its capability and capacity for change.

The right organisational culture, largely meaning a supportive, inclusive workplace environment, can encourage employees to contribute their ideas. Managers need to ensure that culture and values are consistent across the organisation and that different cultures are not operating in different parts of the organisation. This can be a challenge for larger firms.

It is hardly surprising that the study found communication, consultation and collaboration were important. Actively listening to the ideas of employees is a crucial way of involving them, as is recognising staff contributions within the workplace. Transparency of information gives staff a sense of how their work contributes to the business. This can inspire commitment and contribute to the success of the organisation.

Engaging staff in decision-making and continuous improvement processes brings rewards to enterprises, in terms of both financial and relationship benefits.

There is no 'cookie-cutter solution' to improve skills utilisation. Organisations benefit from treating everyone as an individual and by recognising that everyone's needs are different.

The more employees feel that they are valued and being listened to, the more likely they are to be motivated to participate in workplace initiatives and, therefore, contribute to a company's success.

As a result of the implementation of these strategies, the companies achieved higher staff retention rates in a very competitive economy where unemployment is around 5%. Staff motivation and satisfaction often rose, and through multi-skilling and job rotation, the worst impacts of skills shortages and skills gaps were avoided. New processes were implemented as the result of staff suggestions – one of a number of ways that these strategies contributed to the bottom lines.

Conclusion

Australia has a long tradition of public and private investment in skills development. This investment has paid off as there are clear linkages between the possession of qualifications and higher levels of workforce participation and higher earnings. Higher earnings are often taken as a proxy measure for increased levels of productivity. However, until recently most of these initiatives have been on the supply side – government has 'bought' more courses and places. It has also instigated major reforms of the VET system to make it competency based and industry led. The next stage is to put an emphasis on the demand side and improve how skills are utilised in the workforce. Without this, some of the investment by government, individuals and enterprise might be wasted. This is a far more difficult task as it involves altering behaviours and practices within the workplace. An emphasis on workforce development rather than just the supply of skills will help further these objectives. This is now the priority for agencies such as Skills Australia and its successor body, the Australian Workforce and Productivity Agency.

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Chapter 8
Qualifications, Skills, and Workforce Effectiveness: The Relevance of the OECD's Survey of Adult Skills to Asia

William Thorn and Andreas Schleicher

Introduction

Improving the process of the development, maintenance and use of skills is increasingly recognised as a core element of the policy package necessary to support sustainable long-term growth and employment creation and contribute to a fairer distribution of income and opportunities. The recently released OECD Skills Strategy (OECD 2012b) identifies three key areas for action by governments.

- *Developing relevant skills*: Ensuring that the supply of skills is sufficient in both quantity and quality to meet current and emerging needs is a central goal of skills policies. Supply can be ensured by developing the right mix of skills through education and training and influencing the flow of skills by attracting and retaining talent. Importantly, supply is not only responsive to demand; it can also have an important influence on demand.
- *Activating skills*: People may have skills, but for a variety of reasons may decide not to offer them to the labour market. Individuals withdraw from the labour force for a range of reasons, including personal preferences, life circumstances or the lack of financial incentives to work. Encouraging inactive individuals to enter or re-enter the labour force can increase the skills base of an economy. This requires identifying inactive individuals, possibly retraining them, ensuring that the benefit system offers them financial incentives to enter or return to the labour market and removing demand-side barriers to hiring.
- *Putting skills to effective use*: Investment in skills development by individuals and governments needs to be accompanied by policies that ensure that these skills are used effectively. Moreover, the match between the skills demanded in

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a job and the skills of the person doing the job has an impact on further skills development: unused skills tend to atrophy, while new skills are, to a large extent, developed informally, often through work experience.

A focus of the work of the OECD in supporting governments in dealing with issues of skill formation is that of the enhancement of the evidence base. Areas in which there are major information gaps include measures of skills endowment of the population which go beyond information about educational qualifications, the processes by which skills are gained, maintained and lost over the lifecycle and the effectiveness of the utilisation of skills. The OECD Survey of Adult Skills[1] represents an initiative of the OECD that will provide governments, policy makers and researchers with some of the essential information needed to review and develop policies and interventions relating to the development, maintenance and use of skills. The survey has as its objectives to:

- Identify and measure differences between individuals and across countries in key competencies believed to both underlie personal success and respond to labour market requirements.
- Assess the impact of competencies on a range of economic and social outcomes.
- Assess the performance of education and training systems, workplace practices as well as labour market policies, in generating competencies at the levels required by social and economic demands.
- Help identify policy levers to reduce 'deficiencies' in key competencies.

To this end, the OECD Survey of Adult Skills combines a direct assessment of cognitive skills that provide a foundation for effective participation in the societies and economies of the twenty-first century, the collection of information on the use of cognitive skills and other generic skills in the workplace (and other contexts) and information concerning the factors associated with the development, maintenance and loss of skills as well as the information on the outcomes of skills.

Currently, the OECD Survey of Adult Skills is being implemented by over 30 countries in Europe, the Americas and the Asia/Pacific region (see Annex A for the full list). Results from the first round of the assessment involving 24 countries which started in 2008 will be released in October 2013. A second round of the assessment began in late 2011 with results being available in mid-2016.

This chapter provides an overview of the main features of the OECD Survey of Adult Skills and describes how the data provided by the assessment is relevant to many of the issues concerning the development and operation of education and training systems and the relationship of these systems to the labour market which preoccupy policy makers and governments in the countries of the Asia-Pacific region.[2] Some additional information about participation in the survey and its operational aspects is presented in Annex A.

[1] An output of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC).

[2] Currently, six countries from the Asian-Pacific region are participating in the OECD Survey of Adult Skills – Australia, Japan and Republic of Korea (Round 1) and Indonesia, New Zealand and Singapore (Round 2).

What Is the OECD Survey of Adult Skills?

The OECD Survey of Adult Skills involves the administration of a questionnaire and self-completed assessment of key foundation skills to nationally representative samples of adults (16–65 year olds).

As implemented in the first cycle of the programme, the survey contains the following components:

- A direct assessment of the proficiency of adults (16–65 year olds) in the domains of literacy, numeracy and problem solving in technology-rich environments (TRE);
- A module of questions regarding the use of a range of generic skills at work;
- A background questionnaire which contains questions regarding demographic characteristics, social and linguistic background, educational attainment and participation, training participation, employment status and income, use of ICTs and literacy and numeracy practices.

The Direct Assessment

The direct assessment component of the OECD Survey of Adult Skills evaluates the skills of adults in three domains, those of literacy, numeracy and problem solving in TRE. Before outlining the way in which each of these domains is conceptualised in the OECD Survey of Adult Skills, the question of why these particular skills are assessed is addressed and some important general features of the way in which these skills are conceptualised in the assessment are discussed.

Literacy, numeracy and problem solving in TRE are assessed in the OECD Survey of Adult Skills as they are considered to constitute 'key' competencies important for achieving a *successful life* and a *well-functioning society* (Rychen and Salganik 2003). They are 'key', firstly, in the sense that they provide a foundation for the development of other higher-order cognitive skills as well as constituting a precondition for gaining access to and understanding of specific domains of knowledge. Being able to read, manage mathematical and numerical information and solve problems are essential for the development of higher-order analytic and communication skills, for example. Secondly, they are relevant in an extremely broad range of life contexts, from education through work to everyday life. In information-rich societies in which information in text format (whether print-based or digital) is ubiquitous, a capacity to effectively read and react appropriately to text-based information is essential, whether in terms of understanding the user information on a packet of medicine or responding appropriately to a memo from a colleague or superior at work. Similarly, numerical and problem-solving skills are essential in most areas of life (e.g. to undertake monetary transactions, to plan a holiday).

Two features of the approach to the assessment of literacy, numeracy and problem solving in the OECD Survey of Adult Skills are important to mention before looking at the definition of the individual skills domains.

The skills measured in the OECD Survey of Adult Skills are viewed as functional skills. Reading, numerate behaviour and solving problems are conceived as purposive activities in which people engage, not as ends in themselves but to achieve various goals in a variety of real world contexts (e.g. in the workplace, in educational settings or at home). From this it follows that the focus of the OECD Survey of Adult Skills is not on the measurement of skills associated with the ability to read or understand mathematical concepts, for example, but on the application of these skills for specific purposes in specific contexts.

In addition, the OECD Survey of Adult Skills defines the skills assessed in terms of a continuum of proficiency. The skills measured are seen as something a person has more or less of rather than as something one either has or does not have. In other words, there is no threshold on the skill continuum which separates those who have a particular skill from those who do not (e.g. distinguishes illiterates from literates). Individuals with higher levels of proficiency have greater chances of undertaking more complex information processing tasks than those with lesser proficiency. At the highest levels of proficiency, individuals are able to successfully complete tasks that demand the use of complex cognitive operations.

It should also be noted that the objective of the OECD Survey of Adult Skills is to gain an accurate picture of the *entire spectrum of proficiency* of the adult population. In other words, it seeks to provide information regarding adults with high levels of skills as well as those with low skills. While skills such as literacy and numeracy are sometimes presented as 'basic' skills (in the sense of providing a 'foundation' for the development of other competencies), the OECD Survey of Adult Skills is not an evaluation which focuses on assessing the achievement of a basic level of skill.

The way in which literacy and numeracy and problem solving in TRE are defined in the OECD Survey of Adult Skills is briefly described below. More detailed information on the definition of these constructs is contained in Annex B.

Literacy

Literacy is defined in the OECD Survey of Adult Skills as *understanding, evaluating, using and engaging with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential* (OECD 2012a: 19). 'Literacy' in the OECD Survey of Adult Skills does not include the ability to write or to produce text, skills commonly falling within the definition of literacy.[3] However, at the same time, 'literacy' is a broader construct than 'reading',

[3] The practical difficulties of assessing writing skills in the context of an international assessment made it impossible.

narrowly understood as a set of strategies for decoding written text. It is intended to encompass the range of cognitive strategies (including decoding) that adults must bring into play to respond appropriately to a variety of texts of different formats and types in the range of situations or contexts in which they read. A unique feature of the assessment of literacy in the OECD Survey of Adult Skills is that it assesses adults' ability to read *digital* texts (e.g. texts containing hypertext and navigation features such as scrolling or clicking on links) as well as traditional print-based texts.

To provide more detailed information about adults with poor literacy, the assessment of literacy in the OECD Survey of Adult Skills is complemented by a test of 'reading component' skills. Reading components represent the basic set of decoding skills which provide necessary preconditions for gaining meaning from written text – knowledge of vocabulary, ability to process meaning at the level of the sentence processing and fluency in the reading of passages of text.

Numeracy

Numeracy is defined in the OECD Survey of Adult Skills as *the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life* (OECD 2012a: 34). Numeracy is further specified through the definition of 'numerate behaviour' which involves managing a situation or solving a problem in a real context by responding to mathematical information and content represented in multiple ways.

It is recognised that literacy skills such as reading and writing constitute an enabling factor for numerate behaviour and that when mathematical representations involve text, performance on numeracy tasks is, in part, dependent on the ability to read and understand text. However, numeracy in the OECD Survey of Adult Skills involves more than applying arithmetical skills to information embedded in text. In particular, numeracy relates to a wide range of skills and knowledge (not just arithmetic knowledge and computation), a range of responses (which may involve more than numbers) and responses to a range of representations (not just numbers in texts).

Problem Solving

In the OECD Survey of Adult Skills, problem solving in technology-rich environments is defined as *using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks*. The first wave of the OECD Survey of Adult Skills focuses on *the abilities to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, and accessing and making use of information through computers and computer networks* (OECD 2012a: 47).

The PS-TRE (problem solving in technology-rich environments) domain of the OECD Survey of Adult Skills covers the specific class of problems people deal with when using ICT. These problems share the following characteristics:

- The existence of the problem is primarily a consequence of the availability of new technologies.
- The solution to the problem requires the use of computer-based artefacts (applications, representational formats, computational procedures).
- The problems are related to the handling and maintenance of technology-rich environments themselves (e.g. how to operate a computer, how to fix a settings problem, how to use the Internet browser in a technical sense).

Problem solving in TRE represents a domain of competence which involves the intersection of the set of skills that are sometimes described as 'computer literacy' (i.e. the capacity to use ICT tools and applications) and the cognitive skills required to solve problems. Some knowledge of how to use basic ICT input devices (e.g. use of a keyboard and mouse and screen displays), file management tools, applications (word processing, email) and graphic interfaces is essential in order to be able to undertake assessment tasks. However, the objective is not to test the use of ICT tools and applications in isolation, but rather to assess the capacity of adults to use these tools to access, process, evaluate and analyse information effectively.

Other Information on Skills

Literacy, numeracy and problem solving in TRE constitute a subset of the skills and competences that are demanded in the labour market and/or mediate access to resources and services more generally in society. Along with specific technical and professional skills, other generic skills such as communication, interaction skills (such as the capacity to relate to others and work cooperatively), skills related to learning and the transmission of knowledge as well as physical skills are valued to a greater or lesser extent in the labour market. Most of these skills are difficult, if not impossible, to assess directly, either in an international comparative context or using surveys methods.[4] The OECD Survey of Adult Skills collects a considerable amount of information on the skills possessed and used by adults in addition to the measures of proficiency in literacy, numeracy and problem solving in TRE.

[4] A framework for the measurement of teamwork was developed for the ALL study, but was not considered robust enough for inclusion in an international comparative assessment (Murray et al. 2005). See Baethge and Arends (2009) for the results of a feasibility study of measures of vocational skill in an international comparative context.

Qualifications and Work Experience

Educational qualifications and work experience are commonly used proxies for individuals' skill endowments. The OECD Survey of Adult Skills collects information on respondents' highest level of educational attainment as well as information regarding the duration of work experience and mobility. This is complemented with information on their perceptions regarding the educational qualifications and work experience they believe are normally necessary to get the job they currently occupy as well as the qualifications needed to perform this job satisfactorily.

Use of Skills at Work

Information is collected from respondents regarding four broad categories of generic work skills: cognitive skills, interaction and social skills, physical skills and learning skills.[5] Cognitive skills encompass reading, writing, mathematics and the use of ICTs. Interaction and social skills cover collaboration and cooperation, planning the work and time of one's self and others, communication and negotiation, and customer contact (e.g. selling products and services and advising). Physical skills involve the use of gross and fine motor skills. Learning skills cover activities such as the instruction of others, learning (formally or informally) and keeping up to date with developments in one's field of professional activity.

The approach used in the OECD Survey of Adult Skills owes much to the Jobs Requirements Approach (JRA) pioneered in the UK Skills Survey (Felstead et al. 2007). The JRA method consists of asking individuals about the importance of different types of tasks performed at work and subsequently inferring the types of skills that are required from their answers. By focusing on job tasks, this approach is considered to provide a more objective description of these skills than an approach relying on subjective self-assessments by individuals of the type and level of skills they possess.

Respondents are also asked about the extent to which they believe that their skills (considered globally) match the requirements of the job in which they are currently working.

Work-Related Training

Given the importance of work-related training as a potential source of skills and as an element of a strategy for the maintenance and upgrading of workforce skills, information is collected on participation by respondents in training of both a formal and informal nature over the 12 months prior to the interview.

[5] The exact questions asked can be found in OECD (2010a).

Personal Characteristics, Background and Outcomes

The OECD Survey of Adult Skills background questionnaire includes a range of information regarding the factors which influence the development and maintenance of skills such as education, social background, engagement with literacy and numeracy and ICTs, and language, as well as information on outcomes which may be related to skills. Information is collected on the current activity, employment status and income of respondents. In terms of noneconomic outcomes, the OECD Survey of Adult Skills includes questions on health status, volunteering, political efficacy and social trust.

What Can the OECD Survey of Adult Skills Tell Us?

As can be seen from the description of its content, the OECD Survey of Adult Skills will provide researchers and policy makers with comprehensive information regarding the 'supply' of key cognitive skills, the use of cognitive and other generic skills at work, engagement with literacy, numeracy and ICTs outside work as well as background factors, education and labour market and other outcomes. The information provided will allow analysis of a range of issues concerning the level and distribution of these skills in the population, the factors that contribute to the development and maintenance of these skills and their potential influence on a range of outcomes.

An idea of the range of information that will be available from the OECD Survey of Adult Skills and its relevance to policy concerns can be gained from the literature using data from the two previous international adult literacy and skills surveys, the International Adult Literacy Survey (IALS) and the Adult Literacy and Life Skills Survey (ALL).[6] A survey of this literature which covers themes such as the distribution of proficiency, the impact of literacy on labour market outcomes, the factors affecting the development of literacy, skills match and mismatch is available in Thorn (2009). In this section, the contribution of the OECD Survey of Adult Skills in three areas is discussed.

The Level and Distribution of Proficiency in Key Skills

Illiteracy and poor literacy (as well as poor numeracy) represent a considerable hurdle to the full and fulfilling participation of individuals in the economy and society. Other things being equal, low performance in literacy and numeracy is associated with

[6] Results from IALS can be found in OECD and Statistics Canada (2000) and from ALL in Statistics Canada and OECD (2005) and OECD and Statistics Canada (2011).

higher chances of unemployment, lower earnings, lower participation in continuing education and training and poor health (OECD and Statistics Canada 2000, 2011; Statistics Canada and OECD 2005). At the macro-level, poor literacy and low levels of cognitive performance in the population more generally may constrain the potential for growth.

For many countries in the Asia-Pacific region, illiteracy and poor literacy among adults and young people represent a reality and challenge for governments. Literacy rates for adults remain low particularly in South and West Asia where Bangladesh, Bhutan, India, Iran, Nepal and Pakistan have literacy rates for adults of between of 53 and 82% as well as in Cambodia, the Lao Republic and Papua New Guinea. Literacy rates are in most cases lower for women than men (UNESCO 2011: table 2). Literacy rates for youths (15–24 year olds) are higher than for their older compatriots. However, the evidence from PISA suggests that for a number of countries in the Asian region, even where illiteracy *per se* has been eradicated, poor literacy will remain a problem for some years to come. For example, in Azerbaijan, Indonesia, Kazakhstan, Kyrgyz Republic and Thailand, countries in which youth have literacy rates of around 100%, there are significant proportions of 15-year-old school students performing at the lowest levels on the PISA reading literacy scale (OECD 2010b).

Even in countries with developed economies, negligible rates of adult illiteracy and high levels of performance in PISA, poor literacy among adults constitutes a potential policy concern. IALS revealed that a significant proportion of adults in developed countries have low levels of literacy and numeracy and may have difficulty in responding to many of the literacy and numeracy demands they face in their work and everyday life (OECD and Statistics Canada 2000), findings that were confirmed by the ALL survey (Statistics Canada and OECD 2005; OECD and Statistics Canada 2011). For example, in both Australia and New Zealand,[7] around 40% of adults were found to perform at the two lowest levels of literacy proficiency[8] in IALS and ALL (ABS 2008 and Satherley et al. 2008). Improvement of the levels of literacy and numeracy among adults was identified as one of the major areas in which action was needed in a national Workforce Development Strategy developed recently in Australia (Skills Australia 2010). It is likely that these types of findings would be replicated to a greater or lesser degree in other countries in the Asia-Pacific region with high per capita GDP and/or high performing school systems.

The OECD Survey of Adult Skills will offer policy makers and researchers a snapshot of the level and distribution or variability of proficiency in key foundation skills in the adult population. It will be possible to look at the performance of key subgroups of the population and, depending on the sample size, by geographic

[7] The only countries in the Asia-Pacific region for which results are available. The Republic of Korea participated in ALL, but results have not been released.

[8] At level 2 on the literacy scale, tasks involve the location of single pieces of information in text (with some distracters present), low level inferences and integrating information in different parts of a document (Statistics Canada and OECD 2005).

region. The estimates of proficiency will be able to be compared with those of other participating countries.

The information provided by the OECD Survey of Adult Skills will go well beyond knowing the proportions of the population above and below a threshold defining a desirable minimum level of proficiency (e.g. literate or illiterate). It will be possible to identify the proportion of the population, for example, who are fully equipped to handle complex text-based information processing tasks. At the other end of the scale, it will be possible to identify the proportion of adults who possess basic skills but struggle with coping with many of the reading tasks required to function effectively in modern society.

The OECD Survey of Adult Skills will offer the most comprehensive set of information available on the capacity of the adult population to access and manage information and display higher-order cognitive skills in digital environments. This encompasses not only the reading of digital texts but also the capacity to integrate information from multiple sources and appropriately use digital applications and tools to solve the problems. The OECD Survey of Adult Skills will thus allow policy makers to have a far deeper understanding of the digital competence of the population than is available from usage statistics.

In the case of the poorest readers, the reading components assessment will provide a wealth of information on their strengths and weaknesses, for example, in terms of basic vocabulary, basic comprehension and fluency. The OECD Survey of Adult Skills measures will aid policy makers in identifying and understanding the extent and dimensions of illiteracy and poor literacy. Having a detailed picture of the spectrum of ability will assist policy makers target and design programmes, not only to eradicate illiteracy but also to improve the skills of adults with some basic literacy. The latter, in particular, is an area which will become increasingly important as a component of a comprehensive strategy to develop the human resources necessary to underpin continued economic growth and development and raise productivity.

The Use of Generic Skills at Work

There is a broad consensus regarding the importance of generic skills in the modern workplace and also regarding the importance of ensuring that education and training systems develop these skills among young people in preparation for entry to the labour market. Shifts in employment towards services (which place a premium on interaction with clients), rapid technological change, especially computerisation (which has been argued to have led to a shift towards employment in occupations involving complex communication and expert thinking),[9] changes in work organisation emphasising teamwork, flexible production and multi-skilling

[9] See Autor et al. (2003).

and increasing competition and rapid change in consumer tastes have all been argued to increase demand for workers with broad-based thinking and interaction skills as well as technical competence and knowledge.

In this context, there have been a number of exercises that have sought to identify and group the key generic competencies needed in the modern workplace and that should be developed alongside occupational specific skills, particularly in preparing young people for entry to the labour market (see, for example, SCANS 1991; Mayer 1992; DEEWR 2012). Most frameworks identify similar clusters of competencies: basic or foundation skills such as literacy and numeracy, higher-level cognitive skills such as problem solving and analytical reasoning, interpersonal skills such as communication, working in teams and ability to negotiate, ability to use technology particularly ICTs and learning skills such as knowing how to learn. These types of findings seem generalisable. A recent study of graduate employability in three Asian countries[10] found that employers placed considerable emphasis on the possession of soft skills by university level graduates (UNESCO Bangkok 2012). The World Bank (2010) has also recently emphasised the importance of behavioural skills such as teamwork, diligence, creativity and entrepreneurship in its STEP skills development framework.

Despite the importance attributed to generic skills, there is little hard evidence regarding either the demand for or the supply of such skills, especially from a comparative perspective. The OECD Survey of Adult Skills will fill a considerable void in this area. On the supply side, the OECD Survey of Adult Skills will provide information regarding the proficiency of the workforce in the domains of literacy, numeracy and problem solving in TRE. While these cognitive skills represent a subset of the bundle of generic skills that are valued on the labour market, they constitute key indicators of the ability to manage the information processing tasks that are of growing importance in a knowledge-based economy such as 'complex communication' and 'expert thinking' (see Levy 2010). On the demand side, the OECD Survey of Adult Skills will offer a comprehensive picture of the incidence and intensity of use of a range of generic skills at work for the countries participating in the study and provide a baseline for looking at change in the use of these skills over time. It will also allow analysis of the relationship between the generic skill content of jobs and the occupational and industry structure of employment in different countries as well as the impact of the use of generic skills on earnings and productivity.

Matching the Supply of and Demand for Skills

Ensuring a better match between the supply of and the demand for skills has emerged as a key issue for policy across the world. Concerns include the existence

[10] Indonesia, Malaysia and the Philippines.

of persistent skill shortages, high rates of unemployment among particular population groups such as youth (which sometimes coexist with labour shortages), the oversupply of individuals with certain skills and types of qualification, and the failure of employers to make the most of the skills their employees possess. Optimising the use of skills has been identified as a central theme of the OECD Skills Strategy (OECD 2011b) and by the World Bank in its framework for skills development (STEP) (World Bank 2010).

In the Asia-Pacific region, there is evidence of the existence of mismatches of various types in many countries. On the one hand, a recent study by the Manpower Group (2011) found that employers in the Asia-Pacific region[11] had more difficulty than employers elsewhere in filling positions and the proportion of employers reporting such difficulties had increased since 2008. Skills shortages, particularly of higher-level vocational skills, are the focus of policy action in a number of countries such as India, the People's Republic of China and the Republic of Korea. On the other side, an oversupply of graduates with higher education qualifications is seen as a problem in the Republic of Korea. Youth unemployment is high in economies such as Indonesia, the Republic of Korea, Taipei,China and Hong Kong, China. (ILO 2012). Making better use of the skills of the workforce has been identified as a central element of a proposed National Workforce Development Strategy in Australia (Skills Australia 2010).

A useful framework for examining the question of matching the supply of, and demand for, skills is provided by Fig. 8.1. In addition to the phenomena of shortages (where job vacancies remain unfilled for lack of supply of suitable applicants) and unemployment (when individuals cannot find work due to lack of demand for their skills), there are also phenomena of mismatch in which workers are employed in jobs which either do not make full use of the skills that they possess (underemployment or over-skilling) or alternatively require skills which they do not have to the required level (skill gaps, under-qualification or under-skilling). The latter phenomena may arise for a number of reasons. These include individual preferences (e.g. for jobs that provide flexibility in hours of work), labour market rigidities which provide disincentives for mobility, inadequate labour market information, over- or undersupply of certain types of labour, technological change and poor human resource practices in firms (poor recruitment processes, under-provision of training or poor job design and task allocation).

Mismatch in the form of skills gaps and underemployment has become a topic of increasing interest to researchers and policy makers over recent years (CEDEFOP 2010; Desjardins and Rubenson 2011; OECD 2011a). In fact, skills gaps have been argued to be a more serious problem than shortages (UKCES 2009).

In looking at these issues, it is important to distinguish between *qualifications* mismatch and *skills* mismatch. Qualifications mismatch refers to a discrepancy between the highest qualification held by a worker and the qualification required by

[11] Employers were surveyed in eight economies in the region: Australia, the People's Republic of China, Hong Kong, China, India, Japan, New Zealand, Singapore and Taipei,China.

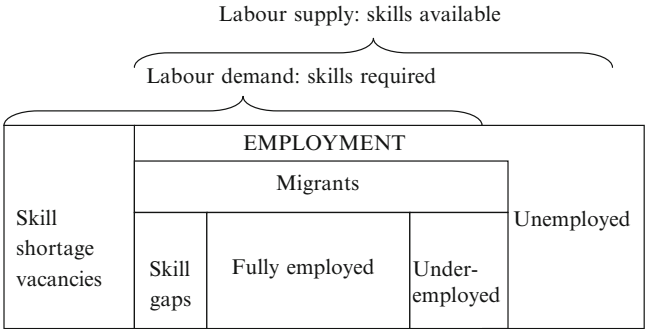

Fig. 8.1 Components of labour supply and demand (Source: UKCES 2010: 40)

his/her job. Skills mismatch refers to a discrepancy between the skills – both specific and general – possessed by a worker and the skills required by his/her job (OECD 2011a). Skills mismatch has been much less studied than qualification mismatch (largely because of data availability), and when it has been, it has been done so largely on the basis of subjective information.[12]

The OECD Survey of Adult Skills will provide one of the most comprehensive sources of information available for the analysis of mismatch both in terms of the range of information it collects and the number of country observations. At the same time as providing data on subjective appreciations (self-reports) of over- or under-qualification and over- and under-skilling, it will represent one of the few available sources of information which permits the exploration of skills mismatch using 'objective' measures of the skills of workers in the form of proficiency in literacy, numeracy and problem solving in TRE.[13] The combination of measures of proficiency with information on the use of reading, numerical skills and computer use at work will provide a powerful tool for looking at mismatches between skills and job requirements for these key cognitive skills. In addition, the OECD Survey of Adult Skills contains information that allows examination of the impact of mismatch on factors such as wages and job satisfaction and access to training as well as the relationship between mismatch and factors such as age, gender, educational attainment and immigration status.

A recent OECD working paper offers an example of what type of analyses will be able to be accomplished using the OECD Survey of Adult Skills. Desjardins and Rubenson (2011) use data from ALL to examine the extent of match between the literacy and numeracy proficiency of workers and the literacy and numeracy tasks they undertake at work and the impact of mismatch on earnings and access to training.

[12] For example, answers to questions such as whether more training is needed to effectively undertake job tasks (under-skilling) or whether the respondent has the skills to cope with more demanding duties (over-skilling).

[13] The OECD Survey of Adult Skills does not measure proficiency in technical or professional skill.

Literacy and numeracy match and mismatch are defined by Desjardins and Rubenson (2011) on the basis of reported engagement in literacy-related tasks at work and direct measures of the literacy skills of workers. Persons with reading engagement scores below the median are assigned to the 'low- to medium-low-engagement' category (low-skill job), and those scoring above to the 'medium-high- to high-engagement' category (high-skill job). Similarly, persons scoring at skills Levels 1 and 2 on the prose literacy scale are assigned to the 'low-skills' category, and those scoring at Levels 3 and 4/5 assigned to the 'high-skills' category. Four match and mismatch categories are identified:

- Low-skill, low to medium-low engagement = LOW-SKILL MATCH
- Medium- to high-skill, medium-high to high engagement = HIGH-SKILL MATCH
- Low-skill, medium-high to high engagement = DEFICIT MISMATCH
- Medium- to high-skill, low to medium-low engagement = SURPLUS MISMATCH

In the nine[14] countries included in the analysis, the proportion of literacy and numeracy *matches* is about 59–69% and 48–65%, respectively, depending on the country. Literacy and numeracy *mismatch* is a widespread phenomenon with 31–41% and 35–52%, respectively, of workers having skills that do not match the requirements of their job, depending on the country. Skill *deficits* are apparent in every country with 9–29% (literacy) and 6–20% (numeracy) of the workforce falling into this category, depending on the country. The level of *surplus* of literacy and numeracy skills also varies substantially by country, ranging from 12–32% to 17–46%, respectively.

In addition to examining the incidence of literacy and numeracy match/mismatch, Desjardins and Rubenson look at the distribution of mismatch by age, gender and immigration status and the impact of mismatch on earnings and access to training. Literacy *surpluses* are found to be greater among younger (16–35 year olds) workers, women and immigrants. In terms of earnings, the characteristics of jobs relating to literacy use are found to have a substantial effect on earnings. Being in a situation of high- skills match and a situation of deficit mismatch are associated with earnings premiums whereas being in a situation of surplus mismatch is associated with a small earnings penalty relative to individuals in situations of low-skills match. Access to employer supported training is also found to be closely linked to job requirements. As in the case of earnings, workers in jobs which entail high-literacy requirements have higher probabilities of access to training than those in jobs with low-literacy requirements irrespective of their level of literacy proficiency.

[14] Bermuda, Canada, Hungary, Italy, the Netherlands, New Zealand, Norway, Switzerland and the United States.

These findings give weight to approaches which emphasise the need for action on the demand side of the labour market (e.g. in terms of job design, human resource management) as well as on the supply side (e.g. influencing the output from the education system) in responding to the existence of skills mismatch.

The release of the OECD Survey of Adult Skills data will provide an opportunity to deepen analysis of the phenomenon of mismatch. The data available from the OECD Survey of Adult Skills will allow issues of qualification mismatch to be examined in conjunction with skills mismatch as well as to combine examination of self-reported mismatch with objective measures. In addition, analysis will be able to cover a far wider range of countries than is possible in ALL, for example.

Conclusion

Results and data from the first round of the OECD Survey of Adult Skills will be released in October 2013 with further results for additional countries becoming available in 2016. As a result, this chapter has only been able to describe the content of the OECD Survey of Adult Skills and give some idea of the types of questions that will enable policy makers and researchers to explore and, hopefully, answer. A number of countries in the Asia-Pacific region are participating in the OECD Survey of Adult Skills and will be able to benefit directly from the study. However, the information from the OECD Survey of Adult Skills will be relevant to other countries in this region. The OECD Survey of Adult Skills database will constitute one of the most comprehensive sources of information for analysing issues of the distribution of key cognitive skills as well the factors that are linked to their development and their relationship to economic and social success.

Annex A: How Is the OECD Survey of Adult Skills Conducted?

The OECD Survey of Adult Skills is delivered as a computer-based assessment. The test application (including the background questionnaire and the direct assessment) is loaded on a laptop computer. The background questionnaire is administered by the interviewer. The majority of respondents complete the assessment on the laptop computer under the supervision of the interviewer. Respondents who have little or no familiarity with computers complete a pencil-and-paper version of the assessment that tests skills in the domains of literacy and numeracy only. All respondents, irrespective of whether they take the assessment in the computer or pencil-and-paper format, first take a 'core test' to assess their capacity to undertake the full assessment. Those who 'fail' the core test are directed to the assessment of reading components. Those who 'pass' the core test proceed to the full assessment.

An enhanced pencil-and-paper version of the assessment is currently being developed for use in countries in which the incidence of familiarity with computers is low. This version of the assessment (which covers literacy, reading components and numeracy only) will be administered in Indonesia as part of the second round of the OECD Survey of Adult Skills (see below).

A minimum of 4,500–5,000 adults (16–65 year olds) is tested in each participating country.

Countries implementing the OECD Survey of Adult Skills are required to meet certain technical standards covering all aspects of the study such as sampling, translation, interviewer training, response rates, contact with respondents, scoring and coding and database preparation. Compliance with these standards is monitored. Only data which meets the necessary quality standards is released.

Two 'rounds' of the OECD Survey of Adult Skills are currently being conducted. The first, which started in 2008 and will be finalised in October 2013 with the release of a comparative report and public use data set, involves 24 countries. The second round started in 2012 and will report in 2016 and will involve 10 countries.

Countries participating in the OECD Survey of Adult Skills

Round 1	Round 2
Australia	Chile
Austria	Greece
Belgium	Indonesia
Canada	Israel
Cyprus	Lithuania
Czech Republic	New Zealand
Denmark	Portugal
Estonia	Singapore
Germany	Slovenia
Finland	Turkey
France	
Ireland	
Italy	
Japan	
Republic of Korea	
Netherlands	
Norway	
Poland	
Russian Federation	
Slovak Republic	
Spain	
Sweden	
United Kingdom	
United States	

Annex B: Defining Literacy, Numeracy and Problem Solving in Technology-Rich Environments

Literacy

The domain of literacy is structured in terms of three main dimensions, those of texts, contexts and cognitive operations. The texts that adults are required to read are categorised in the OECD Survey of Adult Skills along three main axes – those of 'medium', 'format' and 'type'. In terms of medium, texts are classified as either 'print-based' or 'digital' texts. Format involves the distinction between continuous texts (in which information is presented in the form of sentences and paragraphs) and noncontinuous texts (in which information is presented in a matrix format, such as tables, charts and forms). Type covers the rhetorical stance of the text, for example, narration, description, instruction and record.

Four broad categories of 'context' are defined in the OECD Survey of Adult Skills: 'work and occupation', 'personal' (which covers home and family, health and safety, consumer economics, and leisure and recreation), 'community and citizenship', and 'education and training'.

Three broad cognitive strategies identified as essential for achieving a full understanding of texts are identified – those of accessing and identifying (locating information in texts), integrating and interpreting (relating different parts of a text to one another) and evaluating and reflecting (linking the content of a text to other, extratextual knowledge and content).

Numeracy

The domain of numeracy is defined in terms of four dimensions: (1) context; (2) response; (3) mathematical content, information and ideas; and (4) representations.

Three categories of context are identified: (1) work, (2) society, and (3) further learning.

Four categories of responses to mathematical information content and representations are identified: (1) identify, locate or access; (2) act upon, use; (3) order, count, estimate, compute, measure, model; (4) interpret, evaluate/analyse, and communicate.

Four areas of content are defined: (1) quantity and number; (2) dimension and shape; (3) pattern, relationships, change; and (4) data and chance.

Six types of representation of mathematical content are identified: (1) objects and pictures; (2) numbers and mathematical symbols; (3) formulae; (4) diagrams and maps, graphs, tables; (5) texts; and (6) technology-based displays.

Numerate behaviour is founded on the activation of several enabling factors and processes: mathematical knowledge and conceptual understanding; adaptive reasoning and mathematical problem-solving skills; literacy skills; beliefs and attitudes; numeracy-related practices and experience; and context/world knowledge.

Problem Solving in TRE

Problem solving in TRE is conceived in terms of three dimensions: cognitive processes, technologies and tasks.

The 'cognitive dimension' includes the mental structures and processes involved when a person solves a problem defined as a situation where a person cannot immediately and routinely achieve his or her goals due to some kind of obstacle or challenge. These include setting goals and monitoring progress; planning; locating, selecting and evaluating information; and organising and transforming information.

The 'technology dimension' covers the devices, applications and functionalities through which problem solving is conducted. These include hardware devices (laptop computers in the case of the OECD Survey of Adult Skills), simulated software applications, commands and functions, and representations (text, graphics, etc.).

The 'tasks dimension' includes the circumstances that trigger a person's awareness and understanding of the problem and determine the actions needed to be taken in order to solve the problem. Ordinarily, a wide range of conditions can initiate problem solving. For instance, a computer user may realise that his or her mailbox is crowded and that a new schema is needed for classifying e-mails. Alternatively, he or she may be faced with a complex issue (such as finding out more about a medical treatment) and decide to look for relevant information on the Web. In test-taking contexts, tasks are more explicitly assigned to participants. They include the question and task instructions presented to test takers, as well as the specific materials and time constraints associated with the test.

Three categories of task are identified: the purpose and the context in which each task is performed, the intrinsic complexity of the problem and the explicitness of the problem statement and task directions given to the test taker.

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Chapter 9
Skills Development Pathways in Asia

Cristina Martinez-Fernandez and Kyungsoo Choi

Skills development is high on the sustainable growth agenda of developing Asian countries. Those Asian countries which depended on their cheap labour and exports for economic growth are increasingly finding that their growth is being limited by the deteriorating terms of trade and vulnerability to other countries' troubles. This was made clear by the recent global financial crisis and the ongoing economic recession in many advanced countries. In the wake of the global financial crisis, developing Asian economies are now adapting their development strategies and taking up the challenge of "rebalancing growth" towards greater reliance on domestic and regional demand (OECD and International Labour Office 2011). These countries are making adjustments to their labour market and social policies for a job-rich and sustainable recovery, albeit to different degrees and within their country-specific situation.

It is in this context that most developing Asian countries are endeavouring to upgrade the skills of their labour force for sustained growth and further job creation, as skill development is a way for these countries to continue their growth and move from a middle-income country to a high-income country. For large economies, such as the People's Republic of China (PRC) or India, this means rebalancing their growth strategy from being dependent on foreign demand towards a greater reliance on domestic and regional demand. But for smaller economies, the prime objective is to move into newly growing industries. Each country has different objectives and adopts different strategies to attain them.

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Asian countries are among the most dynamic economies in the world. As a result of their rapid growth, several countries are experiencing skill shortages in higher-technology manufacturing. As a response, they have ambitious plans for increasing vocational education and training as part of their national development plans. However, it remains to be seen how these plans will be implemented at the local level.

This chapter[1] is divided into three sections: (1) skills challenges faced by Asian countries, (2) strategic approaches to skills development in Asian countries and (3) emerging policy themes. It draws on data and analysis from the following 15 countries: Australia; Cambodia; the PRC; Hong Kong, China; India; Japan; the Republic of Korea; Malaysia; Mongolia; Nepal; Pakistan; Philippines; Singapore; Thailand; and Viet Nam. A full discussion is found in OECD (2012).

Skills Challenges Faced by Asian Countries

The challenges faced by Asian countries are diverse as is their economic development. Some of the skills challenges refer to the following:

1. *Building up a system for training or creating a training market*. Many countries have an outdated system and lack sufficient facilities and equipment or qualified instructors. Several ways for building up the training system are being pursued, such as creating additional training academies, imposing skill levies and using apprenticeship models. A common element is increasing involvement of the private sector.
2. *Reducing skills mismatches and increasing the links between training and industry needs*. As the industry skill demand is quickly upgrading, growing economies are faced with a widening gap between skill supply and demand. Several approaches are taken in this regard. One is the "train the trainers" model. If private sector initiative is weak in supplying training for new skills, the public sector can train and supply instructors for new skills as a public good. The cost is borne by the government or sometimes charged to companies. A second model is to give subsidies to a leading technology company to train not only their own workers but also workers from other small- to medium-sized companies or the unemployed. For example, Mongolia subsidies on-the-job training of the unemployed with its Employment Promotion Fund. The Philippines seeks to strengthen industry education and training linkages with an enterprise-based training system. Thailand provides incentives to companies including income tax breaks granted by the Skill Development Promotion Act of 2002 and has a National Vocational Training Coordination Committee for coordination with the private sector.

[1] We are grateful for inputs from two experts' meetings of the OECD "Skills and Employment Strategies in Southeast Asia Initiative" (ESSSA) held in Tokyo in 2010 and Shanghai in 2011 on integrating skills development strategies.

3. *Upgrading quality of skills training systems and improving outcomes*. There is a need to assure the quality of skills training to create vocational pathways for high school leavers. In countries such as Cambodia, Indonesia, Lao People's Democratic Republic, Mongolia, the Philippines and Viet Nam, despite the high unemployment rate among college graduates, vocational training is not considered as a viable alternative, and high school graduates value academic studies and target white collar jobs unrelated to industry demands. To improve the status of vocational training and attract youth to where there is demand, high-quality and competency-based training is needed. A National Qualification System (NQS) needs to be constructed. Quality assurance and industry ownership in training is often absent in developing countries and administrative problems or conflicts between authorities exist. For example, Pakistan plans to streamline the existing fragmented training system with a focus on centres of excellence. The PRC is setting up a national system of honours and rewards for skills masters in an effort to improve the public's perception of skills training.
4. *Increasing industry participation and ownership*. One of the major weaknesses in developing Asian countries' skills development system is the lack of industry participation and ownership. The vast majority of firms are SMEs, and they hesitate to invest in workers' skills as they lack resources and duration of expected employment relationship is short. On the other hand, public provision can be supply-oriented and fragmented with weak link with demands. Examples of private sector leadership can be found. Indonesia's Malang Migrant Workers Training Centre is a privately owned training centre for female migrants, specialising in domestic work for households in Singapore and Hong Kong, China. The company that runs the centre has branches nationwide and offers training services for prospective migrants to the electronics sectors of neighbouring Malaysia (mostly men) as well. Nationwide, it sends 250 female workers into these occupations abroad every month. In this case, training is an integral part of the company's service provision. Some examples of national strategies for skills development are presented in Box 9.1.

These challenges are interrelated and cannot be addressed in isolation. In practice, this creates the challenge of integrating skills strategies, which requires a dedicated dialogue among different ministries and departments for policy cohesion and coordination. The issues of skills demand and supply, analysed in the next section, allow greater understanding the context to which these challenges apply.

Box 9.1 Examples of National Skills Plans

Pakistan's National Skill Strategy (2008–2013) sets the following four goals:

1. Streamline policy making.
2. Build centres of excellence.
3. Enhance the role of the private sector in policy making, designing and setting standards in training.
4. Improve apprenticeship training systems and provide more flexibility in industries' selection of trainees and the structure of the training.

(continued)

(continued)

Malaysia's Tenth Five-Year Plan (2011–2015), technical and vocational education part:

1. Improve the perception of *technical and vocational education and training* (TVET) and attract more trainees.
2. Develop highly effective TVET instructors.
3. Improve and align the quality of TVET curriculum with industry needs
4. Streamline the delivery of TVET.

The PRC's 12th Five-Year Plan for National Economic and Social Development:

1. Increase upskilling and on-the-job training of skilled workers.
2. Accelerate the development of tertiary industry skilled workers – IT, service sector, etc.
3. Low-carbon and green industry sector skilled workers.

Source: OECD (2012)

Skills Demand and Supply

Skills Demand by Aggregated Sector

Employment trends by aggregated sectors (agriculture, industry and services) highlight the skills demands shifts (see Fig. 9.1). Agriculture is still a significant part of the economy but employment is moving towards industries. Services industry employment is not strong in most Asian countries.

Agriculture. Five of the countries have large agriculture sectors, accounting for over 50% of employment: Cambodia (72.2% in 2008), India (51.1% in 2010), Myanmar (62.7% in 1998), Nepal (76.1% in 2001) and Viet Nam (51.7% in 2006). Large declines in agricultural employment are experienced in Viet Nam (−13.6%p from 2000 to 2006), the PRC (−10.4%p from 2000 to 2008) and Mongolia (−8.6%p from 2000 to 2009).

Industry. Countries with large shares of employment in industry include the PRC (27.2% in 2008), Japan (25.3% in 2010) and Malaysia (27% in 2009), while it is just 8.6% in Cambodia (in 2008). Large declines in employment shares of industry were experienced in the Republic of Korea (−11.1%p between 2000 and 2010); Hong Kong, China (−7.9%p from 2000 to 2009); Japan (−5.9%p from 2000 to 2010); and Malaysia (−5.2%p from 2000 to 2009). Between manufacturing and construction, industry decline were in manufacturing, especially in Australia, the Republic of Korea, Malaysia, New Zealand and Singapore. However, Viet Nam experienced a large bound in industry employment (7.8%p from 2000 to 2006), followed by the PRC (4.7%p, 2000–2008) and Pakistan (2.1%p, 2000–2008).

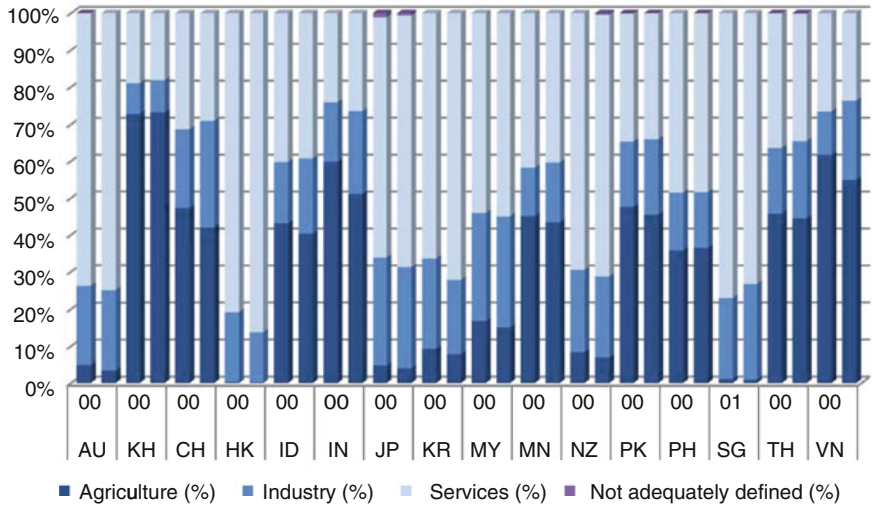

Fig. 9.1 Skills demand in Asia: employment by aggregated sector in 2000 and 2010. Notes: *AU* Australia, *KH* Cambodia, *CH* People's Republic of China (PRC), *HK* Hong Kong, China, *IN* India, *ID* Indonesia, *JP* Japan, *KR* Republic of Korea, *MY* Malaysia, *MN* Mongolia, *NZ* New Zealand, *PK* Pakistan, *PH* Philippines, *SG* Singapore, *TH* Thailand, and *VN* Viet Nam. Data for Singapore from 2001. Data for Viet Nam from 2006; Cambodia, the PRC and Pakistan for 2008; and Australia; Hong Kong, China; Malaysia; Mongolia; New Zealand; the Philippines; Singapore; and Thailand for 2009 (Source: Based on ILO 2011)

Services. Most developed economies have a heavy reliance (over 70%) on service skills including Australia (75.5% in 2009); Hong Kong, China (87.4% in 2009); the Republic of Korea (76.4% in 2010); and New Zealand (72.5% in 2009). Cambodia has the least services employment share (19.2% in 2008). Generally, in the past decade (2000–2010), there has been an overall rise in service employment, with major increases occurring in the Republic of Korea (15.2%p between 2000 and 2010), Malaysia (10.0%p from 2000 to 2009) and Hong Kong, China (8.0%p, 2000–2009). The share of employment in services reduced in the PRC, Mongolia, Thailand and Viet Nam over the last decade.

Skills Demand by Occupation

Examining occupational structures by skills levels shows that, generally, the more developed the country is, the more highly skilled occupations are available, compared to developing countries which seem to rely on lower-skilled occupations. Higher-skilled occupations such as professionals, technicians, associate professionals and clerks are significantly advanced in the developed economies of Australia; Hong Kong, China; New Zealand; and Singapore, while Cambodia,

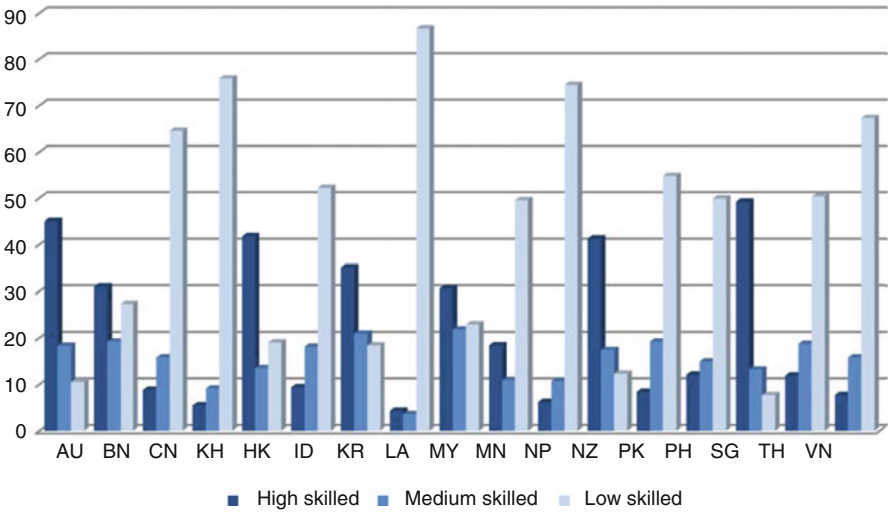

Fig. 9.2 Shares of high-, medium- and low-skilled occupations in total employment. Notes: *AU* Australia, *BN* Brunei Darussalam, *CH* People's Republic of China (PRC), *KH* Cambodia, *HK* Hong Kong, China, *ID* Indonesia, *JP* Japan, *KR* Republic of Korea, *LA* Lao People's Democratic Republic, *MY* Malaysia, *MN* Mongolia, *NP* Nepal, *NZ* New Zealand, *PK* Pakistan, *PH* Philippines, *SG* Singapore, *TH* Thailand, and *VN* Viet Nam. Data for Brunei Darussalam and Nepal is for 2001; the PRC for 2005; Lao People's Democratic Republic for 1995; Malaysia for 2009 and Viet Nam for 2004. For ISCO 88: higher skilled (professionals, technicians and associate professionals, clerks), medium skilled (craft and related trade workers, plant and machine operators and assemblers) and low skilled (agriculture and elementary occupations) (Source: Based on ILO 2011)

Pakistan and Viet Nam are struggling to supply these types of skills (see Fig. 9.2 and Table 9.1 for more details). Figure 9.2 labels craft/related trades and plant/machine operators and assemblers as "medium skilled". In this category, operators and assemblers are generally in the manufacturing sector and industrialised countries have more of these jobs. But the craft and trades category is consisted of diverse skill level workers, and a high share is found not only in Australia but in low-skilled countries as well such as Pakistan and Viet Nam. Figure 9.2 also shows the share of low-skilled agricultural and elementary occupations. As classification into occupations is not always compatible across countries, the shares are given as the sum of the two occupations. Several countries in the region are in a state of low-skill equilibrium. There is a high share of low-skilled workers in Cambodia, Mongolia, Pakistan, the Philippines and Viet Nam. These countries are faced with skills development demands for upskilling.

Occupational structures show the level of skills a country has. The demand for skills training is derived from the need to align skills supply with demand. The change in shares of occupation shows the direction and the magnitude of the shifts in skills demand (see Table 9.1). Nepal and Viet Nam have growing demands for craft/trade and production workers. In Pakistan, Thailand, Viet Nam and Nepal, demands for production workers have increased. On the other hand, demands for

Table 9.1 Change in shares of occupations between 2000 and 2008

		ISCO-88 Occupations								
	Period	1	2	3	4	5	6	7	8	9
Australia	(2000–2008)	−0.4	0.6	0.8	−0.3	1.3	−0.2	−0.5	−1.9	0.6
Cambodia	(2000–2008)	0.1	0.4	0.3	1.0	0.1	−1.2	0.8	−0.7	0.4
Hong Kong, China	(2000–2008)	2.6	1.4	1.9	−2.6	1.5	−0.1	−3.0	−2.1	0.5
Republic of Korea	(2000–2008)	0.1	2.8	1.0	3.0	−2.5	−3.3	−2.7	0.1	1.7
Malaysia	(2001–2009)	0.2	1.4	2.3	0.5	3.4	−2.0	−2.0	−4.4	0.8
Mongolia	(2000–2008)	−0.7	1.9	0.0	0.2	8.1	–	−0.7	−3.3	–
Nepal	(1999–2001)	0.5	2.1	−0.5	0.9	2.7	−10.7	3.4	0.3	1.3
New Zealand	(2000–2008)	0.8	3.9	0.3	0.2	−0.7	−2.0	−0.2	−1.1	−1.3
Pakistan	(2001–2008)	1.7	−0.7	1.1	0.0	0.3	−2.6	0.2	0.7	−0.7
Philippines	(2001–2008)	2.7	0.0	0.0	0.5	1.1	−4.2	−2.5	−0.9	3.4
Singapore	(2000–2008)	1.1	5.5	1.0	−0.9	−1.1	0.0	−2.4	−3.7	0.8
Thailand	(2001–2007)	0.2	0.2	0.7	0.4	1.4	−3.8	0.4	0.4	0.2
Viet Nam	(2000–2004)	0.1	1.1	0.3	0.1	0.2	−0.8	2.8	0.3	−2.9

		ISCO-68 Occupations						
	Period	1	2	3	4	5	6	7/8/9
Indonesia	(1999–2007)	1.2	0.2	−0.7	0.4	0.6	−2.9	1.0
Japan	(2000–2008)	1.6	−0.5	0.3	−0.5	1.9	−0.9	−2.4

Source: Based on ILO (2011)

Notes: ISCO-88 occupation categories: *1* legislators, senior officials and managers, *2* professionals, *3* technicians and associate professionals, *4* Clerks, *5* service workers and shop and market sales workers, *6* skilled agricultural and fishery workers, *7* craft and related trades workers, *8* plant and machine operators and assemblers, and *9* elementary occupations

Data for Indonesia and Japan are in ISCO-68 occupation categories as follows: *0/1* professional, technical and related workers, *2* administrative and managerial workers, *3* clerical and related workers, *4* sales workers, *5* service workers, *6* agricultural, forestry, fishermen, *7/8/9* production and related workers

agricultural workers and elementary occupations have declined. This shift in demand means that these countries need to train unskilled workers from rural areas to become production workers. In the more industrialised parts of Asia, demands for the medium-skilled occupations (craft/trades and operator/assembler workers) have declined fast in economies including Australia; Japan; Hong Kong, China; the Republic of Korea; Malaysia; and Singapore. In these countries, the demands for more highly skilled jobs such as professionals and associate professionals have increased instead. Economies in which the shares of professional and technician/associate professional workers have risen include Hong Kong, China; the Republic of Korea; Malaysia; and Singapore, in varying degrees. However, decline in production jobs is not entirely matched by growth of higher-skilled jobs. In all countries, the shares of elementary occupations have increased. Mongolia and the Philippines have experienced a reduction of craft/trades and production jobs and an increase of elementary occupations. The countries are faced with upskilling demands for a wide range of their unskilled workforce.

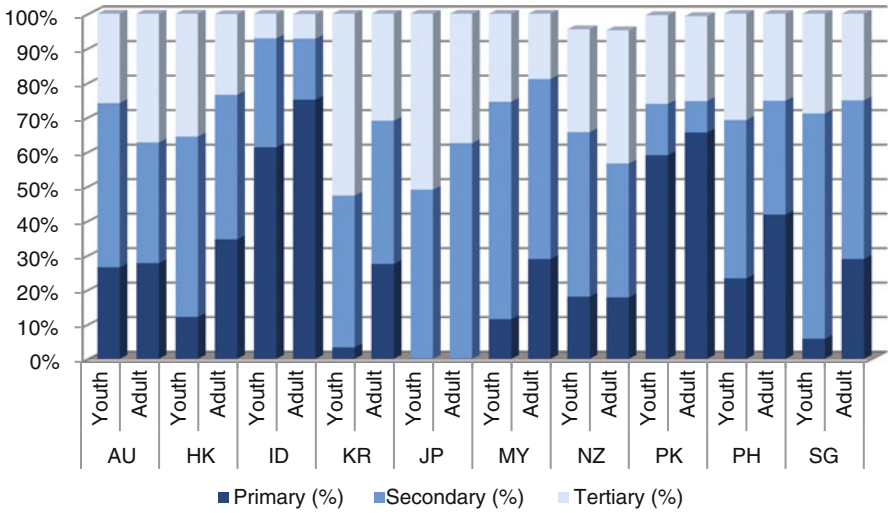

Fig. 9.3 Educational attainment by labour force (age cohort), 2008. Notes: *AU* Australia, *HK* Hong Kong, China, *ID* Indonesia, *JP* Japan, *KR* Republic of Korea, *MY* Malaysia, *NZ* New Zealand, *PK* Pakistan, *PH* Philippines, *SG* Singapore. The "youth" category is aged 15–29 and "adult" aged 30 and over, except for Japan and Singapore where youth is 15–35 years old and adult is 35 and over, and for Australia where adult is 30–64. ILO's *Key Indicators of the Labour Markets* (KLIM) primary level includes ISCED-97 level (1) basic education and (2) lower secondary education; secondary level includes (3) upper secondary, and (4) postsecondary non-tertiary; and tertiary includes (5) first-stage tertiary and (6) second-stage tertiary education. For Japan, "primary" includes secondary. Data for the Republic of Korea is for 2007 (Source: Based on ILO 2011)

Among the medium-skilled occupations of service and sales workers, the patterns are very diverse. Some countries experienced growth in these occupations while in other countries the shares have diminished, which reflects diverse economic conditions of the countries.

Skills Supply

Looking at the labour force by educational attainment (primary, secondary and tertiary) among the youth (15–29 years old) and adults (30+ years) highlights the areas where a more educated workforce is required. Figure 9.3 shows the level of educational attainment of the young and adult labour force in 2008.

Primary Education. The countries with the highest percentage of the labour force with only a primary education include Indonesia and Pakistan; these countries have a significantly high percentage of labour force with either less than 1 year or only preprimary education. These countries have a definite demand for a universal primary education. All countries have experienced a decline in shares of primary

education in their workforce (1998–2008), indicating that workforce education and skills development are increasing. Developed economies that generally experience lower levels of primary education only include Australia; Hong Kong, China; the Republic of Korea; Japan (before 2002 when primary and secondary education levels were combined); Malaysia; and New Zealand. Generally, the higher percentage of primary education only occurs in the adult age group, more significantly in Indonesia (75.1%), Pakistan (65.6%) and the Philippines (41.8%). Indonesia (61.3%) and Pakistan (59.0%) experienced the highest levels of primary education only within their youth (15–29 years old) labour force.

Secondary Education. As Fig. 9.3 illustrates, the economies with the highest level of secondary education attainment in their labour force include Australia; Hong Kong, China; the Republic of Korea; Malaysia; and New Zealand. Countries that are struggling with secondary educated labour force skills include Indonesia and Pakistan; however, these countries are generally experiencing an increase in secondary education attainment. Among the youth labour force, secondary educational attainment dominates in all countries, most significantly in Singapore (63.5%) and Malaysia (63.0%).

Tertiary Education. All countries are experiencing an increase in tertiary educational attainment within the workforce, with some more prominently than others. Indonesia has the lowest percentage of its labour force with a tertiary education, while Australia, the Republic of Korea, Japan and New Zealand have the highest percentage, indicating a highly skilled workforce. Generally, the youth have higher ratios of tertiary educational attainment, indicating a rising skills level across age cohorts. The Republic of Korea (52.7%) has a majority of its young labour force with a tertiary education, followed by Japan (51.0%); Hong Kong, China (35.6%); New Zealand (29.8%); Singapore (28.9%); and Australia (25.9%).

As the tertiary education system varies a lot across countries, a large number of tertiary education graduates do not always equate to an ample supply of new skills in the labour force. Figure 9.4 compares the number of science and engineering graduates as a percentage of the total labour force to measure inflow of new knowledge to existing labour force. In Australia, the Republic of Korea, Malaysia, Mongolia and New Zealand, it is around 0.4% of the total labour force. But in Cambodia, Lao People's Democratic Republic, Nepal and Viet Nam, the inflow of this type of knowledge into the labour force is insufficient, as their colleges and universities do not produce sufficient numbers of graduates in these fields. Countries need to increase the supply of science and technology personnel given their importance to innovation processes, particularly in advanced manufacturing and services industries. The PRC has a great emphasis on science and technical professionals, but unfortunately a comparable statistic is not available. All science and technology workers can be considered "knowledge workers", and calculating their number is a useful way of examining and interpreting the knowledge dynamics of a region (Sharpe and Martinez-Fernandez 2007).

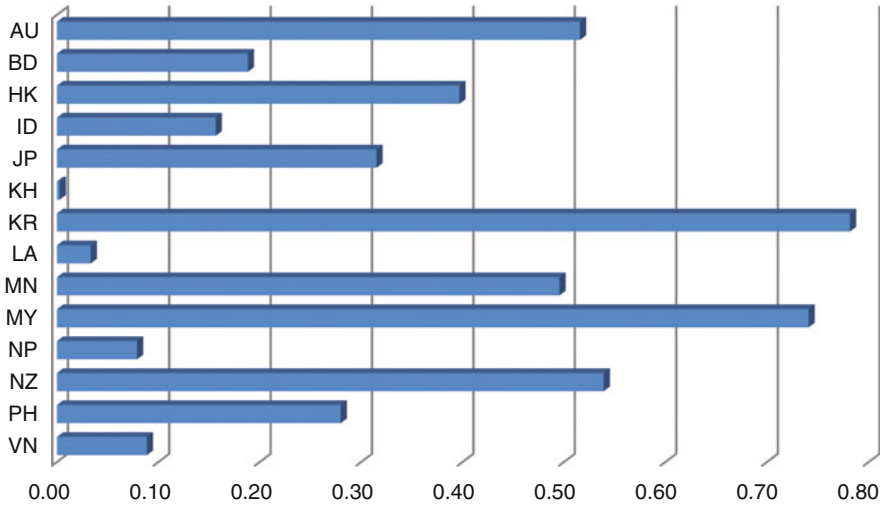

Fig. 9.4 Science and engineering graduates as a % of the labour force, 2009. Notes: *AU* Australia, *BN* Brunei Darussalam, *KH* Cambodia, *HK* Hong Kong, China, *ID* Indonesia, *JP* Japan, *KR* Republic of Korea, *LA* Lao People's Democratic Republic, *MY* Malaysia, *MN* Mongolia, *NP* Nepal, *NZ* New Zealand, *PH* Philippines, and *VN* Viet Nam. Data for Australia and New Zealand for 2006; Hong Kong, China for 2004; Viet Nam and the Philippines for 2008; Nepal for 2010 (Source: Based on graduate statistics from UNESCO, Institute for Statistics, and labour force statistics from ILO 2011, Table 1a)

Strategic Approaches to Skills Development in Asia

There is a mix of approaches to skills development. Most countries are strengthening technical and vocational education with some countries focusing on basic education. This approach is largely driven by public institutions; however, it needs greater investment. More workplace training is needed for high-skilled workers, but above all transition economies in Asia lack the needed market system. Large economies, such as the PRC, have large-scale investments in home-grown technology. India has developed sophisticated high-value technology services significantly leveraging its science and technology systems. At the same time, there are local initiatives for specialised technology and services such as financial talents in Shanghai or SME entrepreneurs' managerial skills in Japan that foster skills and training ecosystems in particular places. Most countries are addressing the skills development needs of the transition to a green growth economy. This section discusses four approaches that are taken by the Asian countries: (1) strengthening technical and vocational education and training (TVET) systems, (2) fostering knowledge intensity through workplace training, (3) developing local skills ecosystems and (4) integrating skills and technologies for green growth.

Strengthening TVET Systems

A strong vocational skill is built upon a background of solid primary education. In several Asian countries, primary education is not universal; hence, its expansion to the whole population is among the primary goals in their human resource development strategy. The PRC views general primary education as a key strategy for equality and has extended a free compulsory 9-year education nationwide in 2008, with priorities given to rural areas, outlying poverty regions and ethnic minority groups to narrow urban–rural and regional income gaps. The PRC invests hugely in education, and its human capital development spending amounted to 11% of total GDP in 2008. The PRC provides financial aids to students in higher education to raise enrolment: 90% of secondary vocational school students and 20% of university students received some sort of financial support.

Expanding vocational education at the secondary education stage is another key strategy in Asian countries. As many students do not complete secondary education, vocational education is viewed as a desirable option in raising their skills and in promoting equality. But a common impediment is the existing negative perception towards vocational education as a second-class education and the consequent low participation rate. One of the reasons for poor employment outcome is the weak link between vocational education and labour market. Diverse policy measures are taken to overcome this perception and provide incentives for the youth to choose vocational education.

In Cambodia, technical and vocational education (TVE) is a strategy for integrating the youth, especially in rural and poverty areas, and having them contribute to the social and economic development of the country. Its nationwide enrolment rate in basic education is high at 94.8%, but the enrolment rate at the lower and upper secondary education is very low at just 31.9 and 19.4%, respectively. The dropout rate is high at 18.8% in the lower secondary and at 11.3% in the higher secondary education. Cambodia believes that expanding TVE with a solid link to labour markets will contribute to social stability, inclusion, poverty reduction and sustainable economic growth, and the Education Strategic Plan for 2009–2013 of the Ministry of Education, Youth and Sport (2010) states technical and vocational education expansion at the secondary educational level as a major policy objective. But the challenges are its high cost and the existing low perception towards TVE. To resolve these problems, Cambodia seeks to diversify TVE provision gradually with higher private sector participation, employers' investment and multilateral involvement. To improve the public perception and low demand for TVE, several steps are being taken, such as institutional capacity building and quality improvement before quantity expansion.

Pakistan is faced with a similar problem. Compared to general education, vocational training has been relatively neglected and is fragmented and supply-oriented. Pakistan is trying to transform itself from a middle-income to a high-income country through a human capital development strategy entitled "Skilling Pakistan", and it is faced with the following issues in its TVET system: (1) due to the low perception and

low quality of training education, students do not consider training as a viable and mainstream alternative, and enter the labour market with low skills; (2) industries' general perception of the quality of technical/skills education is low and a shortage of skilled labour is listed as one of the major constraints for investment; and (3) employees' low expectations of the prospects of technical/skills education courses and hence their low take-ups.

The South Asian countries of Bangladesh, Nepal, Pakistan and Sri Lanka have particularly high youth unemployment, despite the region's economic growth surge last decade. In these countries, overseas employment is an important option for the youth. In order to prepare them for a gainful foreign employment, they need a skill development programme targeted at the unemployed youth, with a systematic planning, foreign market surveys, information on foreign employment systems and identification of needed skills.

Malaysia considers quality improvement as the key element in increasing enrolment in technical education and vocational training (TVET). Malaysia adopted the following four strategies in its Tenth Economic Plan (2011–2015) to widen broaden the access to quality TVET: (1) improve the perception of TVET and attract more trainees, (2) develop highly effective TVET instructors, (3) upgrade and align TVET curriculum with industry needs and (4) streamline the delivery of TVET.

Thailand has set the policy goal of "No youth entering the labour market without proper skills training by 2020". The country has a large-scale training system for the youth. As of 2007, about 1.5 million students were in diverse training institutions under the Ministry of Education.

Fostering Knowledge Intensity Through Workplace Training

The other problem faced by Asian countries is increasing knowledge intensity and skills development in the workplace. Asian countries commonly have a large share of unskilled and semi-skilled workers. To move out of a middle-income trap to a higher value-added production and towards a sustained growth path, workplace training is becoming a key agenda item. Skill shortages are becoming an impediment for their sustained growth, and countries are seeking to upskill their labour force through workplace training. A common problem in promoting workplace training is the low-skill investment of the industries. To overcome this problem, several countries have introduced incentives including tax exemptions for training costs to promote workplace training.

Malaysia uses the Tenth Plan period (2011–2015) to revamp its educational system to significantly raise students' skills to increase their employability. Currently, the workforce in Malaysia remains relatively unskilled, with 77% of the labour force with only up to 11 years of education and with only 28% of the jobs in the higher-skill bracket. The Economic Planning Unit's baseline scenario projects that this share will reach 32% by 2020. But for Malaysia to be on par with high-income regional peers such as the Republic of Korea, Singapore and Taipei,China,

this target would need to be increased to 35%. The government aims to increase this share to 33% by 2015. Achieving this goal requires greater involvement of the private sector. The government will expand the coverage of the Skills Development Fund to promote upskilling and retraining workers. The coverage will be extended beyond school leavers to include existing workers, and preferential loans will be provided to pay for workers' costs incurred in skills upgrading. The Recognition of Prior Learning (RPL) programme will be expanded and grant the Malaysian Skills Certificate to workers who do not have any formal certification but who have obtained relevant knowledge, experience and skills in the workplace to enhance their career prospects as well as to encourage and reward lifelong learning among the workforce.

In the case of Viet Nam, although it is an export-oriented economy, the impact of the global financial crisis upon its exports has been modest. However, Viet Nam faces enormous training demands. Among its approximately 50 million labour force, 33 million (65%) are unskilled workers. The addition of five million jobs in industry and the services sector between 2005 and 2009 barely affected the rural area primary sector. The share of the primary sector in production has remained at around 20% during the last decade with a labour force of 24 million. Along with structural development, workforce training constitutes a key element in the country's employment growth strategy. Viet Nam takes a two-pronged approach: higher education reform to mitigate the shortage of skilled professional workers and a workforce vocational training programme to create jobs. The government approved training programmes, which cover one million trainees annually during 2010–2015, and target the youth, textile and garment industry workers, and women. For higher education reform, the programme focuses on improving the quality of universities. The reform programme aims at more autonomy and more accountability and improved funding for universities, as well as training 20,000 faculty members up to doctoral level qualifications by 2020.

In Thailand, the very large agricultural sector accounted for 41.5% of its workforce in 2010. Employment in industry is 19.5% but signs of manufacturing sector adjustment in labour intensive industries have already begun to appear as employment growth is stagnant in that sector. In response, the government plans to support higher-technology skills training in order to facilitate an industrial transition. However, a great majority of the country's enterprises are SMEs with a high employment share but with a small output share and without a proper capacity for providing training. About five million workers are in training programmes managed by the Ministry of Labour, with additional two million workers in other ministries' programmes. Within the programmes, private sector training accounts for about 5.3 million places or 74% of total training. The Thai Government issued the Skill Development Promotion Act in 2002 to promote workplace training with a combination of compulsory measures and incentives. The act encourages enterprises to establish themselves as training providers and conduct skills training in the workplace. An income tax exemption is provided to cover the cost of the training. In 2010, about 2.4 million workers were enrolled in enterprise training programmes.

Mongolia has been faced with a widening mismatch between the training provided by existing public training institutions and the industry skills demand.

The existing public training institutions lack resources and capacity, while skills demand is rapidly upgrading. Small- and medium-sized enterprises are often unable or unwilling to provide their workers with sufficient training. To make up for the deficient skills training and to facilitate a flexible and quick upgrading of skills under a competitive market environment, the Mongolian Government encourages and subsidises on-the-job training in enterprises for the unemployed with its Employment Promotion Fund. Trainees are provided with 4 months of production site training paid for by subsidies that cover the training expenses. For the employers who offer the on-the-job training for the unemployed, the training cost is reimbursed. In the construction industry, 3,000 unemployed were trained and 80% of them landed at jobs in 2009. The services sector and entrepreneurship training is conducted in business centres.

The skills demand in Cambodia's is for low-skilled workers, and this demand reinforces the current low-skills equilibrium in the country. Besides boosting economic growth, the Royal Government Cambodia (RGC) may well need to help firms move up-market in terms of product market strategy, technology uptake, innovation and skill need and usage, in order to break the current low-skill equilibrium. For example, the garment industry currently requires new technology to underpin its longer-term sustainability. The focus on demand-side skills and labour market issues are designed to support the skills upgrading and utilisation processes that are required in Cambodia in order to underpin the Supreme National Economic Council's (SNEC) pending industry development policy. The industry development policy should strengthen economic growth by providing the right business environment and incentivising local industry to grow through adopting higher-order product market strategies and sound business improvement practices. Business improvement practices must address optimal development and deployment of labour as such behaviour is the essence of demand-side skills and labour strategies. Integrated and balanced skills and labour strategies could include (1) mobilising national initiatives, (2) supporting local skills upgrading and employment initiatives and (3) dealing with infrastructure for employment and training programmes (Eddington 2012).

In Japan, SMEs employ 74% of total manufacturing employees, but job creation is not active. Under the current global business environment, not only large multinational corporations but local SMEs as well are increasingly influenced by the sophisticated global value chains helped by information technology (IT) and free trade agreements (FTAs), including economic partnership agreements (EPAs). Many multinational corporations' FDI destinations are geared towards where there are reliable supporting industries, which are mostly made up of SMEs. And in such cases, specialised SMEs can readily make up a part of the global value chains. Furthermore, in rapidly growing middle-class markets in Asia and other emerging economies, product specifications need to be strategically defined, in which specialised SMEs can be better integrated into the global value chains. In addition, SMEs are less affected by the impact of the crisis and can serve as an important job creation engine in such situations. Just after the financial crisis hit the world, what most countries witnessed was an evaporation of liquidity for financing SME

business activities. Therefore, securing access to financing (working capital as well as investment capital) for SMEs are crucial. In the past, to facilitate growth and innovation, government policy for supporting SMEs' access to financing tended to focus on investment capital. However, amid the current crisis, not only investment capital but also working capital is essential for their survival. More specifically, the current crisis epitomises that SMEs need to know how to secure capital, especially working capital, under a tight capital market. SMEs tend to lack reliable documents for financing purposes, not to mention detailed business plans, future projections, etc. In this context, SMEs need to be equipped with knowledge on financing, and this should be included in the skills list needed for SMEs.

The share of micro-, small- and medium-sized enterprises (MSMEs) is large in the Philippines, accounting for 70% of total employment, 30% of total sales and value-added in manufacturing and 25% of total exports. The demand for training in the Philippines is twofold: the existing and potential entrepreneurs need business skills and knowledge to be competitive in the world market, particularly in financing, marketing, technology and human resources development, and the MSME workers need to be trained for skills required in technology-intensive industries and for improving productivity. The needs are even higher for smaller MSMEs. However, employer-provided training is very limited and the following constraints have been cited: insufficient access to finance, poor information on training needs, low perception of formal training and lack of training facilities. The government and the education and training institutions, both public and private, are the major providers of the needed skills training for the MSMEs, in which the Technical Education and Skills Development Authority (TESDA) is the lead government agency for managing TVET.

Developing Asian countries commonly face a lack of skills development in SMEs, especially internal training, a focus which is not well developed by donor agencies either, whose efforts tend to focus much more on physical infrastructure development (Usui and Martinez-Fernandez 2011). However, lack of training in SMEs is not confined to developing countries, and many OECD countries face similar problems (OECD forthcoming). In Australia, small firms with less than 20 employees constitute the vast majority of businesses, and nearly two thirds of them are very small, microbusinesses with 1–4 employees. They collectively employ nearly half of the workforce (48% in June 2009), with another 23% of employed people working in medium-sized businesses with 20–199 employees. But small businesses are less likely to use formal (nationally accredited) and structured training than larger firms and more likely not to train their staff at all. Small businesses tend to respond that their staff already have adequate skills or more skills than needed, indicating that many small businesses are not seeking growth or change. However, even in small firms, training is often associated with innovation, growth or restructuring, and training programmes need to be tailored so that they favour and engage the demands of small businesses. Small- and medium-sized businesses are more likely to report skill shortages as a factor hampering innovation than larger ones. As small businesses are more likely to be locally owned, they are less able to draw on expertise from outside. Recently, small- and medium-sized

innovating firms are reporting more difficulties accessing suitable skills compared to larger firms. The gap on this issue is larger than for any other barriers such as access to funds for innovation, and it appears to have widened during the last decade. In order to better connect small businesses with formal and structured training and to link them with innovation, Australia undertook the National Skill Ecosystem Programme in the early 2000s which was based on firms in an industry or region working together on a skill and workforce issue. In the programme, businesses take more responsibility for the training and development of their own workforces, but also they work with outside experts such as research and educational institutes for new ideas and approaches.

The PRC's long-term human resources development strategy in the new century puts a great emphasis on high-quality science and technology personnel. The PRC plans to produce an enormous amount of high-quality and professional science and technology human resources as outlined in several of its national plans for the 2000s, such as the Tenth Five-Year Plan for National Economic and Social Development (2001), The Guidelines on National Medium- and Long-Term Program for Scientific and Technological Development, 2006–2020 (2006), The National Outline for Medium- and Long-Term Talent Development, 2010–2020 (2010a) and The National Plan for Medium- and Long-term Education Reform and Development, 2010–2020 (2010b). To become an innovation-led economy, the PRC has launched various high-tech R&D and basic science research programmes and centres at the national level, and established science and research foundations. In addition, the government invests in upgrading technical professionals. In 2008, the PRC had about two million R&D personnel, three times the number in 1991.

Developing Local Skills Ecosystems

Local skills ecosystems include organisations, institutions and firms in a certain local area or labour market that constitute area-based partnerships for training and skills development (OECD forthcoming). There are many advantages in putting more emphasis on devolving more responsibility and resources for partnership development to the local level. In addition, in Asia there is an increased need for flexibility and adaptability in skills development and the changing modes of skill acquisitions. Skills have traditionally been acquired through schools and vocational education systems and passed on through family or community networks. However, increasingly more skills are acquired from multiple sources including workshops, short courses, online, on-the-job and learning by doing. Skills are increasingly developed through face-to-face communication, particularly taking into account local cultural and socio-economic characteristics. Hence, local skills partnerships are not just for providing skills, they are for knowledge exchange as well. Local partnerships in training have advantages in that local agents are better able to develop skills that meet their specific needs, increase knowledge flows and information within communities, drive local innovation through new ideas, utilise local

knowledge, develop capabilities and skills and common ownership, increase transparency and accountability, and supplement limited resources of the formal education and training system.

However, there are many challenges in designing and promoting local partnerships. More trust has to be consolidated in market relationships, and it has to be sustainable as the returns tend to be over the longer term. The objectives for local partnerships have to be clear from the start, and cooperation and the balance of power has to be secured. In many ways, the role of centralised agencies is increased through local partnerships. For example, in education and training, central agencies can contribute by providing the policy, regulation and planning framework for local initiatives, by supporting local partners with information and forecasts, curriculum development, quality and accreditation assessment, evaluation and monitoring, and funding for the local partners to meet the agreed funding criteria.

As an example, Thailand's skills training strategy emphasises local initiatives. Thailand's regional offices are equipped with the capacity for designing and developing training curricula and the network for training, and training can be provided more efficiently thanks to the flexibility they are granted. Budgets for partnerships are given as a lump sum according to the regulations of the authority.

A more integrated and robust example of fostering local skills ecosystems is the decision of the PRC Government in 1992 to speed up the process of developing Shanghai into an international financial centre in response to increasing economic globalisation and global financial competition. A serious bottleneck was the lack of competent financial talents in the city. To resolve the manpower problem, the municipal government of Shanghai decided to invest in the following areas: (1) to develop local financial talents, (2) to recruit high-level overseas financial talents and (3) to improve the environment for the talents. To nurture local financial talents, Shanghai built a sound system for developing financial talent including improved curricula at universities, high-end professional training and internal training within financial institutions. In 2010, four top-notch universities were designated as training bases by the municipal government, and financial institutions are advised to cooperate with them for training. Shanghai built high-level financial training bases with international standards relying upon foreign universities and financial institutions. Firms are encouraged to train their employees abroad. The knowledge and capabilities of existing executives at financial institutions were updated through executive MBA programmes in top business schools, outbound programme training and knowledge updating programmes.

To facilitate the recruitment of high-level overseas talents, the Shanghai municipal government launched programmes for attracting 10,000 overseas Chinese talents in 2003, the Shanghai Pujiang Talent Programme in 2005 and the Young Talent Returning Programme in 2008. Shanghai cooperates with many overseas Chinese organisations for recruiting financial talents. The municipal government recommends recruiting overseas talents at senior or key positions and supports system changes favourable to overseas talents. City officials make regular visits and communicate with the overseas talents to better meet their needs.

Finally, to create a comfortable living and working environment for the financial talents, Shanghai provided them with career development opportunities, preferential policies, and services and cultural and living facilities. The municipal government endeavoured to invite Chinese and foreign financial institutions to locate their headquarters or regional headquarters in Shanghai. Many preferential policies were enacted in terms of healthcare, education and credential handling procedures for their children, and their residential and taxation status.

As a result of the city's efforts, the size of financial industry employment in Shanghai jumped from 130,000 in 2000 to 231,900 in 2010. The financial industry has now grown beyond the banking business to securities, insurances, futures and trust. According to the Chinese Academy of Social Science's global financial centre rankings of 2011, Shanghai is ranked as the fifth most competitive among the 75 global financial centres along with Tokyo, following London; New York; Hong Kong, China; and Singapore.

Integrating Skills and Technologies for Green Growth

Asian countries perceive the move towards a green economy both as a new challenge and a new opportunity. Several countries in the region have very large carbon dioxide footprints, and the transition mandates revising their planned growth strategy. At the same time, they also aim to join one of the world's hub countries in new technology. Innovations and advent of new technologies offers them an opportunity to join the technology leading countries in the world.

Many Asian countries are setting up ambitious targets and responding proactively to the transition. The Republic of Korea announced its National Strategy for Green Growth in 2009, which set up an ambitious goal of raising the share of new and renewable energy from 2.7% of 2009 to 2.8% by 2013 and to 6.1% by 2020. It aims to join the World's 7 Green Powers by 2020. Singapore has set up a carbon emission reduction goal of 7–11% from the BAU (business as usual) level by 2020, which can be extendable to 16% if a global agreement is reached. Singapore developed a national framework for sustainable growth in 2008, documented in the "Sustainable Singapore Blueprint", according to which energy efficiency will be raised by 35% from its 2005 level by 2030. The Energy Conservation Act is expected to take effect in 2013 and will require companies with large energy consumption to appoint an energy monitor officer and report energy use to the National Environment Agency (NEA) and submit improvement plans to improve energy efficiency. Australia demonstrated its commitment to build a stronger and greener economy by developing policies that will boost green collar jobs, such as energy efficiency strategies for buildings and industry, rapid expansion of clean energy infrastructure, structural reform of emission-intensive industries, a cleaner vehicle fleet and public transport infrastructure plan; and targeted regional investment and industry planning.

Aside from such national level issues, achieving a green economy requires a diverse range of workers with broad skill sets, not only technology and R&D professionals but also workplace skilled workers who can cope with the skilled demand shifts.

Singapore is focusing on green technology personnel: the Building and Construction Authority estimates that at least 18,000–20,000 "green specialists" are required by 2030 in the building sector. The Environment and Water Industry Programme has allocated SGD 470 million to promote research and development in water sector including manpower development and commercialisation of technology. The Singapore Business Federation predicts an increasing demand for sustainability professionals like engineering or audit professionals and is working with universities and research institutes to address the skills demands.

In Australia, the move to a low-carbon economy is expected to create thousands of extra jobs, as well as the recreation of hundreds of thousands of existing jobs. The reskilling, cross-skilling and upskilling of new work practices and workers are needed, and this can provide a window of opportunity for the disadvantaged group. But to grasp this opportunity, educating communities should be able to ensure candidates to obtain the training necessary to gain sustainable employment in the green collar sectors. Australia tries to achieve this through integration of the school system, VET system, trade colleges and universities. The National Green Skills Agreement between the federal, state and territory governments seeks to build up the capacity of the VET sector to deliver the skills required in the workplace and to enable individuals, business and communities to adjust to and prosper in a sustainable, low-carbon economy. Included in the agreement is the review and revision of training packages to incorporate skills for sustainability, development of national standards of sustainability practice and teaching in vocational training, the upskilling of VET practitioners so that they could offer quality in skills.

In the Republic of Korea, the green growth is a part of the economic stimulus programme to overcome the effects of the worldwide recession. Out of the total USD38 billion stimulus package, 80% was assigned to environmental projects such as fresh water, waste control, energy efficient buildings, renewable energy, low-carbon vehicles and rail network systems. In the medium term, the government is focusing on public credit guarantees for green technologies and industries and introducing a carbon emission trading system and tax incentives for energy saving. The total budget for the green initiative was set at 2% of GDP for 2009–2013. On the human resources and social policy side, the transition requires human resources development for green technology R&D, retraining existing workers for green technology and a new system of active labour market programmes for displaced workers as well as a new social safety net for them.

For the less-developed economies, green growth is a challenge in their development path because it could mean a widening knowledge gap and slowdown in growth as the introduction of mass production becomes harder. The implication of not catching up with the green growth trend could be increased poverty and job insecurity. Countries such as India and Thailand feel the need for a more proactive

policy and public and private investment expansion to close the skill gap and to monitor progression in low-carbon technologies. On the training side, the transition to low-carbon growth poses two challenges: the countries do not have sufficient skilled manpower for green jobs, and they have retraining demands for those affected by skills demand shifts.

Thailand puts more emphasis on manpower training in green jobs, understanding that green growth would intensify skills demands in the area and the green training would become a crucial element in future human development. For policy implementation, it extensively uses the Skill Development Promotion Act of 2002 which covers the cost of private enterprises' green training by means of corporate income tax reduction. Along with the training expansion, Thailand seeks to introduce measures and systems for an extended social safety net.

India has incorporated the sustainable growth process as a focal area in its growth strategy plan within the 12th Five-Year Plan of 2012–2017. The strategy covers areas of agriculture, waste management, energy, transport, and services and addresses mapping of skills, creating a registry of skills, infrastructure for skill development and involvement of the private sector and civil society in skill building. India's policy focus is on a sustainable and inclusive growth strategy, as the adoption of greener technology would affect the labour market in terms of change in occupational structure as well as associated skill levels. Low-carbon growth is expected to create millions of (green) jobs in India in different sectors, requiring different skill sets and competency levels which may or may not exist in the current skill structure. However, no comprehensive training plan has been elaborated. Lower-level skills training is carried out by local governments, but industry linkages with the training institutes are weak, and efforts are underway to upscale the initiatives through sector skill councils. Although new higher-level skills in relation to new green occupations are not yet available, they are being developed at diverse universities and research institutes with government financial support.

Summary

Asian countries are utilising different strategic approaches to skills development. (See Fig. 9.5.): (1) strengthening technical and vocational education and training (TVET) systems, (2) fostering knowledge intensity through workplace training, (3) developing local skills ecosystems and (4) integrating skills for green growth.

Strengthening TVET and secondary education systems requires a shift from curricula-based approach to competency-based training and creating a demand-driven training system which is responsive to industry needs. Corrective measures are needed, among others: (1) streamlining policy making and reorganising the current procedural overlaps among institutions, (2) setting up sector-specific centres of excellence, located in proximity to relevant industries and (3) institutionalising industry's role in policy making.

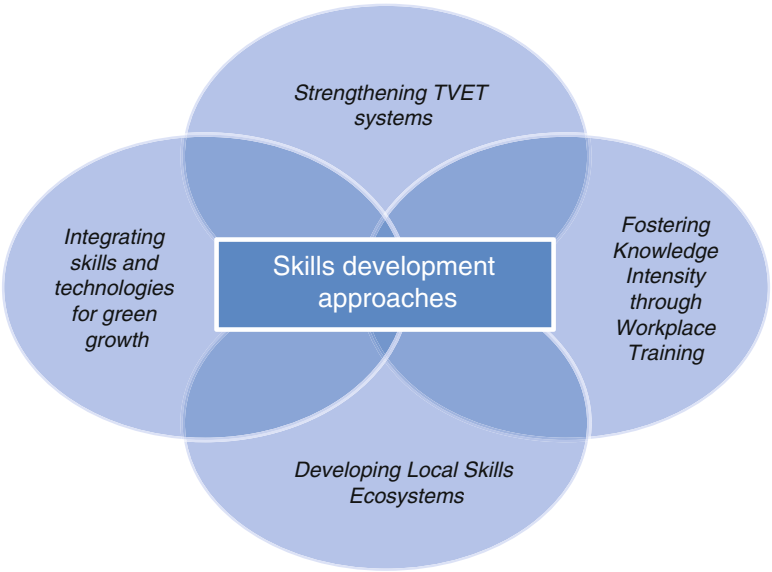

Fig. 9.5 Skills development approaches in Asian countries (Source: OECD 2012)

Workplace training in most Asian countries lacks a well-developed training infrastructure at the institutional level. Therefore, developing firms' capacity as training partners or training organisations is a pathway that can be faster and more sustainable for increasing the level of skills and the level of knowledge intensity in firms. In particular, SMEs are suffering the most from the struggle on skills development and the skills gaps they experience. Ultimately, increasing firms' level of knowledge intensity increases innovation and productivity for innovation and commercialisation which pushes workforce skills development internally and is directly related to the production pathway of the firms (Martinez-Fernandez et al. 2011).

Local skills and training ecosystems can provide a network mechanism for vocational training coordination by involving more industry in training, better placing trainees in firms and providing improved incentives for training that better respond to the market in terms of satisfying employers' changing demands. The impact of developing local skills ecosystems and fostering local skills initiatives is less known in Asian countries but some examples of integrated strategies driven by national authorities have had successful results, e.g. Shanghai finance skills strategy.

Green growth has become an opportunity for many Asian countries to integrate their skills strategies and connect into global development networks for new technologies and the development of green sectors. Not all countries can invest at the same level. For some countries, just raising awareness among their training systems and firms is the most feasible strategy; for others, strong investments in their science and technology systems and skills and training systems are linked to job creation and sustainable development.

Emerging Policy Themes

The skills development programmes and policies analysed in this report indicate four levels of policy concern for a more integrated approach to skills development. The first level refers to "skills infrastructure and governance". The second level refers to "the composition of the skills and jobs" as they relate to current employment. The third level refers to "the knowledge intensity in the workplace". And the fourth level refers to "integrating skills strategies at the local level".

More Investment in Skills Infrastructure and Governance...

Asian countries face common challenges of building up skills infrastructure for creating a training market with quality suppliers, reducing skills mismatches, improving links between training and industry needs, upgrading outdated training systems and increasing industry participation.

If public training systems are outdated and the elements of a training market are weak, the transition to the knowledge economy and the higher value-added to the dominant sectors will happen at a slower pace. Including those in the nonformal sector is also more difficult if governance of the skills system is not clear or well articulated in partnership with the private sector.

...While Addressing the Composition of Skills and Jobs

Not much attention has been devoted to the development of knowledge workers in Asia. The higher-skilled occupations such as professionals, technicians, associate professionals and clerks are significantly advanced in the developed countries of Australia; Hong Kong, China; New Zealand; and Singapore while Cambodia, Pakistan and Viet Nam are struggling to supply these types of skills. Several countries in the region are in a state of low-skill equilibrium, particularly in Cambodia, Mongolia, Pakistan, the Philippines and Viet Nam. These countries are faced with skills development demands for upskilling. The shares of more highly skilled jobs such as professional and associate professionals have increased in most economies but the share is larger in the Republic of Korea; Hong Kong, China; Malaysia; and Singapore.

The countries that have the highest percentage of their labour force with a primary education only include Indonesia and Pakistan. These countries have a definite demand for a more educated labour force. The economies with the highest level of secondary educational attainment by their labour force include Australia; Hong Kong, China; the Republic of Korea; Malaysia; and New Zealand. Countries that are struggling with insufficient secondary educated labour force skills include

Indonesia and Pakistan; however, these countries are generally experiencing an increase in secondary educational attainment. Indonesia has a very low share of labour force with *science, technology, engineering and mathematics* (STEM) tertiary education, while Australia, Japan, the Republic of Korea and New Zealand have the highest percentage of labour force with a tertiary education, indicating a highly skilled workforce. In Australia, the Republic of Korea, Malaysia, Mongolia and New Zealand, new STEM graduates supply is approximately 0.4% of the total labour force each year. But in Cambodia, Lao People's Democratic Republic, Nepal and Viet Nam the inflow of these types of knowledge into the labour force is insufficient, as their colleges and universities do not produce sufficient numbers of graduates in these fields.

. . .*Promoting More Knowledge Intensity in the Workplace*

Private sector development, both in the formal and non-formal sectors, strongly depends on raising the skills of the large share of unskilled and semi-skilled workforce. To move to higher value-added production and towards a sustained growth path, increasing the level of workplace training and the quality of training is becoming a key issue. A common problem in promoting workplace training is the low-skill investment of the industries. Less is known about how to increase knowledge intensity in the workplace as a way to address the needs of skilling professionals, firms and clusters in high-growth enterprises and industries. This is an urgent need both in countries in high-skill equilibrium and in countries presenting low-skill equilibrium so as to support those firms and sectors that are already embedded in global value chains and technological innovation networks.

A particularly notable case is the need of the SME sector to know how to secure capital, especially working capital, in a tight capital market situation. SMEs tend to lack reliable documents for financing purposes, not to mention detailed business plans and future projections. In this context, SMEs need to be equipped with knowledge of sophisticated financing, and this should be built in in different ways for firm training. There are alternative ways for skills development and knowledge-intensive service activities already well utilised in OECD countries (OECD forthcoming), but how they relate to developing countries has still not been investigated.

. . .*And Integrating Skills Strategies at the Local Level*

Asian countries are developing skills plans as national strategies and frameworks. In most cases there is little specification of how the plans will be implemented at the local level where they need to reach the workforce, firms and organisations. Some countries are now realising the advantages of developing local skills ecosystems

and therefore integrating the local implementation into policies and programmes. However, this focus is more often stated in the most advanced countries.

Skills development for transition to a green growth economy presents a useful example because for green growth, strategies for local skill development can be separated from the higher dimension national level policy. On a national level, it is about setting the right prices and guiding the direction of investment (OECD 2009), but on the local level it is about training and job placement in a changing environment (Martinez-Fernandez et al. 2010). The cases of the Republic of Korea and Thailand show the importance of the establishment of national strategic policy related to sustainable development and climate change. Without such strategic direction and investment, and without adjusting to the "right" prices, small- and medium-sized enterprises tend to hold back on "greening" activity, reporting that they do not know what to do or how to proceed, as is the case in Australia. For a "green" jobs skilling initiative, multiple stakeholders are involved in establishing industry development and skills development plans. The latter is essential to ensure that demand for new "green" skills and supply are balanced and strategically timed. Skills are wasted if they are supplied before industry is ready to use them, a situation which could lead to skill migration from the region.

For the local training dimension, collaboration and flexibility are critical. As in other skills development, "green" skill development must add value to workforce capacity in a meaningful way, and it seems to work best when a regional/cluster approach is taken that fosters collaboration amongst multiple stakeholders. Investment is less effective when skills are provided in an isolated policy silo so facilitating skills and training ecosystems at the local level provides an invisible skills infrastructure that largely reaches stakeholders in connected activities to build capacities in human capital.

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Chapter 10
Public–Private Partnership to Meet the Skills Challenges in India

Dilip Chenoy

Abbreviations

AICTE	All India Council for Technical Education
BCG	Boston Consultancy Group
BFSI	Banking and Financial Services Industries
CII	Confederation of Indian Industry
ITI	Industrial Training Institutes
ITC	Industrial Training Centres
MLE	Ministry of Labour and Employment, India
MHRD	Ministry of Human Resource Development, India
MSME	Ministry of Small and Medium Enterprise
NASSCOM	The National Association of Software and Services Companies
NCEUS	National Commission for Enterprises in the Unorganized Sector
NCVT	National Council for Vocational Training
NSDC	National Skill Development Corporation
NSDCB	National Skill Development Corporation Board
NVEQF	National Vocational Education Qualifications Framework
SSC	Sector Skill Council

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Background: Skills Challenge in India

In today's global economy, skills and knowledge are the driving forces of economic growth and social development for any country. Countries with higher and better levels of skills adjust more effectively to the challenges and opportunities of the world of work. It is also an acknowledged fact that the world population is ageing fast. By 2040, the global population aged 65 and above is expected to reach 1.3 billion – more than double of 530 million in 2010. This trend is expected to result in severe labour shortages across the world.

India, home to the second largest population in the world, has the distinct advantage of having one of the youngest populations globally. Statistically 49.9% of India's population would be below 29 years in 2021, leading to the possibility of 650 million people (a large number of them English speaking) being in the employable age of 15–59 years in a decade from now meeting the requirements of both the domestic and world economies.

Goldman Sachs predicts that India would become the third largest economy in the world by 2035, just behind the United States and the People's Republic of China. Globally, companies have their eyes set on India as a rapidly growing nation that is full of opportunities. The sheer scale of development and consequent domestic demand generated could drive growth for many years.

The labour market in India is undergoing a dynamic change. It is expected that over the next 15 years, 365 million people will be eligible to join the workforce. Over the next decade and a half, 11–13 million people are expected to look for employment opportunities each year (Government of India 2009).

Despite this huge labour pool, however, employability continues to be a major concern in India mainly due to the absence of a proper linkage between the formal education system and vocational training. High school dropout rates (up to 56.8%) and low turnout at the vocational training institutes add on to the challenge. Today, a mere 2% of the Indian workers are formally skilled. In-service training is received by only 15% of workers in the manufacturing sector. A significantly large bulk of the labour force in India – about 93% – works in the unorganised sector, without any formal training (Government of India 2007) (Fig. 10.1).

Fortunately, skill development has now become a key policy issue, with there being a renewed push on existing schemes by the central and state governments, and more importantly, the National Skill Development Mission taking on the ambitious target of skilling and upskilling 500 million people by 2022 in India.

Winds of Change

Skill development initiatives in India have traditionally been led by the government, starting with the establishment of the Industrial Training Institutes (ITIs) in the early years of post-independent India to provide skilled manpower for meeting the needs of the country's fledgling industrial sector. Initially, they were run by the

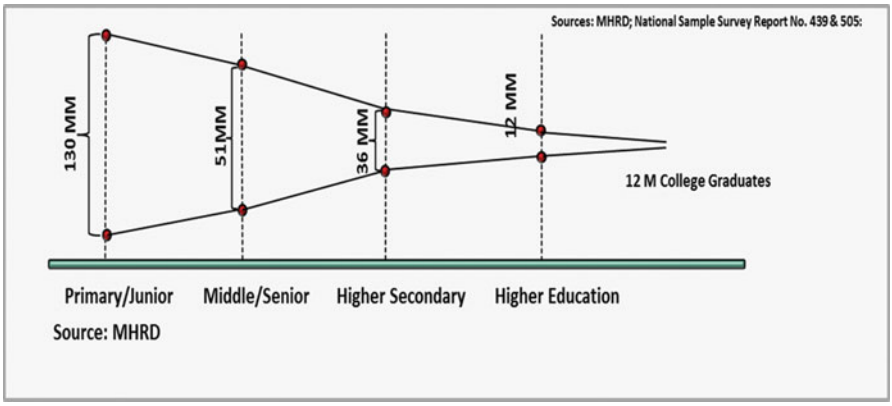

Fig. 10.1 High school dropout rates in India (Source: MHRD)

centre government, but in the 1960s, they were transferred to the states. Over the years, in addition to the government-run ITIs, a number of private sector-run Industrial Training Centres (ITCs) were also allowed to set up. Since then, the ITIs and ITCs have grown in numbers with numerous vocational courses being added to cater to the changing needs of industry. Curriculum, too, has been changed at periodical interval to ensure that these facilities continued to be relevant for the private sector.

At the beginning of the last decade, however, many stakeholders had already started asking questions whether the ITIs and ITCs – as they were organised and run then – should be restructured with the help of the private sector to preserve their existence and meet the objectives for which they were established, in the first place, even in post-reform India.

Public–Private Partnership (PPP): The First Experiments

Conscious of the need to involve the private sector in the modernisation of the ITIs, the government in the early 2000s decided to embrace the concept of public–private partnership in the ITIs, with the necessity for the PPP approach emphasised by the Prime Minister at an award function of the Ministry of Labour and Employment in New Delhi on October 4, 2004.

Subsequently, out of 1,896 ITIs, during the financial year 2005–2006 (April 01, 2005 to March 31, 2006), it was decided to upgrade 100 ITIs through domestic resources, 400 ITIs with World Bank assistance and, significantly, the remaining 1,396 through the PPP mode.

The scheme 'Upgradation of 1,396 Government ITIs through Public–Private Partnership' was launched in 2007–2008. Under this scheme, one industry partner is associated with each ITI to lead the process of upgradation. An Institute

Management Committee (IMC) is constituted or reconstituted with the industry partner or its representative as chairperson and registered as a society. An interest free loan of $0.5 million is given directly to the Chairman of the IMC for upgrading training infrastructure. After keeping a certain amount as seed money (maximum up to 50% of the loan), the balance amount is planned to be utilised within a period of 5 years from the year of release (State Labour Minister Conference 2007).

Financial and academic autonomy is granted to manage the affairs of the ITI. State governments continue to have ownership of the institute and regulate the fees, and admission, except for 20% of the seats which are delegated to the management. A memorandum of understanding is signed among different stakeholders. Till September 2009, 721 ITIs had been covered under this scheme.

The total outlay of the scheme was $710 million.

That's not all.

In May 2007, the government also made operational the Modular Employability Scheme (MES) under its Skill Development Initiative Scheme (SDI) to further the PPP agenda. SDI is a 5-year project during which one million persons are proposed to be trained and the existing skills are to be tested and certified. The objective of the scheme is to provide employable skills to school leavers, existing workers and ITI/ITC graduates to improve their employability by optimally utilising the infrastructure available in government, private institutions and industry. Skill levels of persons already employed can also be tested and certified under this scheme.

Public–private partnership is envisaged in the form of active participation of the industry/private sector in every stage of design and implementation of this scheme:

- Forecasting of emerging areas of employment at micro level
- Development of course curricula of various trades
- Development of instructional material for training
- Assist in the training of trainers, wherever required
- Making available their training and testing facilities, wherever required
- Provide on-the-job training in their establishments
- Development of assessment standards
- Monitoring and quality assurance
- Assistance in placement of graduates
- Provide trade experts to work as assessors of competencies
- Voluntary donation of equipment to the ITIs/other training institutions
- Providing guest faculty in new trades

In parallel, to address needs of sectors, different ministries, such as Ministry of Textiles and Tourism, launched their own version of PPP projects. Also Ministry of Rural Development as well as Ministry of Housing and Poverty Alleviation announced schemes of livelihood, by inviting the private sector to provide skill-based initiatives. Over a period time, multiple ministries had a variety of programmes, some run by the centre and other in partnership with the states. Simultaneously, the states also started skill development programmes in the PPP

mode as well. However, there was a felt need to increase capacity, align and coordinate the programmes and also focus on outcomes. State government in India has also taken PPP road. For example, Karnataka State has collaborated with Kangan University of Australia and TAFE Vocational Educational Institution for training programme for trainers, and Tamil Nadu State Government has established vocational training institute in PPP model in sectors like aviation and shipping.

Prime Minister's Vision and National Policy on Skill Development, 2009: Unlocking the Potential of the Private Sector

In August 2008, the Prime Minister outlined his vision for skill development in India. He stated that 'experts have estimated that India has the capacity to create 500 million certified and skilled technicians by the year 2022'.

The Prime Minister also outlined the institutional structure at the national level for coordinated action in the skills space. This consisted of the establishment of a National Council for Skill Development, chaired by the Prime Minister himself, at the apex to lay down the broad framework for this arena, a National Skill Development Coordination Board (NSDCB) coordinated by the Planning Commission to combine public and private prongs of action and the setting up of a National Skill Development Corporation (NSDC) as a no-profit-no-loss company through the public–private partnership route to catalyse private sector involvement in the skills space.

In March 2009, the government announced a National Policy on Skill Development laying down the framework within which it wanted skills-related training to be conducted. The policy clarified the roles that different stakeholders – government, industry, trade unions and civil society – would need to play for the creation of a skills ecosystem in India.

Making a departure from the past, the 2009 Skill Development Policy clearly specified that skills-related training should become outcome focused and linked to jobs and employability. It said that skills should become fungible to allow for a seamless transfer from a vocational education stream to a formal education system.

The policy said that the government should complement private sector initiatives in skill development and emphasised the need for short-term, industry-relevant courses. Significantly, the policy also talked of encouraging innovation in delivery and more public–private partnerships in the skills space.

In January 2011, the government appointed Mr. S Ramadorai, Vice Chairman of India's biggest IT software firm, Tata Consultancy Services (TCS), as Skills Advisor to the Prime Minister with the rank of a Cabinet Minister to provide an impetus to the skilling mission (Fig. 10.2).

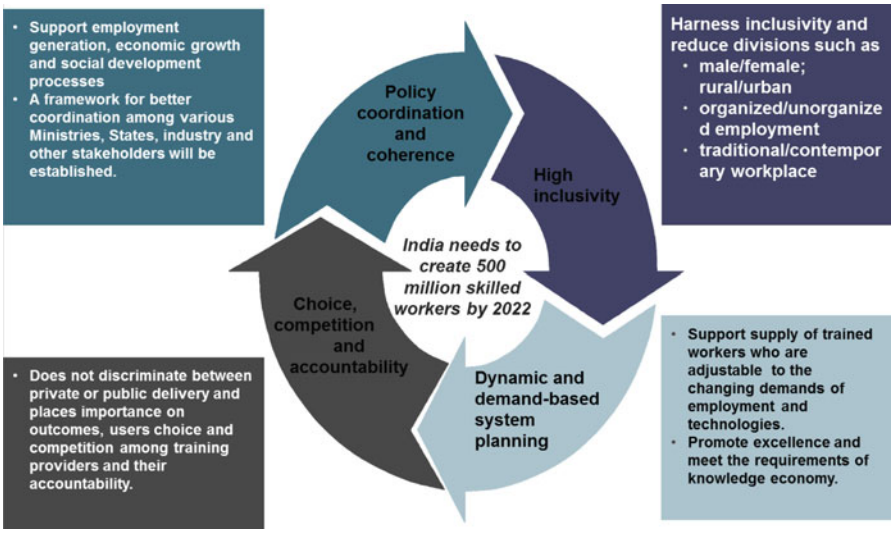

Fig. 10.2 Four main agenda of National Skill Development Policy, 2009 (Source: Pictorial depiction, Author 2012)

National Skill Development Corporation (NSDC): Transforming the Skills Landscape

A unique experiment in the skills arena, NSDC was officially launched in October 2009 with a mandate to skill 150 million people by 2022 in 20 high growth sectors and unorganised sector (Government of India 2009) identified by the government and the informal segment through a three-pronged approach revolving around creating, funding and enabling sustainable skills training initiatives in the private space.

Structured as a PPP with government ownership restricted to 49% of the equity capital, majority ownership of the NSDC rests with the private sector with the shareholdings equally dispersed among 3 National Industry Associations/Chambers of Commerce and 7 sector-specific industry organisations. The funds for meeting the funding requirements, though, are made available to the NSDC through a trust called the National Skill Development Fund (NSDF). NSDC acts as an investment manager for the NSDF, whose corpus of $330 million has gone up to $550 million following the Finance Minister's announcement of a further infusion of $220 million in 2012–2013. Going forward, the NSDF is envisaged to attract bilateral, multilateral and private funding (Fig. 10.3).

A not for profit (Section 25 Company under the Indian Companies Act), NSDC is a board-managed enterprise, with its 16 directors (6 from the government and 12 seats held by private sector shareholders) taking the final call on how best to structure the funding and which proposals should be financially supported by the organisation.

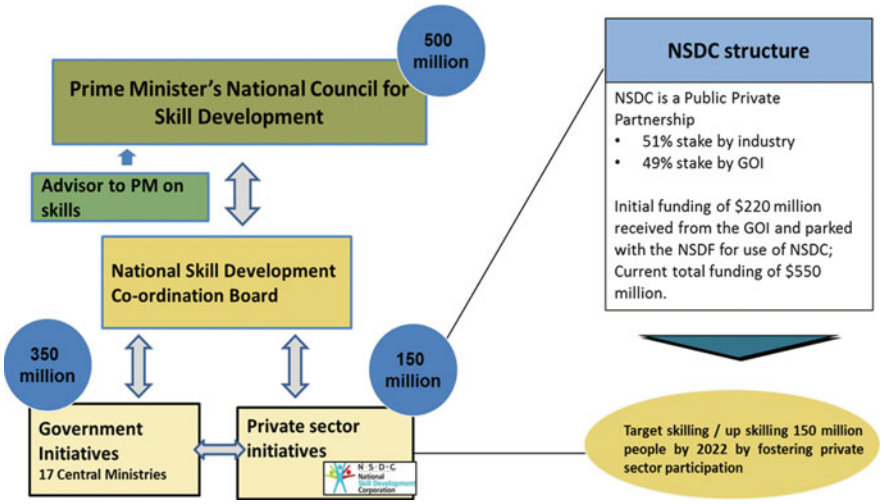

Fig. 10.3 NSDC ownership pattern (Source: Pictorial depiction, Author 2012)

Over the nearly two-and-a-half years that the NSDC has been operational, the Corporation has put in place a mechanism that would allow for the creation of demand-driven large (at least a 100,000 over 10 years), for-profit skills training ventures linked to jobs and employability, with the onus on the skills provider to ensure the employment of at least 70% of the people they trained (Fig. 10.4).

From big corporates such as Centum (Bharti Group), TVS, Future or NIIT to NGOs such as Pratham, or from educational institutions like the Centurion Group of Orissa to social entrepreneurs, there has been a growing interest among organisations to align with the NSDC to start sustainable skill development ventures.

Corporate groups have increasingly started seeing merit in setting up skilling ventures of their own or supporting the skills mission by hiring skilled workers at all levels. Enquiries on how organisations could associate with the NSDC have increased substantially, which, in turn, has resulted in more proposals being submitted and approved for funding by the NSDC Board.

Importantly, again, the proposals for skill development have encompassed diverse spheres and different geographies.

By seeing its role as that a social venture capital-cum venture debit/development bank and putting its own skin in the game through patient capital, flexible financial terms and also a transparent and time-bound project approval, funding and monitoring framework, the NSDC has enabled its partners to make a business out of skills. A recent report by Kotak Institutional Equities (2011) has forecast that skill development can become a $20 billion business by 2022. Other reports have supported this market size.

Each skill development project proposal (including capex-heavy models generally oriented towards engineering/manufacturing skills) submitted to the NSDC is thoroughly evaluated by external financial and legal due diligence partners and then

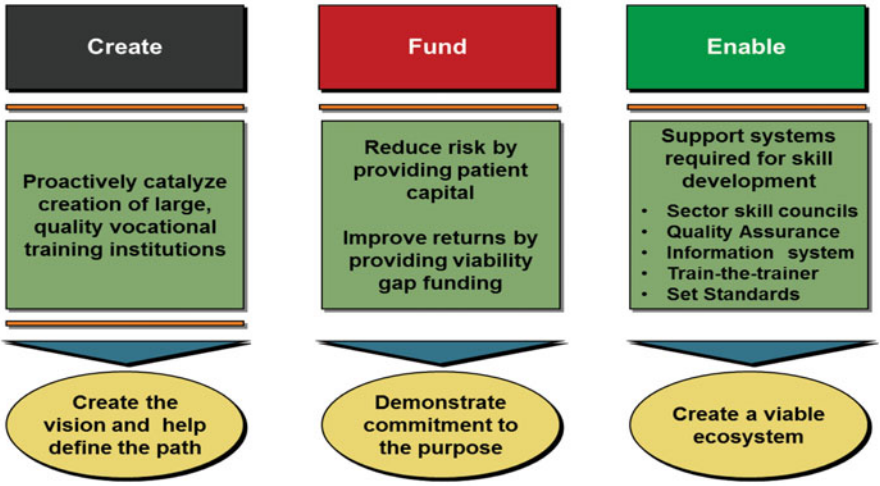

Fig. 10.4 Various roles of NSDC (Source: Pictorial depiction, Author 2012)

approved by an independent Project Approval Committee before the final sanction for funding is given by the NSDC Board. Each project is evaluated on the basis of several parameters that include assessing the market demand for trained manpower of the targeted sector, comprehensive evaluation of the course curriculum with more focus on practical training to meet industry standards and a study of the model followed for sourcing of trainers and collaborations with various corporates for placements to ensure that the business model is a holistic one (Fig. 10.5).

NSDC has established a comprehensive monitoring framework which is outcome focused and monitors projects at different stages of their life cycle. With such a system in place, information on various aspects, such as, for example, the sector-wise training done, social excellence and financial excellence of the various models and states where the model is successful and where it needs to be reworked, can easily be gathered. Such an analysis by the NSDC also comes in handy for a partner to develop models for the dynamic and ever-evolving skill development industry.

Till June 2012, the NSDC Board had committed funds to 65 projects, of which 52 are pure-play training proposals and 13 are Sector Skill Council initiatives. Till June 2012, NSDC partners had trained over 210,000 people across India and ensured jobs for over 160,000 of the young boys and girls who enrolled at their institutions to pursue skill development courses.

Against the NSDC's proposed investment of $299.5 million in these projects, more than $110 million would come from the private sector partners. During the course of a 10-year period, these projects would seek to raise more than $16 billion from the skills ecosystem.

Till June 2012, NSDC partners had set up 3,788 physical and mobile training centres and established a presence in 365 districts nationwide. NSDC partners have rolled out 403 courses that meet the skill development requirements of both the

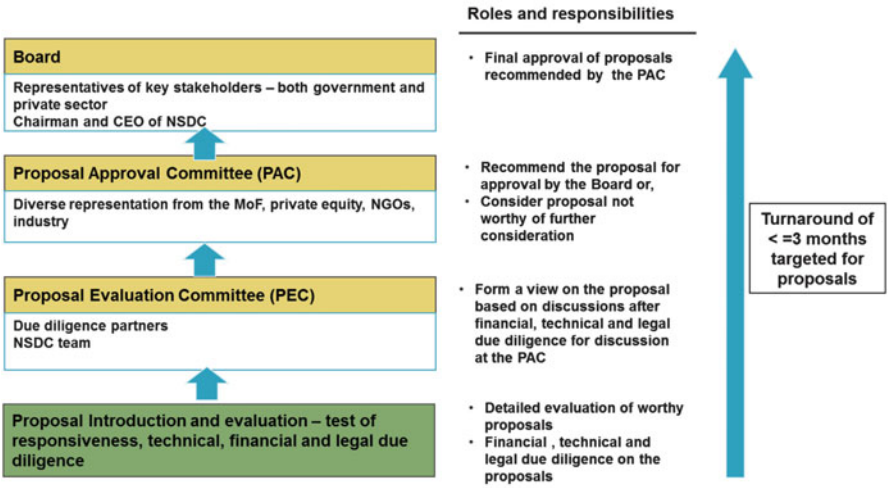

Fig. 10.5 NSDC funding pattern (Source: Pictorial depiction, Author 2012)

organised and unorganised sectors. Significantly, the capacity creation by NSDC partners has taken place not just in the bigger cities and towns but also in remote and far-flung areas and small towns and villages (NSDC 2012).

Special skills training initiatives of the NSDC have been helping youth in restive parts of north and north-east India to join the mainstream and participate in and contribute to the process of economic growth. NSDC has been able to get some of India's biggest corporate groups interested in the private sector-led skills training programme for graduates and post-graduates in northern India. This initiative is targeted to scale up to 40,000 people in northern India being skilled and placed in jobs over a 5-year span.

In the north-east, nearly 200 people have already benefitted from the Youth Employability Skill (YES) project for which the NSDC is partnering the Ministry of Youth Affairs and Sports. This number would rise to 1,000 over the next few months.

NSDC is ensuring a transformation in the skills arena with a new class of social entrepreneurs emerging in India.

Rather than be a pure-play financial institution, though, NSDC continues to focus on creating a supportive ecosystem for skill development. The emphasis is on creating a social market for skills and skill development. This is a tougher challenge than just funding entities to skill people.

To establish the demand for skill, NSDC has been commissioning sectoral and state-specific skills gap studies. Through this initiative, NSDC has been able to provide existing and prospective partners not only sectoral but district-level demand and supply perspectives for creating sustainable vocational training capacities. Skills gap studies are also being undertaken and commissioned for other critical sectors of the economy and ones holding promise. NSDC has already completed skills gap studies for Orissa and the eight north-eastern states, and the

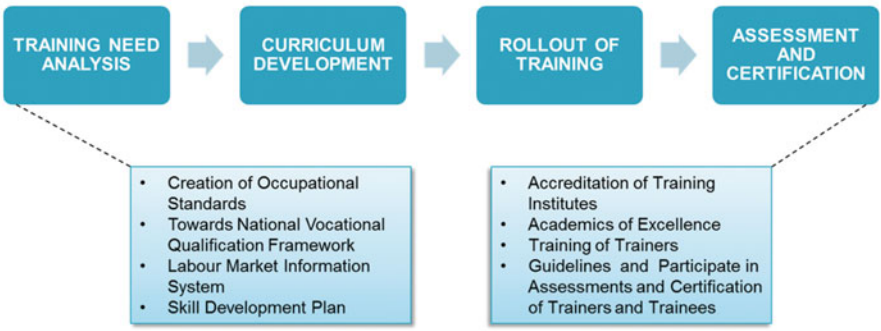

Fig. 10.6 Various roles and responsibilities of Sector Skill Councils in India (Source: Pictorial depiction, Author 2012)

infrastructure sector. Such studies are now being initiated for many other states. A sports skills gap study is also being done.

Through the incubation of industry-led Sector Skill Councils (SSCs) and development of Labour Market Information Systems, the NSDC has put in place the bedrock within which all skills training is to be conducted. NSDC has been actively engaged in fast-tracking the establishment of SSCs and integrating the courses being run by our training partners with the respective SSCs to facilitate SSC-driven accreditation, assessments, certification and employment. Industry leadership is required to ensure that the Sector Councils function appropriately and industry plays an active role. The challenge is to work collaboratively (Fig. 10.6).

Many of the NSDC's partners have embarked on large-scale training projects capable of training a minimum of a hundred thousand or more persons in 10 years either on their own or through consortiums and ensuring that the lack of trained people does not come in the way of the growth of Indian industry. This is not easy. It requires new forms of working and partnerships.

At places, these organisations are even teaming up with ITIs and other existing institutions to use the latter's spare infrastructure for running their courses in order to keep costs down and be in a position to start operations quickly. In other areas, school and other public infrastructure are being used. Training centres are being opened across the length and breadth of the country, including in areas affected by extremism.

NSDC-funded institution Gram Tarang, for instance, operates centres in the Naxal-affected belt of Orissa. Another NSDC partner IL&FS ETS proposes to start skill schools in some of the most backward areas of India so that the recipients of the training are in a position to get jobs or become self-employed (Fig. 10.7).

Many enterprises such as Empower Pragati are even training people to become housemaids or drivers and also helping them find gainful employment. Training organisations are setting up rural BPOs to employ persons trained by them and adding to the revenue streams.

Companies are also coming up with innovative financing models whereby a part of the training costs of students are being taken care of by the potential employers of

Fig. 10.7 NSDC partner Gram Tarang's training facilities

these trainees. Training firms are more often than not seeking potential trainees with employment letters from companies to mobilise students at their centres.

NSDC partners have been extensively using technology to skill people. Some partners are following a blended use of technology-based training (delivered through VSAT) and classroom or on-the-job training. Some of the partners adopting this approach are Talent Sprint, Orion, IIJT and Everonn. This ensures that while the country copes with a shortage of trainers at all touch points, youth are not deprived of quality that may be delivered through VSAT.

Many NSDC partners have also been using simulators to ensure that the trainee can experience the 'actual' feel of operating expensive machinery or measuring a person's blood pressure.

Nongovernment organisations have also begun looking at sustainable models so that their programmes can benefit more people. Grants are no longer being seen as the only mode of raising funds for their activities. Going forward, government programmes could move towards being scholarship or voucher-based funding with the students having the choice of institution that they wish to attend.

Educational institutions, too, are either starting separate courses for skill development or establishing exclusive facilities for skills-related training. A new category of social entrepreneurs is slowly but surely transforming the space.

Key Learnings

In the last 2 years, the skill development landscape in India has evolved tremendously. With a focused National Policy, various changes have happened at the centre and state levels, involving the private sector at various stages.

However, the biggest challenge in the skills space still lies in reaching the masses with quality training while keeping costs low at the same time. Scaling up of sustainable models still poses a big challenge since each state and sector has different challenges to deal with. It has been seen that a 'Hub and Spoke Model' is emerging as an attractive model catering to small batch sizes. The spokes located in remote areas help in attracting students for providing basic-level training. The hubs offer industry-specific training and have better infrastructure, including, for example, high-end machinery and VSAT facilities.

The question of who pays for the training still does not have a clear answer. Is it the employers who get day-one ready-to-work employees, the students who are guaranteed placements after the training with substantial increment in the salary, or does the onus still lie with the government? NSDC-funded partners have been working on innovative models of payment, such as 10–20% of the fees being paid up front, with the rest either paid in instalments/on placement with a corporate. In some cases, part of the fees is recovered from the employers as a placement fee. In another initiative, a vocational loan product was developed with banks. This allows trainee to avail of an unsecured loan for as low as $90.

Student mobilisation is also made difficult by the struggle vocational training in India faces to gain its due importance. In order to counter a misconception around skills that it is only meant for those who could not make it in the formal education system, NSDC has already started working on a Communications Campaign that would seek to glorify the pursuit of skills and explain to all stakeholders how a skilled workforce is absolutely essential for India to grow and prosper.

The proposed multilingual campaign will target all stakeholders – the prospective trainee, the society to which he/she belongs, corporates which would be hiring skilled workers, enterprises which would like to start sustainable skill development ventures, governments both at the centre and states and the media to highlight the importance of skilling in a nation's advancement. It is not an easy task as many stakeholders have to be aligned to make it successful. Although seen by many as a panacea for filling the classroom, it would be dangerous to pin all hopes on the campaign alone. Training organisations have to build connections with the heart and soul of the many young people in the country and learn to tailor their offerings to fulfil their aspirations and also to meet the needs of the employer.

To create an aspiration for skills, NSDC took on the responsibility of organising the Indian participation at the 2011 WorldSkills competition in London. A biennial event, WorldSkills is seen as a Skills Olympics and is designed to test the skills of people below the age of 23 in several disciplines from car painting to IT software. India took part in 15 skills at the London WorldSkills event. NSDC has already started preparing for the 2013 WorldSkills competition which would be held in Leipzig, Germany. The idea is to benchmark the progress in India with the rest of the world.

Conclusion and Recommendations

The overwhelming response from the private sector to partner the NSDC is a clear proof of the fact that with a proper model in place, the public–private partnership approach can succeed. Over 2,000 employers are currently meeting their needs of skilled manpower from NSDC partners confident in the knowledge that the training imparted at NSDC-funded institutions has prepared the youth passing out of these centres to start contributing from day one onwards. The equity infusion by PE firms/leading philanthropic organisations or foundations, including the Michael & Susan Dell Foundation, in several NSDC partners is a very good testimony of the workability of the NSDC-funding model. NSDC partners have demonstrated that

skill development can become a sustainable business, with the potential to become the largest social enterprise sector, and should not be viewed from the prism of aid/charity/corporate social responsibility initiatives.

All said and done, though, there is no getting away from the fact that skill development still has to establish deep roots in India.

Skill development is a national priority and needs a coordinated approach by combining separate areas of government action on workforce participation, social inclusion and innovation so that policies on skills can connect with the wider economic, employment and social strategies.

While governments at the centre and states can provide an enabling environment, leadership has to be taken by employers and industry for the identification of competencies and development of competency standards, carrying out an analysis of skill demand, and development of curriculum. Facilitating training of trainers, helping in the delivery of training, monitoring and evaluation, participation in the affiliation and accreditation process, sharing of workplace experience, machinery and equipment, taking the initiative for setting up Sector Skill Councils and hiring skilled persons at all levels should also be taken care of by industry.

It is imperative that all stakeholders have financial stakes in the skills process for the evolution of a sustainable skill development model. Industries have to realise that collaborative partnerships benefit all. Sectoral models that plan for the workforce development of a sector have a far better chance of succeeding than individual company-related efforts.

Organisations have to leverage technology better as technology-led interventions dramatically increase scale, reduce cost and improve learning. Workforce planning should be forward looking and outcome based. The Employee Skilling Opportunity Programmes should be seen in the same light as ESOPs. Challenging HR and training departments to look at 'outsourcing as a means to increase return on investment in training and development' is probably going to be the next best practice. In today's world, skilled people will make the difference. Last, but most importantly, skill development needs to become a CEO-level agenda and discussed in boardrooms. It is far too serious an issue to be the sole preserve of the HR/CSR cells of organisations. The speed at which this happens would determine whether a decade from now, India would still be counted as one of the fast-growing developing countries or an influential member of the First World.

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Chapter 11
Skills Training and Workforce Development with Reference to Underemployment and Migration

Brajesh Panth

South Asian Context

Asia 2050 (Asian Development Bank 2011) presents two scenarios: (1) the Asian Century with a sustained high economic growth leading to doubling of Asia's share of global GDP from around 25% currently to just over 50% by 2050 and (2) the "middle-income trap" for several countries, leading to much lower growth and GDP. To sustain growth and realize the Asian Century, Asia needs to match its investments in infrastructure with commensurate investments in human capital to sustain inclusive growth (high-quality education, innovation, and knowledge management), reduce rising inequality amidst rapid economic growth, and innovate to increase productivity to move up the value chain to avoid the "middle-income trap." Of the countries expected to be at the forefront of growth as per *Asia 2050*, India in South Asia is expected to be one of the leaders to achieve a sustained high economic growth rate. Other countries are expected to be on a slower trajectory, but they have high potential if they are able to undertake and sustain major reforms. All these countries have to overcome increasing inequality within countries, rising income disparities across countries, intense competition for finite resources, global and climate change, and poor governance and weak institutional capacity.

South Asia is one of the fastest growing and dynamic regions in the world. Its population is also one of the youngest in the world, with 40% of the population below the age of 20. The population is expected to grow for the next three decades before stabilizing. With significant increase in labor mobility and the young labor

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force expected to increase by more than 350 million people or 40% of the increase in the global labor force in the next two to three decades (World Bank 2011b), South Asia has a major window of opportunity to tap "demographic dividends" to become a major supplier of the global labor force, at least in the short to medium term. The dual challenge of South Asia is to create more quality jobs and concurrently improve productivity of the labor force to move up the value chain to avoid falling into the "middle-income trap."[1] Not living up to this challenge risks turning the demographic dividends into a curse. Two concurrent strategies are therefore vital for South Asia: (1) enhancing skills of its overseas labor to double or triple remittances in the shorter term and (2) invest strategically in education and training to prepare high-quality labor to sustain higher economic growth including expanding labor market opportunities to absorb the growing labor force in the domestic market in the longer term. Ensuring this balance will serve as a tipping point for South Asia.

Human Development in South Asia

Compared to other regions of the world, South Asia's performance in human development is only slightly better than that of sub-Saharan Africa and has continued to lag behind other regions by a wide margin (see Table 11.1). While the average years of schooling in South Asia have improved in the past five decades,[2] with primary education almost reaching the global average, secondary education lags behind significantly, except for Sri Lanka (with over 10 years of average schooling), which is far ahead of the South Asian average due to its sustained investment in the education sector since the 1940s. South Asia was able to increase the mean years of schooling of its population from 2.9 years to 5.6 between 1980 and 2005 compared to sub-Saharan Africa's achievement of 2.8–5.5. However, South Asia lags behind significantly compared to the corresponding mean years of schooling of 8.3 and 8.4 for East Asia and Latin America in 2010, respectively, and 10.6 years for the advanced countries (International Labour Organization 2012). In other words, although South Asia has been able to catch up in terms of primary education, it needs to step up its efforts to do the same at the secondary level, with substantial improvements in quality, relevance, and functional skills.

Currently, the gross enrollment rate for secondary education is less than 60% and for higher education less than 15%, compared to over 90% and over 30%, respectively, for most of the other regions. Although rising, the human development

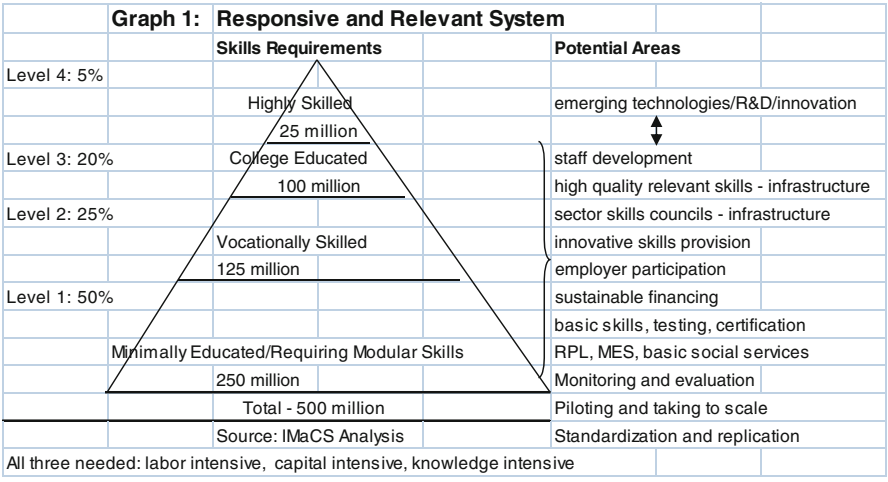
[1] McKinsey Quarterly (2011). *Why US productivity can grow without killing jobs*. The report shows how the United States was able to realize productivity gains continuously over the past 80 years, largely due to its sustained investments in skills and infrastructure, and the associated gains in knowledge, technology, and innovation. More recently productivity gains have been associated with efficiency.

[2] Barro and Lee (2010). The study shows robust evidence of a positive association between changes in education and economic growth. However, it also shows a persistent gap in the achievement of students in developed and developing countries over time.

Table 11.1 Human development indicators (latest)

Indicators	Bangladesh	India	Nepal	Pakistan	Sri Lanka
Population (million)	148.7	1,170.9	29.96	173.6	20.9
Population growth rate	1.12	1.34	1.77	1.80	0.92
Adult literacy rate	55.9	65.0	59.1	55.5	90.6
Average years of schooling	6.19	5.74	4.68	5.0	10.43
Secondary GER	49.29	60.16	43.50	34.23	87.07
Tertiary GER	10.59	16.23	5.56	5.36	12.0
Life expectancy	68.9	66.33	68.77	65.85	77.73
Human Development Index	0.500	0.547	0.458	0.504	0.691
HDI rank	4	2	5	3	1

Source: World Bank and ADB databases, various years (Data for available latest years)
GER gross enrollment rate, *HDI* Human Development Index



Graph. 11.1 Responsive and Relevant System (*MES* modular employable skills, *RPL* recognition of prior learning)

index in South Asia is still quite low, with the exception of Sri Lanka. Successful countries focus on basic schooling as a foundation for developing a solid skill base of their population. For example, the Republic of Korea and more recently the People's Republic of China (PRC) have demonstrated how almost universal completion of basic education (9 years or more) provides the foundation to build on needed soft skills. India is now moving in this direction with its policy to achieve universal access to secondary education by 2017. Sri Lanka has already achieved an average schooling of over 10 years compared to less than 6 years in South Asia. Other South Asian countries are also moving in this direction with priority programs.

Graph 11.1 provides the overall needs for skills development in India. Although each country in South Asia is different, this framework is useful to analyze more broadly the situation in all countries. It illustrates how crucial it is for South Asia to significantly enhance its average educational attainment and skills of high quality to move up the value chain and not succumb to the "middle-income trap."

Due to uneven quality of education, the soft skills (team work, analytical skills, critical thinking, communication, problem solving) required for the world of work remain inadequate among graduates of formal schooling. This is also true at higher levels of education, including technical/engineering higher education. As a result, the soft skills that the formal education system has failed to develop among its graduates are putting pressure on skills development system to compensate, which is unrealistic. Moreover, linking skills training to the failure of formal education will only exacerbate and protract the situation since this reinforces the perception that only those who fail formal schooling seek skills training, a social stigma that is difficult to undo. Therefore, when arguing for enhancing skills of the population in general and the workforce in particular, the South Asian countries have to view the entire education system in totality in order to make a balanced investment in education and training to optimize synergies needed between formal education and skills training. This chapter emphasizes the need to invest in *lifelong learning* to create such synergies as a long-term strategy across the education sector to systematically address skills development and employability to move to a trajectory of sustained high economic growth.

Global Labor Market Situation

McKinsey's latest report—The World at Work: Jobs, pay and skills for 3.5 billion people—provides the following important findings that have major implications on South Asia (McKinsey and Company Global Institute 2012): (1) 1.1 billion non-farm jobs have been created in the past decade, of which 80% are in developing economies; (2) 245 million college graduates have entered the labor force; (3) foreign-borne workers accounted for 40% of the total labor force growth; (4) 1 in 5 nonfarm job was associated with exports; (5) there were 75 million unemployed youth in the 15–24 age group; (6) the global labor force is expected to grow from 2.9 billion today to 3.5 billion by 2030; (7) it is estimated that there will be a potential shortage of 38–40 million college graduates in the labor force by 2020; (8) South Asia and Africa will account for 60% of the labor force growth; and (9) there will be an additional 360 million older people that will not be part of the labor force. It also notes that the "great recession" has pushed more people to long-term unemployment and youth unemployment has reached crisis proportions. The report cautions that there will be a surplus of 90–95 million (13% of demand) low-skills jobs and a shortage of around 45 million mid-skill jobs (15% of demand) in developing countries. A major implication is that without aggressive investment in education and training, millions of people may be trapped in the subsistence agricultural jobs, and the economies will see slower productivity gains.

Labor Market Situation in South Asia

The labor force participation rate in South Asia was around 57.1% (81.4% for males and 31.7% for females) in 2010, ranging from 54% in Pakistan and Sri Lanka to over 70% in Bangladesh and Nepal. Due to relatively low participation rate of

Table 11.2 Labor market indicators

Indicators	Bangladesh	India	Nepal	Pakistan	Sri Lanka
Percent of youth population (15–35 years)	37.81	35.1	35.94	35.0	34.23
Labor force participation rate	70.7	57.6	71.5	54.3	54.2
Labor force growth rate				2.7	0.5
Annual new labor market entrants (million)	1.5	12.5	0.45	1.2	0.30
Unemployment rate	4.3	4.4	2.8	5.0	4.9
Youth unemployment rate	9.0	11.0	8.8	8.0	21.0
Share of informal labor force	85	82.8	71.6	63.1	39.8
Dependency ratio	54.7	56.3	68.3	69.4	46.5

Source: World Bank, International Labour Organization, various years (latest)

women, the overall labor force participation is lower compared to other regions. While the overall unemployment rate is relatively low at less than 5%, the youth unemployment rate is much higher at over 10% (21% in Sri Lanka). Given that South Asia accounts for 27% of the world youth population, this continues to pose a major source of disenchantment and potential threat to peace and stability in the region. The low average unemployment rate grossly masks a very high underemployment rate, which is estimated at over 30%. Every year over 16 million people enter the labor force in South Asia, which is the highest in the world. However, the employment growth rate has declined from around 2.5% during 2001–2006 to around 0.7% in 2010, partly reflecting the slowing down of the economic growth rate. Around half of the working poor live in South Asia. The vulnerable employment rate of 81.8% in 1991 declined to only 77.7% in 2011 (83.8% for women and 75.5% for men) (Table 11.2)

Over 70% of the labor force is engaged in informal or unorganized labor in South Asia. Much of this is stuck in the agricultural sector, which will need to transform in order to have a major dent on informal employment.

In line with the global trend, the contribution of agriculture to GDP is gradually declining, ranging from agriculture's share of GDP from 12.8% in Sri Lanka to 34.9% in Nepal. While the share of the services sector is generally quite high (over 50%), the share of manufacturing has increased only marginally (around 20%). Despite the declining share of agriculture, the share of employment in agriculture is still very high in South Asia, ranging from over 30% in Sri Lanka to over 50% in India and Nepal. Interestingly, even the PRC, which has been highly successful in transitioning from largely an agrarian economy about 30 years ago to a robust economy with the share of manufacturing and services sector at over 40% of GDP, the employment share in agriculture is over 30%, similar to what is observed in South Asia. Thus, the sticky nature of agriculture's share of labor remains a major challenge for South Asia (and other regions); this is where a major dent is needed by creating jobs at this level to crack informal and/or unorganized labor including increasing productivity. This is not limited to labor market issues, but also requires technological solutions as well as land management, combined with targeted education and training to enhance the overall productivity of agriculture (Table 11.3).

Table 11.3 Economic structure—share of GDP and employment

	Bangladesh		India		Nepal		Pakistan		Sri Lanka	
Economic Structure	2000[a]	2010[b]	2000[a]	2010[b]	2000[a]	2010[b]	2000[a]	2010[b]	2000[a]	2010[b]
Share of GDP										
Agriculture	25.5	18.8	23.4	19.0	38.6	36.0	25.9	21.2	17.6	12.8
Industry	25.3	28.5	26.2	26.3	9.2	7.6	23.3	25.4	29.9	29.4
Services	49.2	52.6	50.5	54.7	52.2	56.5	33.5	35.2	52.5	57.8
Share of employment										
Agriculture	62.1	48.1	59.8	51.1	73.9	36.8	48.4	44.7	30.7	32.6
Industry	10.3	14.5	16.4	22.0	6.8	7.6	18.0	20.1	25.6	25.1
Services	23.5	37.4	24.1	26.5	19.3	55.5	33.5	35.1	38.4	39.6

Source: World Bank, ADB, ILO databases, various years (Data closest to the corresponding years)
The total for a country may not add up to 100; there is another category for those unsure about any one sector
[a]data refer to 2006 or closest to the corresponding year
[b]data refer to 2010 or closest to the corresponding year

Skills Training System in South Asia

All the South Asian countries have technical and vocational education and training (TVET) system, but the average share in financing and enrollment is still very low to have a meaningful dent on the economy. For example, there are around 13 million new entrants in the labor market every year in India, but the existing capacity to train is less than 25%. Similarly, there are over 1.5 million new entrants in the labor market in Bangladesh and around 450,000 in Nepal, but their capacity to train is only a fraction of the need. Of the existing training capacity, much needs to be done to enhance the overall quality and responsiveness of the TVET system. The TVET system is also plagued by very high internal (low completion rates) and external (low placement rates) inefficiencies. Another challenge facing South Asian countries is that the average educational attainment of those in the labor force and those entering the labor force is very low (over 50% of the labor force is without primary education in India and Nepal) compared to other regions, with the exception of Sri Lanka. Public spending on TVET is very low in South Asia (less than 5% of the education budget) compared to what it needs to meet the enormous needs for training. This is further compounded by the extremely fragmented status of training, with over 15 ministries involved in skills training in most countries.

TVET programs are largely supply driven. While the private sector is producing more graduates particularly in shorter TVET courses, TVET in general is dominated by the public sector, with very limited share of enterprise-based training compared to other regions of the world. The overall impact is little known due to an absence of systematic tracer and impact studies. Ironically, unemployment among the TVET graduates remains unacceptably high, and completion rate is low. The poor results are largely due to four major factors, among others: (1) the state-led model of the early years was too inward looking and rigid, and has not improved enough to respond to the emerging labor market needs, influenced by domestic factors as well as globalization; (2) the TVET in each country is yet to establish and operationalize some of the key elements such as a reliable labor market information

system to track employer needs and feedback, a qualification framework to establish a robust system over time to ensure quality assurance, and a limited capacity for training of trainers to sustain quality expansion; (3) the involvement of the private sector particularly in enterprise-based training is very limited including a lack of incentives for such involvement; and (4) in general the investment in human capital has been low and lopsided in South Asia which has constrained a balanced development of the education system, and resulted in a very limited development of the TVET system.

The current state of TVET system calls for urgent rethinking and some bold initiatives to revamp the TVET system to skill and/or up-skill a large number of people within a relatively short period, if these countries are to reap the benefits of the "demographic dividends." Almost all countries realize the need to enhance skills development capacity; they have also made important commitments in their national plans to systematically redress the current situation. For example, India has expressed its commitment in three major programs—Sarva Shiksha Abhiyan (universal basic education), universal secondary education, and commitment to skill/up-skill 500 million people by 2022. Sri Lanka has made a similar commitment in its development plan to provide training to a large number of its school graduates that are unable to enter the higher education system. Bangladesh recently approved a new TVET policy, and Nepal is considering one with the move to establish a skills fund through public–private participation to train a larger number of people. These changes are particularly crucial in South Asia that is facing energy crisis; rapid expansion of urban areas that require expertise for municipal services and maintaining infrastructure; shortage of skilled people in health, education, and training; and pressure to significantly raise productivity of the agriculture sector to address sustainable food security, promoting environmentally sustainable investments, and promoting innovation and technology solutions to leapfrog development.

Key Challenges Facing Skills Development in South Asia

All the countries in South Asia are keen to invest in skills development as this provides a major source of transforming the economies of these countries. Given the relatively low HDI of these countries, it is crucial to make balanced but higher investments between education and skills development. However, in order to optimize investments, South Asia needs to address the following key challenges:

Large mismatches. South Asian countries face serious problems of three types of mismatches—demand and supply, geographic, and sectoral.[3] A combination

[3] This is largely extracted from the "India Labor Report 2009" by TeamLease and Indian Institute of Job Training, which analyzes these mismatches in India. These mismatches are similar in nature in other countries in South Asia.

of a dynamic labor market information system (LMIS) along with targeted training and placements is needed to address the three mismatches effectively.

Despite the increase in average years of schooling among the youth population and more youth completing secondary and higher education, the employability of people remains difficult because education does not necessarily provide employable or vocational skills although it does contribute to soft skills. In South Asia, it is expected that there will be more people than the available jobs at the low-skills level, while there will be more jobs at the high skills level (college graduates) than those available for such jobs. This *demand and supply mismatch* indicates that there is a serious mismatch between the education and skills that the youth attain and what the labor market demands. In the case of Sri Lanka, the youth have attained impressive levels of education, but their unemployment rate is also quite high at around 21%. On the one hand, a significant proportion or around one-third of those graduating from university migrate to other countries, a significant proportion of those who stay behind encounter joblessness in Sri Lanka. This is also true in other countries in South Asia with a less magnitude although the educational attainment is much lower.

Geographic mismatch is another serious problem plaguing the labor market in South Asia although this has a more serious impact in larger countries such as India and Pakistan. In India, the states with much higher economic growth rates have new jobs opening up, but fewer workers are available since their population size is growing more slowly. On the other hand, the states with slower economic growth rates also have higher population growth rates with fewer new jobs opening up. The lagging states have to rely on migrant workers as a short-term strategy to cope with this challenge. Again, this mismatch is quite common in other countries of South Asia that continue to rely on export of migrant workers to offset the domestic mismatch.

The third mismatch is the *sectoral mismatch* which has led to a mismatch between the education and skills that the labor force possesses and the growth in the key economic sectors (agriculture, manufacturing, and services). For example, although the contribution of agriculture to GDP in all the South Asian countries has continued to decline, the proportion of employment has not declined accordingly. This means, those working in agriculture have not been able to increase their productivity and are stuck with a low income. Targeting training to those stuck in the informal sector or low productivity areas will be crucial.

Low educational attainment and high inefficiency. While South Asian countries have made progress on educational attainment, the region still lags behind substantially compared to other regions. The labor force is ill prepared for higher level jobs, which limit them to low-paying jobs. A large percentage of the labor force does not have any education although this is gradually improving. A low percentage of the labor force has higher education, and only a small percentage has some form of skills training. Without a massive effort to expand the capacity to provide high-quality formal education along with high-quality market responsive skills training, the labor force will not be able to benefit from the high economic growth. The soft skills that come from formal education are crucial to

lay the foundation for further skills training. Therefore, South Asian countries need to pursue quality improvement at all levels of education while targeting skills development for optimal return.

Large informal sector. Most of the countries in South Asia have a large informal sector, ranging from over 70% of the labor force in Bangladesh and Nepal to over 80% in India. While the contribution of the agriculture sector to GDP is declining, a large proportion of the labor force is still stuck in agriculture. This remains as one of the biggest challenges.

High youth unemployment. While youth unemployment is 2–3 times the adult unemployment in most regions, it may be almost 4 times in South Asia. Unless this issue is addressed seriously, it will continue to risk destabilization and discontent among youths given that South Asian countries have a large proportion of youth population with growing aspirations.

Demographic transition. Clearly, with over 30% of the population below 14 years, most South Asian countries have a very young population, which is why South Asia has a major but limited window of opportunity (demographic dividends) to tap to catch up. The dependency ratio in South Asian countries will remain low for the next three decades, providing a major competitive advantage over many advanced countries as well as some emerging countries like the PRC where the population is beginning to age fast. In the short term, this can cater to the needs of those advanced countries that will face labor shortages due to aging and decline in population growth. But, given the low education and skills base of the South Asian population, unless the countries are able to invest in education and skills of the population urgently, there is a real danger of falling in the "middle-income trap," and the demographic dividends can easily turn into a curse. South Asia can learn from the East Asian "miracle" because "East Asia invested in its populations and converted them into highly skilled human capital."

Image and mobility. TVET has had a very poor image in South Asian countries because it is generally meant for those who fail the formal system. However, with labor mobility increasing substantially due to globalization along with remittances of migrant labor becoming a major share of GDP, these countries have realized the need to provide relevant skills to its migrant labor to increase remittance income two- or threefold within a relatively short period. The short-term focus on targeted skills training with a long-term focus on improving the quality of formal education at all levels will provide the necessary foundation for the much needed lifelong learning to enhance the human capital base of South Asian countries to sustain high economic growth.

Private sector participation. Although the majority of skills training in most of the South Asian countries is provided by the private sector, there are three interrelated problems: (a) the placement rate is not better among graduates from private training programs, (b) the private sector is not involved adequately in curriculum and policy to ensure relevance of training, and (c) the public training programs are largely of long duration and rigid, and the placement is low, leading to high cost of training. Strong policy measures and operational linkages are needed to bring together the public and private sector to improve the quality and relevance of training.

Balance between existing and emerging jobs. Several factors will shape future jobs: (a) South Asian countries are investing heavily in infrastructure (energy, transport, and municipal services), which will require commensurate skills to maintain and utilize optimally the rapidly building infrastructure; (b) quality and coverage of education is improving fast which will lead to higher skill jobs including the use of technology solutions that will be vital for leapfrogging development; and (c) environmentally sustainable development will increasingly require focus on green jobs which will require reorienting skills accordingly. Therefore, South Asia needs to balance between existing and emerging jobs to take advantage of new opportunities. In addition, it is equally important to focus on the following areas identified by the *India Labor Report 2008* that are generally relevant broadly to evolve a good employment ecosystem: (a) rural to urban migration, (b) farm to nonfarm switching, (c) movement from unorganized to organized sector, and (d) transfer from subsistence self-employment to quality-wage employment, as these are equally applicable to other South Asian countries.

Skills Training: Paradoxes and Options

Skills training can play a transformational role in South Asia given that the status of education and particularly skills is still at a low level. In order to expand the coverage and relevance of skills training and to make it highly responsive to labor market needs, it is crucial to address some important paradoxes associated with skills training:

1. Developing countries require substantial investment in establishing market responsive skill development programs to move up the value chain. However, many established TVET programs are government run and suffer from weak relevance and high inefficiency, including high dropout and failure, and poor placement rates. Options to address this constraint include providing fiscal and administrative autonomy as well as flexibility to training providers to offer relevant courses in partnership with potential employers. Rigid, central control will prove detrimental given the changing nature of the labor market.
2. The private sector is keen to seek a strong voice in policies and standard setting, but it is often reluctant to contribute substantially to skills training. National standards are being developed in all the South Asian countries, but smaller training providers are unable to access capital to meet these standards. Options to address this include provision for innovative training funds tied to stimulate demand, job placements, and private sector participation.
3. The more the TVET system targets those most in need of skills training, the more it suffers from negative perception. TVET continues to be perceived as second-class education, leading to different types of mismatches. Options include marketing TVET as a viable option to allow horizontal and vertical mobility and lifelong learning and participation of reputed training providers to boost employability of TVET graduates as well as its image.

4. South Asian countries are growing fast, and their economies are modernizing fast, but the majority of the labor force continues to be trapped in agriculture and informal sector. Consequently, low labor productivity continues to drag the overall productivity although it is improving.
5. It is very encouraging to see the potential of demographic transition, but most of the South Asian countries continue to face high youth unemployment. With high unemployment rates, countries face the prospect of instability. Options to address this include ensuring soft skills from better quality formal education combined with targeted, market responsive skills training in partnership with the private sector.
6. The overall participation and completion of formal education has continued to expand, but the unemployment rates of graduates from schools, skills development, and university education remain high. This situation is largely attributed to poor quality of education at all levels and lack of linkages between education, training, and employment. Options to address this include bridging the gap between formal education, training, and employment, including emphasizing career guidance. This is more feasible within a lifelong learning model.

Opportunities

Skills development is a major priority of all countries in South Asia given the potential to transform the human capital base, similar to how the export-led growth and globalization transformed some of the Southeast Asian economies. How can South Asia respond to the huge needs of skilling and/or up-skilling millions of people?

Transforming the education and training system. Countries in South Asia are growing fast, some more rapidly. Clearly, this requires skilling people to find better jobs and contribute to this transition while moving up the value chain. South Asian countries have to enhance the quality and relevance of education in close collaboration between the education and training institutions and the employers along with evolving a robust labor market information system to reduce the mismatch between *demand and supply* of labor and to complement generic skills with vocational skills.

Ensuring synergy between priority investments and skills development. Due to a low infrastructure base, the South Asian countries have been unable to tap their true potential. But this is changing fast, as South Asian governments are investing huge amounts in infrastructure including energy, transport, and municipal services, to accelerate economic growth rates in their countries. India alone expects to invest around $1 trillion in infrastructure during its 12th five-year plan period (2012–2016). Bangladesh, Nepal, Pakistan, and Sri Lanka are pursuing ambitious projects in infrastructure. However, commensurate investments in human capital are needed to optimize the returns to infrastructure investments,

as these are not addressed systematically. South Asia is urbanizing rapidly, and by 2050, over 50% of the population will live in cities. For a region that is witnessing demographic transition and massive migration from rural areas to urban centers, skills development must use this opportunity as one of the key drivers for skilling and equipping people.

Migrant labor and its contribution. Almost all the South Asian countries rely heavily on remittances from migrant workers, and this has continued to grow over the years as shown in Table 11.4 below. Most of the migrant workers are engaged in unskilled labor that is dangerous and difficult. Many unskilled youths seek jobs abroad amidst chronic labor shortages in their own countries.

India remains the largest recipient of remittances (doubling from $27 billion in 2006 to $55 billion in 2010) from its migrant workers although remittances' share in GDP is less than 3%. While Bangladesh (around 10% of GDP), Pakistan (around 8%), and Sri Lanka (around 8%) rely heavily on remittances, Nepal's dependence has increased at an alarming rate to around 25% of GDP in 2010. Nepal is now among the top ten countries that depend on remittances as a share of GDP. The good news for Nepal is that the proportion of people living below the poverty line has decreased from around 31% in 2003/2004 to around 25% in 2009/2010 (Central Bureau of Statistics 2011), which is largely attributed to remittance income that affects over 50% of the households spread all over the country. Other good news is that migrant labor has reduced the pressure on domestic labor market although this may lead to major structural problems later if not addressed strategically. However, the hidden costs that come with low-skills jobs that are dangerous and difficult may also be quite high; there is very little analysis available on this. Inevitably, people's search for decent income will continue, and migrant work will remain a major source in most South Asian countries for many years. What is critical is to target skills training to those people whose income can easily double or triple within a fairly short period, and such training can also significantly raise the awareness of migrant workers to guard against exploitation and risks.

Table 11.4 Trend in migrant labor and remittances in South Asia

	Bangladesh		India		Nepal		Pakistan		Sri Lanka	
	2006[a]	2010[b]	2006[a]	2010[b]	2006[a]	2010[b]	2006[a]	2010[b]	2006[a]	2010[b]
Remittance (billion)	6.4	12.2	27.0	55.0	1.6	3.5	3.9	9.4	2.2	3.6
Percent of GDP	9.0		2.8		18.0		4.0		8.7	
Emigration (million)	4.9	5.4	10.0	11.4	0.75	0.98	2.2	4.7	0.935	1.8
Labor force (million)	65.0	75.7	443.0	447.0	11.0	11.8	59.0	54.5	8.5	8.9
Dependency ratio	63.0	54.7	59.0	56.3	73.0	68.3	71.0	69.4	45.0	46.5

Source: World Bank (2007, 2011a)

[a]Data refer to either 2006 or close to 2006

[b]Data refer to either 2010 or close to 2010

Sri Lanka has already targeted in its economic plan to more than double its remittance income by skilling and/or up-skilling its migrant labor force.

By providing some basic training to migrant workers and practical experience in their own countries before they go abroad, their income potential could double or even triple in a relatively short period, while the domestic labor market could also become more efficient. Some radical changes in the approach to migrant labor could lead to (1) rapid reduction in poverty and increased demand for quality-basic services and (2) opportunities for benchmarking labor force competencies, leading to requisite improvements in labor quality and productivity.

Regional coordination. South Asia needs to promote regional cooperation in skills development and higher education in order to (1) benchmark standards and establish quality assurance mechanism; (2) promote mutual recognition to optimize the value of labor mobility; (3) provide a mutually beneficial forum for sharing regional and global good practices and innovations on areas such as quality assurance, labor market information system, certification, mutual recognition, training of trainers, and private and employer involvement to address emerging skills shortages; and (4) promote joint collaboration in research and development.

Technology solutions. With a rapid penetration of technologies such as mobile and cheaper tablets, technology solutions provide unprecedented opportunities to leapfrog in education and training. For example, unlike in traditional learning, which was limited to schools or training centers, technology now allows accessing high-quality, free-source materials wherever there is internet access for learners. Technologies also provide promising opportunities for a common learning and/or multiple skills platform. It is now possible to transform learning by targeting the learners directly. South Asia has already started pursuing this, but much more needs to be done. Technology solutions should be at the forefront.

What Can South Asian Countries Learn from Each Other?

South Asian countries can learn from each other about some of the promising developments in the region including those that may not have worked to avoid costly mistakes. India's initiative to create a for-profit market for skills development through the National Skill Development Corporation to train 150 million people by 2022 is a radical one and a potentially big game changer. This is a viable option that needs to be pursued to complement other efforts.

Bangladesh's successful program by the Underprivileged Children's Education Program on accelerated schooling up to grade 8 followed by skills training, leading to decent job placements, provides an excellent example of targeting disadvantaged groups. This is highly relevant for South Asia given its large share of informal and vulnerable working group (77.7%).

Nepal's success in turning its Training Institute for Technical Instruction into a regional center of excellence that is providing customized training to participants from several countries provides a good example of how training of trainers and targeted training can be developed and institutionalized.

Sri Lanka has been reasonably successful in establishing its National Vocational Qualification Framework (NVQF) in a relatively short period. It is now working hard to operationalize it effectively, which will provide important lessons for other countries in South Asia that are pursuing this. Other countries in South Asia are seeking advice from Sri Lanka to set up their own NVQFs. What is now crucial is to operationalize NVQF with the buy-ins from the private sector and employers.

What Can South Asian Countries Learn from Other Regions and Countries?

There are several good practices in skills development from selective countries around the world that are highly relevant to South Asia. The next five paragraphs highlight some good practices that are highly relevant to South Asia.

The Republic of Korea's experience in developing a world class education and training system in a relatively short duration by closely aligning with its economic and industrial policies including a rapid transition to a knowledge economy is highly relevant for South Asia. Such a policy led the Republic of Korea to rise rapidly from a poor country in the 1950s to a promising member when it joined the OECD group in 1996. The Republic of Korea offers relevant good practices in at least four areas: (i) alignment of education and training policy with economic development and industrial policy; (ii) high school vocational education and training, with the establishment of over 20 Meister high schools; (iii) industry-university linkages including training of trainers; and (iv) reform of the junior college system and use of customized curriculum (Choi 2012).

Canada's rich experience in community colleges is another example that is being discussed in India and may soon generate interest in other countries that are struggling to make their secondary and tertiary education more relevant with closer links with the private sector and employers. Community colleges have promising prospects in South Asia as a viable option to proliferating higher education institutions that offer courses largely on humanities and social sciences but whose graduates are unable to decent jobs. If community colleges are recognized as an integral part of higher education, this would allow an effective route for upward mobility for a large percentage of high school graduates. This could also provide targeted training to college and university graduates that lack certain marketable skills.

Singapore's Workforce Development Agency provides another highly relevant example of how Singapore has been successful in transforming its workforce and raising the productivity of its workforce to meet the emerging labor market needs by effectively monitoring the labor market needs. It is crucial to identify emerging opportunities and not just limit to existing jobs.

Given the huge reliance of South Asian countries on remittances of migrant labor, the region can learn a lot from the Philippines' experience in managing a large migrant labor force that is working in over 100 countries around the world in a wide range of skills including nursing, allied health, hospitality industry, and construction work. The Technical Education and Skills Development Authority in the Philippines has rich experience to share on how agreements are forged with relevant overseas agencies that need to import labor.

In addition, there are other countries such as Australia, United Kingdom, and Germany that could provide selective knowledge and expertise in the areas such as developing and operationalizing NVQF for mutual recognition and regional and international benchmarking and sector skills councils to complement NVQF to drive skills development primarily through the private sector, establishing a credible quality assurance and certification system that is recognized around the world through networking and diplomatic relationships, and promoting enterprise-based training which is at a very low level in South Asia.

Lifelong Learning for a Dynamic Education and Training System

Due to the relatively low human capital base of South Asia, including poor quality and high inefficiency (high dropouts, low cycle completion, low employability), it is imperative for South Asian countries to invest significantly in human capital in a strategic way. With increasing access to technology and globalization, it is now possible to gradually evolve a holistic system that is able to address the short-term and long-term needs (quality and higher skills) to sustain high economic growth. It is for this reason investing in lifelong learning is critical for South Asian countries to ensure synergies across the education sector at all levels of education along with close alignment between the education system and economic and industrial policy. This is particularly crucial to gradually raise and sustain labor productivity over a long period.

In the context of South Asia, the key principles of lifelong learning ought to be (1) ensuring that all students are able to complete high-quality basic education of 8 or 9 years to prepare students to move to higher level of education, to transition to skills training, or to transition to jobs that will lead to a decent income; (2) ensuring vertical and horizontal mobility so that students beyond basic education can move horizontally (to work or skills training) or vertically (high-level education, skills acquisition, or progression in jobs) without any dead end; (3) recognizing and providing credits to skills acquired in schools, skills training, or jobs to facilitate people's mobility; (4) explore high-quality materials from different regional and global sources to establish national occupational standards; and (5) gradual benchmarking and mutual recognition within and outside the region to take advantage of the huge global demand for labor due to declining youth population and rising dependency ratio in more advanced countries.

Conclusion and Recommendation

The current debate and developments on skills development raise several pertinent questions that need to be analyzed carefully to ensure optimal impact of skills development:

1. What are the implications on inclusive economic and social development? As argued in this chapter, skills development is vital for accelerating and sustaining high economic growth which is also inclusive. However, it is important to rethink skills development so that the benefits are available to a large number of people, for example, doubling or tripling the income of migrant workers through targeted training that will lead to short-term and long-term benefits.
2. What is the role of the government? The role of the government is important in policy formulation, leveraging financing, quality assurance, providing labor market information, targeting training to disadvantaged groups where the private sector is unlikely to do so, and overall coordination given the fragmentation caused by the involvement of so many ministries. It is more important to engage the private sector and employers in actual delivery and developing relevant content, in developing and operationalizing the qualification framework, and in leveraging financing to mobilize more resources. Ultimately, the challenge is to provide more and better jobs.
3. How to incentivize private sector participation to stimulate demand-driven skills development? Private sector involvement is important in different areas including policy formulation, curriculum development, resource mobilization, on-the-job training, and impact analysis to scale up relevant training. By ensuring placement-linked skills development, the private sector and employers will be inevitably involved.
4. How to raise and distribute funds for skills development in ways that improve performance? There are increasing efforts to link training with job placements. With a more robust LMIS in place, South Asian countries will be able to provide better information to training providers and trainees to develop skills in response to emerging labor market needs. Similarly, those training providers that are able to demonstrate high placement records will attract more trainees; hence, they should receive more funding. The emphasis is on enhancing the demand side.
5. What are the policy directions and implications for skills development? As noted earlier, skills training should be packaged within a lifelong learning system so that soft skills come from formal education and targeted skills development are developed based on more effective LMIS and active involvement of the private sector and employers. This balanced development is critical.

Emerging consensus. Consensus is emerging around some key areas:

1. There are many routes to skills development that should be considered.
2. The TVET system must be flexible to emerging labor market needs.

3. Incentives must be changed to stimulate enterprises and employers to do more to respond to skills needs.
4. There is a need to benchmark quality standards, ensure performance assessment, and establish a credible certification system.
5. The use of technology and open learning systems is essential to provide opportunities to target training flexibly.
6. Labor market analysis and graduate destination surveys are essential for proper direction and feedback to make continuous improvements.

Recommendations. Given the emerging critical questions and consensus noted above, developing countries, particularly those that are still at a lower level of educational attainment, need to seriously rethink how to institutionalize lifelong learning in order to ensure a balanced investment in education and training to enhance the employability of graduates. Global research and progress made by different countries confirm that quantitative growth alone will not lead to meaningful improvements in human capital. The real returns to education come from much better quality education that provides a strong foundation (literacy, numeracy, soft skills) combined with vocational skills. Such a system is feasible if combined with formal, informal, and on-the-job training including recognition of prior learning and knowledge acquired at different learning environment.

Since skills development is spread over various ministries, it is important to take a principled approach to provide funds to programs that are market oriented, regardless of public or private providers, that meet the standards that the employers have subscribed to, and that lead to employment. At the end, it is important to expand the coverage and establish the capacity to skill and/or up-skill millions in South Asia.

Thinking globally and starting locally are crucial. However, by trying to do everything, it may not be possible to transform. There are five considerations. First, pilot and scale up emerging good practices within an evolving lifelong learning model and in the local context by drawing on experiences from the country, region, and beyond to meet the huge unmet demand for high-quality education and training. This includes replicating good models and principles. For example, placement-linked skills development.

Second, develop and harness education and training as a source as well as a priority for much higher economic growth by leveraging public resources and plowing back huge and growing private expenditures on education and training.

Third, integrate and use technology strategically to leapfrog development by continuously innovating and creating synergy between process, product, and skills to move up the value chain to help countries to evolve into a knowledge economy.

Fourth, create innovative funding models to support skills development with required flexibility to fund programs that align well with the emerging priority investments (energy, transport, municipal services, green technologies) and that meet the quality assurance requirements. This will require ensuring synergy between higher education, secondary education, and skills development to ensure a balanced development in required skills at all levels.

And, fifth, create forums and partnerships to discuss and monitor these initiatives to facilitate change and broad-based support.

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Chapter 12
Rural Transformation Index: Measuring Rural–Urban Disparities

Li Wang, Qutub Uddin Khan, and Dian Zhang

Introduction

Since the 1950s, the notion of development has framed our thinking about issues of human well-being and happiness. In this period, several developing countries particularly in the Asia/Pacific region have witnessed unprecedented development. Some countries in this region have modernised at a steady pace. The per capita incomes of a significant population, for example, in Republic of Korea, Singapore, Malaysia, and Thailand, now compare with incomes in the developed world.

Despite these phenomenal developments, it will not be unfair to imagine that we also live in a world with remarkable deprivation, destitution, oppression, increasing inequalities, loss of livelihoods, and new forms of exploitation. In addition to the persistence of poverty and unfulfilled basic and elementary needs, inequality across, between, and within countries appears to be growing. The per cent of population at risk of multidimensional poverty ranges from as low as 0.8% in the Russian Federation to as high as 23.2% in Kenya, and its intensity ranges between 35.3% in the United Arab Emirates to 57.3% in Senegal. The share of the poorest 20% in national consumption decreased dramatically in all the major regions of the world with the exception of the Arab Region where it remained constant. More than 1.4 billion people live in poverty so extreme that they can barely survive, and around 25,000 people die from hunger each day while a new billionaire is created every second day (World Bank 2010).

Overcoming these problems and issues is a part of the exercise of development. As the UNESCO Commission on Culture and Development (UNESCO 1995: pp. 19–21) points out, '*In spite of four decades of development efforts, poverty*

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remains high. Although the proportion of poor people has diminished significantly in all continents except Africa, absolute numbers have increased'. Nearly 40% (2.6 billion) of the world total population (6.46 billion) live in abject poverty (less than US$2.0 a day). Over a billion people have been largely bypassed by the globalisation process. Involuntary poverty and exclusion are unmitigated evils. All development efforts aim at eradicating them and enabling all people to develop their full potential. Yet, all too often in the process of development, it is the poor who shoulder the heaviest burden (Javier Perez de Cuellar 1996: pp. 7–11). That our children, youth, and adults in rural areas bear the major burden of poverty, affecting every aspect of their physical, social, economic, and emotional development, requires no further evidence but also immediate assertive actions.

This chapter suggests a methodological framework for the construction of a *rural transformation index* so as to assess rural–urban differentials and gaps in the overall well-being of people in these areas. The chapter is to investigate rural inequalities and development policies in developing countries. The aims of this chapter are (1) to establish indicators systems that can measure rural transformation (RT) in developing countries and (2) to discuss some of the major implications for achieving coordinated urban–rural development in the future.

Rural People: Some Facts

Rural areas are usually referred to as small, inward-looking, and idyllic communities held together by kinship relations and supporting basic agricultural occupations. The characteristic features that differentiate rural from urban areas include size, particularly areas inhabited by the people, low population density, homogeneity, presence of few social classes, low standard of living, and presence of few/no social amenities such as electricity, pipe-borne water, low social mobility, and mainly agrarian in nature—producing the bulk of food consumed in urban areas and the attendant drifting of young able-men to cities in order to benefit from the urban resources and modern life.

People living in rural areas are characterised by low capital investment, low savings, and low production. The poverty level is usually higher among women than men. Women continue to struggle with dual responsibilities of economic production and domestic labour, while most of them are confronted by poverty, illiteracy, high health risks, inadequate access to productive resources, and lack of credit/market access. Land ownership in rural areas determines the asset for production as well as access to credit and agricultural support services and the social power to negotiate for resources and membership in decision-making agencies. Paradoxically, most developing countries still lack adequate provision for women to hold land rights independently of their husbands or male relatives. Statutory laws often do not ensure independent land rights for women. Also, technological development and extension programmes have not been responsive to household drudgery associated with different production activities undertaken by women. Persisting gender biases, deep-seated community dynamics, and time constraints prevent

women from actively participating in programmes intended to bring about social capital benefits and female empowerment.

Several attempts and approaches have been adopted to bring about rural development. Most of these are top-down approaches which impact little on rural development and most especially on the womenfolk. Usually, community development programmes should aim at creating awareness of rural possibilities; providing information on resources, inputs, and infrastructure; deploying technical assistance; skills acquisition and development; increasing literacy levels; improving productivity and productive systems; and adapting appropriate technology in agriculture; sensitising potential volunteers and donors as well as focusing on peoples' felt needs and basic amenities such as the provision of good roads, electricity, health clinics, markets, school buildings, and farm settlements, among others. An attempt to achieve these laudable goals requires the intervention of good leadership. When good leadership is provided, the people would participate voluntarily in the accomplishment of stated objectives.

A careful study reveals that rural concerns have not been given the predominance they deserve, especially in the cases of South Asia and sub-Saharan Africa, where in demographic terms, national educational problems are largely rural problems. The analysis presented herein highlights the rural scenario and throw up for debate, for introspection, and for the formulation of viable strategies; the raft of challenges that plague the balanced growth of educational facilities; and the delivery of quality education systems.

The analysis serves to highlight the major problem areas and examine in some detail the many constituents of each of them and how the construction of a rural transformation index as a tool to assess and examine extreme rural–urban discrepancies in both socio-economic development and geographical and biophysical conditions. The analysis is replete with charts, graphs, and tables that provide a visual and pictorial representation of what is being stated in the main body of this chapter. There are also examples selected from different research studies which show regions of the world that depict the poignancy of the ground situation and serve to underscore the harsh realities of the rural condition.

Mounting Demographic Pressure

The population of the developing world is still more rural than urban: some 3.1 billion people, or 55% of the total population, live in rural areas. However, between 2020 and 2025, the total rural population will peak and then start to decline, and the developing world's urban population will overtake its rural population. In Latin America and the Caribbean, and in East and Southeast, the number of rural people is already in decline. Elsewhere, the growth of rural populations is slowing. Numbers will start to decline around 2025 in the Middle East and North Africa and in South and Central Asia and around 2045 in sub-Saharan Africa (IFAD 2011). Thus, the population in developing regions will remain predominantly rural until 2020. After

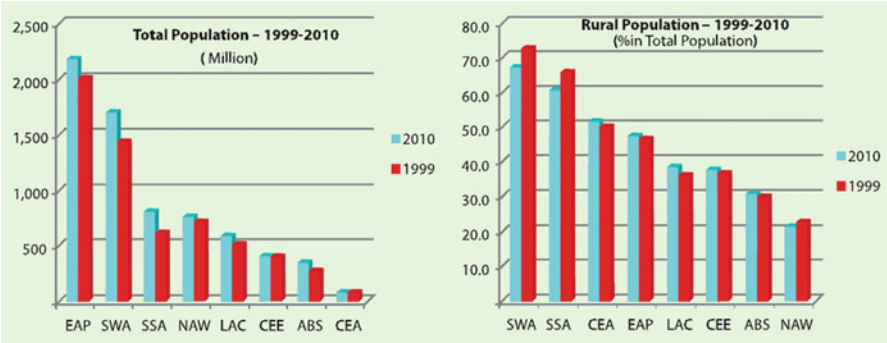

Fig. 12.1 Total and rural population—1999 and 2010

Table 12.1 World[a] population 1999–2010

	Population (Million)			
	Total		Rural population (% in total)	
Regions	1999	2010	1999	2010
Arab States	271.6	347.6	29.9	30.9
Southwest Asia	1,434.6	1,704.2	72.8	67.2
Central and Eastern Europe	401.6	400.6	36.7	37.7
Central Asia	73.3	80.1	50.1	51.5
East Asia and the Pacific	2,006.3	2,176.6	46.7	47.4
Latin America and the Caribbean	508.6	584.8	36.1	38.5
North America and Western Europe	704.2	763.3	22.5	21.3
Sub-Saharan Africa	614.8	807.2	65.8	60.8
World	**6,015.0**	**6,908.7**	**53.1**	**50.1**

Source: *UNDP Human Development Report* (2011). Socio-economic Indicators Table 1
[a]Note: The total of regions may not add to the world total as countries with half a million or less population are not included in the regional totals

that, the size of the rural population is expected to decline due to slower population growth and rapid urbanisation in most countries. The share of the population living in rural areas is declining on all continents (Fig. 12.1), although it is projected to remain above 50% in South and Central Asia and sub-Saharan Africa until 2030 (UN 2008) (Table 12.1).

Figure 12.1 shows that the world population increased from 6 billion in 1999 to 6.9 billion in 2010—the highest increase (269.6 million) being recorded by the Southwest Asian region followed by East Asia and the Pacific (170.3 million). Central and Eastern Europe is the only region recording a decline (one million) in total population reflecting sustained reductions in fertility in this region during the period under consideration.

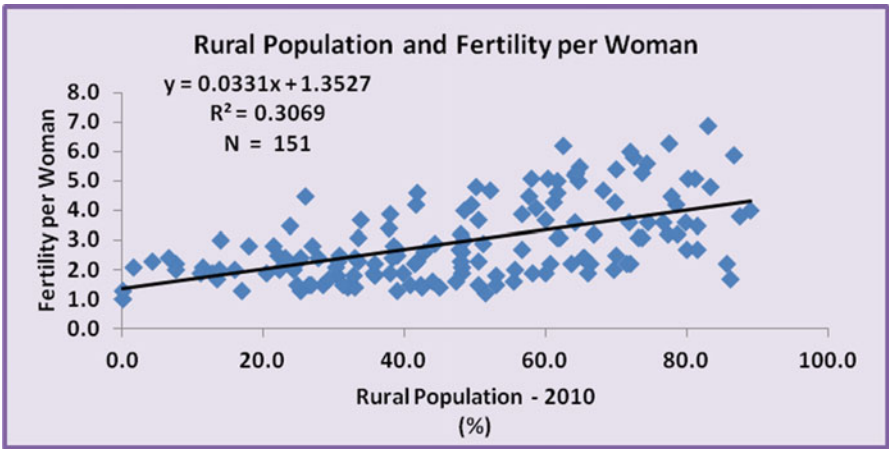

Fig. 12.2 Rural population and fertility per woman

Figure 12.1b represents the proportion of rural population in the total population during 1999–2010. Among the developing regions, Southwest Asia and sub-Saharan Africa are the only regions with mounting rural population. Rural population in these two regions accounts for nearly one-third of total population. Rural population has also grown in the North American and Western European region. However, this increase can be associated with recent efforts in the European Union (EU) towards changes in the concept of rural areas. It is also explained by the prevalence of the current financial crisis; as a result, most migrant workers in European Union are returning back to rural areas (OECD 2008).

Figure 12.2 shows the relationship between rural population and women's fertility. It highlights that high rural population proportions are positively and significantly related with each other. Rural areas are generally characterised with high fertility rates which in turn have historically been strongly correlated with poverty, high childhood mortality rates, low status and educational levels of women, deficiencies in reproductive health services, and inadequate availability and acceptance of contraceptives. Falling fertility rates and the demographic transition are generally associated with improved standards of living, such as increased per capita incomes, increased life expectancy, lowered infant mortality, increased adult literacy, and higher rates of female education and employment.

Even with improved economic conditions, nations, regions, and societies will experience different demographic patterns due to varying cultural influences. The value placed upon large families (especially among underprivileged rural populations in less developed countries who benefit least from the process of development), the assurance of security for the elderly, the ability of women to control reproduction, and the status and rights of women within families and within societies are significant cultural factors affecting family size and the demand for family planning services.

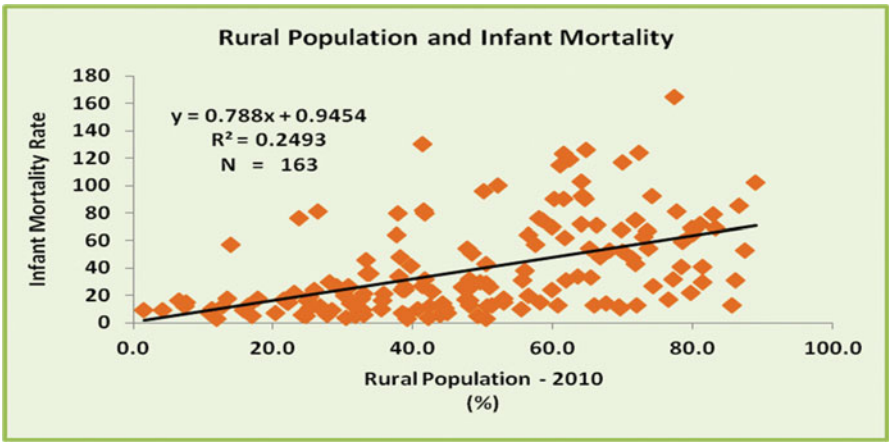

Fig. 12.3 Rural population and infant mortality

Even with a demand for family planning services, the adequate availability of and access to family planning and other reproductive health services are essential in facilitating slowing of the population growth rate. Also, other factors include access to education and the ability of women to determine their own economic security influence their reproductive decisions.

The relationship between infant mortality and size of rural population is shown in Fig. 12.3. The figure clearly shows a significant direct relation between the two. That is, developing countries with high infant mortality rates are those having relatively high rural population.

The World Health Organization (WHO) estimates that in 2005 over 500,000 women died from pregnancy- and birth-related causes. A woman in a developing country is 97 times more likely to die as a result of pregnancy than a woman in a developed country. The majority of these deaths occur during and immediately following birth: 25% are caused by severe bleeding, 15% by infection, 12% by eclampsia (a seizure disorder), and 8% by obstructed labour. The remaining deaths are due to unsafe abortion (13%), other direct causes (8%), and indirect causes such as HIV and malaria which may be aggravated by pregnancy. The technologies needed to prevent deaths from most of these causes exist (WHO 2009).

Figure 12.4 highlights the relationship between rural population and the average expectancy of life. The graph clearly shows a negative relationship between them.

Population ageing is poised to become a major issue in developing countries, which are projected to age swiftly in the first half of the twenty-first century. The proportion of older persons is expected to rise from 8 to 19% by 2050, while that of children will fall from 33 to 22%. This demographic shift presents a major resource challenge. Though developed countries have been able to age gradually, they face challenges resulting from the relationship between ageing and unemployment and sustainability of pension systems, while developing countries face the challenge of simultaneous development and population ageing (UN/DESA 2002).

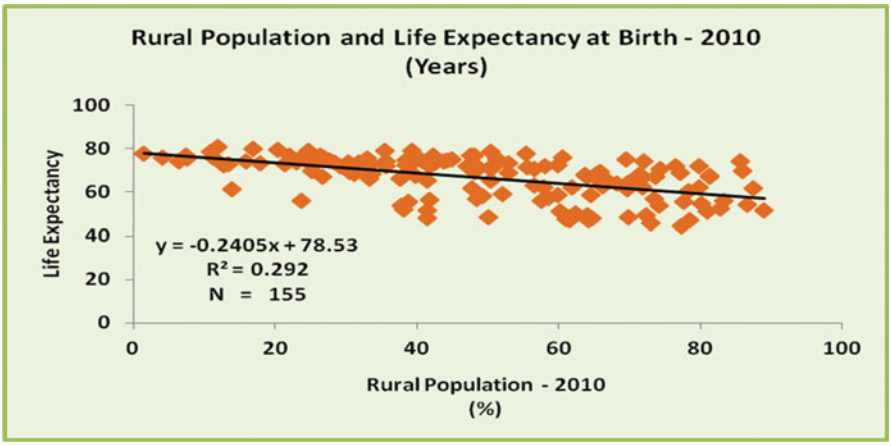

Fig. 12.4 Rural population and life expectancy at birth

While today the overwhelming proportion of older persons in developed countries live in areas classified as urban, the majority of older persons in developing countries live in rural areas. Demographic projections suggest that, by 2025, 82% of the population of developed countries will live in urban areas, while less than half of the population of developing countries will live there. In developing countries, the proportion of older persons in rural areas is higher than in urban areas. Although further study is needed on the relationship between ageing and urbanisation, the trends suggest that in the future in rural areas of many developing countries, there will be a larger population of older persons (UN/DESA 2002).

Significant differences also exist between developed and developing countries in terms of the kinds of households in which older persons live. In developing countries, a large proportion of older persons live in multigenerational households. These differences imply that policy actions will be different in developing and developed countries.

Rural Poverty and Deprivation

The Human Development Index (HDI) decreases with every increase in rural population in developing countries as highlighted in Fig. 12.5. However, it is difficult to demonstrate precisely the magnitude of rural poverty in terms of HDI as it contains several indicators and gives the measurement of development in relation to those indicators.

The Rural Poverty Report 2011 states that ‘today a little less than 35% of the total rural population of developing countries is classified as extremely poor, down from around 54% in 1988; while the corresponding percentage for the US$2/day

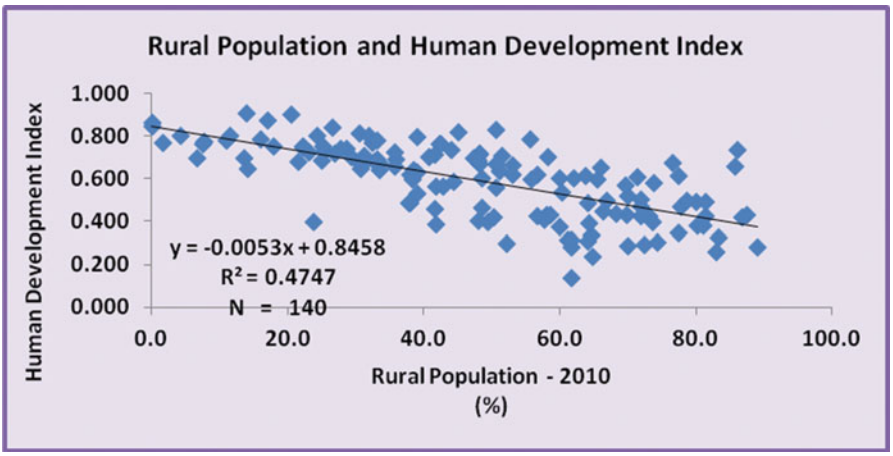

Fig. 12.5 Rural population and Human Development Index

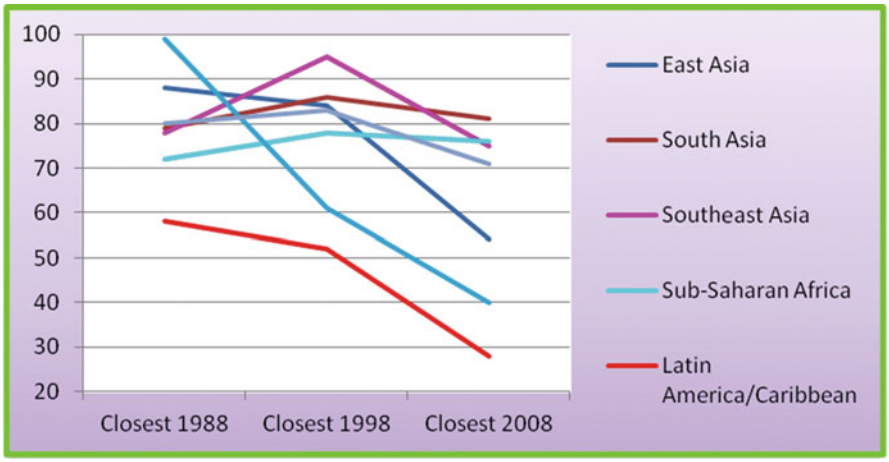

Fig. 12.6 Rural share of total poverty (rural people as percentage of those living on less than US$1.25/day) (Source: Rural Poverty Report, 2011)

poverty line is now just above 60%, down from over 80% in 1988 (Figs. 12.6, 12.7 and 12.8). This is mainly due to a massive reduction in rural poverty in East Asia, where today the incidence of rural poverty is around 15% for the US$1.25/day line and 35% for the US$2/day line.

Rural poverty has declined more slowly in South Asia, where the incidence is still more than 45% for extreme poverty and over 80% for US$2/day poverty, and in sub-Saharan Africa, where more than 60% of the rural population lives on less than US$1.25 a day, and almost 90% lives on less than US$2/day. In Latin America and the Caribbean, and the Middle East and North Africa the incidence of extreme rural

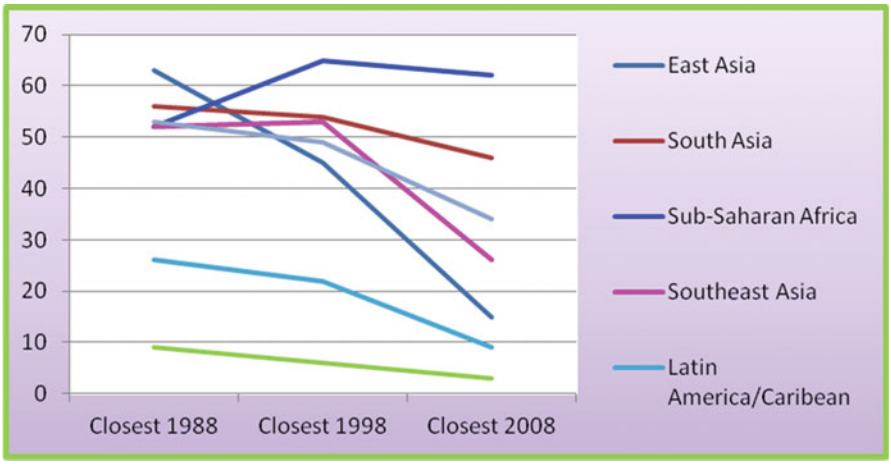

Fig. 12.7 Incidence of extreme rural poverty (percentage of rural people living on less than US$1.25/day) (Source: Rural Poverty Report 2011)

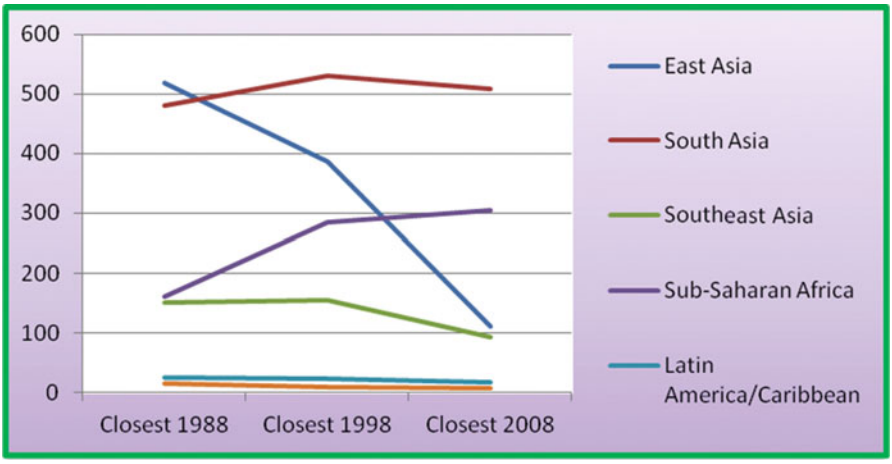

Fig. 12.8 Rural people living in extreme poverty (millions of rural people living on less than US$1.25/day) (Source: Rural Poverty Report 2011)

poverty is less than 10 and 5% respectively, with declines in both regions over the past decade (even though one-fifth of the rural population in Latin America and the Caribbean, and one in eight in the Middle East and North Africa, live on less than US$2/day). Within each region, some countries and subregions performed better than others over the past two decades. In sub-Saharan Africa, for instance, rural poverty declined in much of East and West Africa but increased in Middle Africa; in North Africa rural poverty declined, while it increased in the conflict-affected Middle East (IFAD 2011: pp. 47–48).

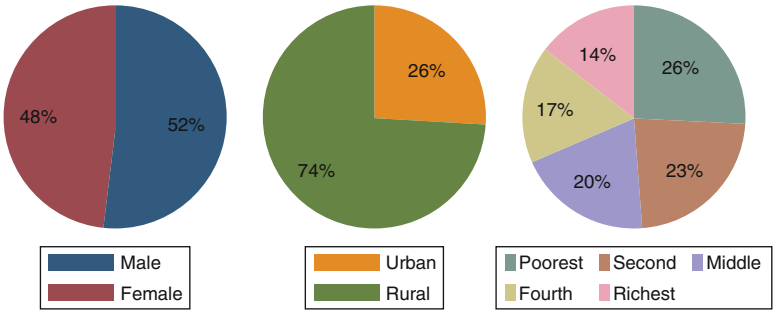

Fig. 12.9 Population of primary school age by sex, area of residence, and wealth quintile, India 2006 (Source: India Demographic and Health Survey 2005–2006)

Despite massive progress in reducing poverty in some parts of the world over the past couple of decades—notably in East Asia—there are still about 1.4 billion people living on less than US$1.25 a day and close to 1 billion people suffering from hunger. At least 70% of the world's very poor people are rural, and a large proportion of the poor and hungry are children and young people (IFAD 2011). Neither of these facts is likely to change in the immediate future, despite widespread urbanisation and demographic changes in all regions. Southwest Asia, with the greatest number of poor rural people, and sub-Saharan Africa, with the highest incidence of rural poverty, are the regions worst affected by poverty and hunger. Levels of poverty vary considerably, however, not just across regions and countries but also within countries.

As mentioned above, nearly one-sixth of the world total population is living in abject poverty and suffering from hunger and illiteracy—majority of them finding their abode in the sub-Saharan African and the Asia/Pacific regions. Within the Millennium Development Goals (MDGs) framework, education and training policies play a crucial role in reducing poverty and ensuring an equitable distribution of economic resources. The UNESCO Education for All Global Monitoring Report 2011 (p.79) estimates worldwide some 72 million children of primary school age are still out of school and over four out of five of them live in rural areas.

A comparison of the composition of the total population of primary school age and the population of children out of school in India, for instance, shows which group of children are disproportionately more likely to miss out on education. Figure 12.9 shows the composition of the Indian population aged 6–10 years. 52% of all children in this age group are boys, and forty-eight percent are girls. About one-quarter of all children of primary school age live in urban areas and the remaining three-quarters in rural areas (Hueber 2007).

Wealth quintiles are constructed by ranking the entire population of India, regardless of age, according to household wealth and dividing them into five equally sized groups with 20% each of the total population. As Fig. 12.10 shows, households from poorer quintiles are more likely to have children than households from richer quintiles. Overall, 26% of all children between 6 and 10 years live in the bottom quintile and a further 23% in the second quintile.

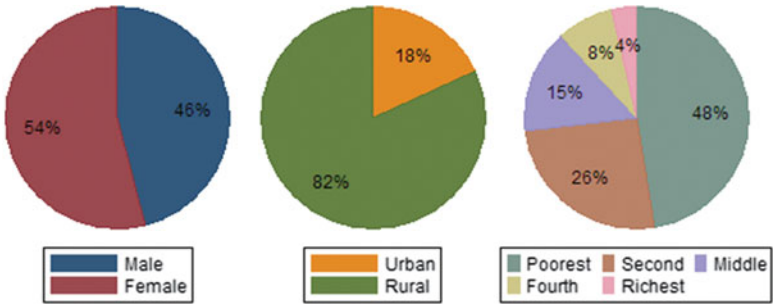

Fig. 12.10 Children of primary school age out of school by sex, area of residence, and wealth quintile, India 2006 (Source: India Demographic and Health Survey 2005–2006)

Figure 12.10 shows the composition of the group of children aged 6–10 years that are out of school in India. Although girls only account for 48% of the total number of children in this age group, they make up 54% of the children out of school. Rural children are disproportionately more likely to be out of school than urban children. Most strikingly, children from the poorest quintile make up almost half of all children out of school. 48%—10 million of the 21 million children out of school—live in the poorest quintile. Seventy-four percent of all children out of school live in the two poorest quintiles.

These numbers emphasise the close link between poverty and school attendance in India. School attendance rates have increased among the poorest households between 2000 and 2006, but the increase was not large enough to keep pace with population growth. Unless India places more emphasis on school attendance among the poor, the country will miss the EFA of universal primary education by 2015.

Who are these victims of development? Indigenous people, women, those living in remote and mountainous regions, slum dwellers living in abysmal living conditions within glitzy metros, young girls and boys lured away from their homes by the promise of jobs, and peasants displaced from their land to make away for large government projects or private concerns, the list is long. Clearly, economic change and developmental priorities have come in conflict with people's right to survive.

Rural areas suffer from outmigration of both young and highly skilled workers, leaving an ageing population, women, and strained public services (including public education). Most areas have difficulty providing the capital and infrastructure to encourage and sustain new rural entrepreneurs. As a result, many rural areas are searching for local features that can spur new growth, such as scenic amenities, environmental virtues, or unique products that reflect the cultural heritage of a particular region. Expanding agricultural opportunities will be important through value-added processing and new specialised crops. Better educated residents and improved rural economic networks are essential to the development of new rural businesses.

Rural populations in the developing countries today have attained high levels of education as compared to their participation rates in 2000, yet rural education still lags urban levels, and large regional and racial differences persist. Rural schools still face a host of challenges, from poverty, under-financing, and isolation to a decreasing pool of experienced teachers and high turnover among teachers and administrators. Many rural schools have successfully met these challenges and are well prepared for the future. Others have failed to meet these challenges and are poorly positioned for the future. In addition, some rural communities are reticent about reform efforts that are not locally initiated, perhaps because of ill-conceived reform efforts of the past. As a result, there is considerable concern among policy makers and educators about the future success of rural schools.

Although rural schools constitute a significant portion of public elementary and secondary education in the developing countries, relatively little is known about them, in part because rural education issues receive little attention from policy makers and scholars. This lack of knowledge puts rural communities and schools at a disadvantage because policy makers often lack the information they need to develop sound policies to assist rural schools.

Contrary to these issues and challenges, the skill requirements of rural jobs, however, continue to rise along with education levels. Although less educated rural adults fared well in the 1990s all over the globe due to positive economic trends, their prospects however are uncertain. Many rural jobs historically held by workers with limited education have been lost to changes in (a) production technology, (b) overseas competition, and (c) changing consumer demand. Prospective employers are increasingly attracted to areas offering a concentration of well-educated and skilled workers, just as better educated youth and adults are still drawn to places—often in cities—that offer better jobs with higher salaries. Although investments in education are not a panacea for places struggling to attract jobs and residents, they can be an important part of a broader economic development strategy.

On average, rural students perform about as well as urban students on national standardised tests. Specialised and advanced course offerings in rural schools are more limited, on average, than in urban schools due to the shortage of (1) appropriately trained teachers and (2) financial constraints. But rural schools often experience closer ties among teachers, parents, and students, fostering a supportive academic environment. It has been observed that educational attainment also varies sharply by race and ethnicity.

Evidence also reveals that education is increasingly rewarded in rural labour markets. The labour market rewards to a college degree have greatly increased in the past 20 years. Rural undergraduates now make more than rural high school dropouts and have far lower unemployment rates. Undergraduates, however, still earn much more in cities, making it harder for rural communities to build their human capital base (World Bank 2010).

Just as urban and rural education levels differ, there is also great variation within and inside rural areas. Low education levels pose a challenge for many rural areas seeking economic development. Raising education levels—and the quality of that education—is essential to improving the economic life of rural communities and

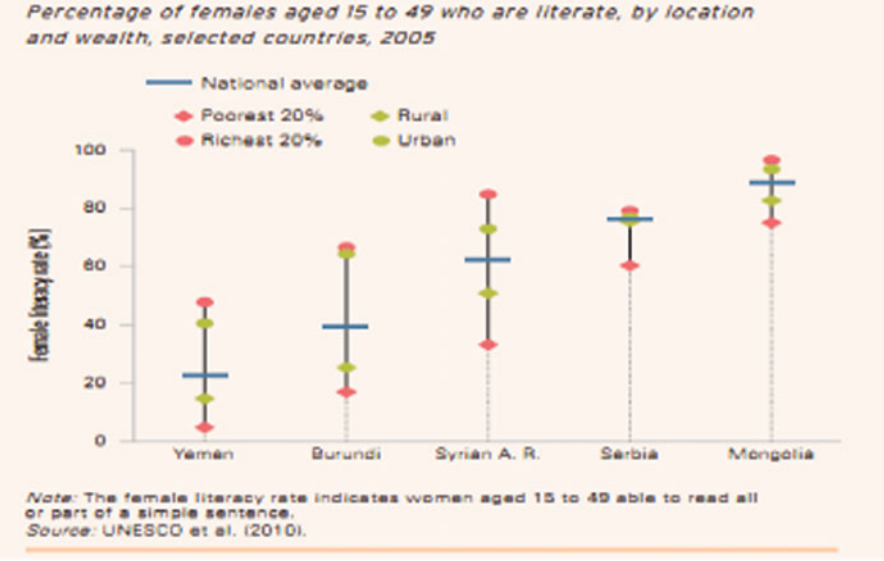

Fig. 12.11 Patterns of literacy are related to household's location and wealth (UNESCO 2010)

the well-being of the rural population. The outmigration of rural youth to places with better job opportunities limits the effects of schooling investments on local communities.

As regards the state of nonformal education in rural areas, almost all the developing countries have made concerted efforts in this direction. Some developing countries (People's Republic of China, Thailand, the Philippines, India, Brazil, Morocco, and Mauritania) have made remarkable progress in planning and implementing nonformal education programmes for addressing rural poverty issues and challenges. However, in a majority of the Arab States (UNESCO 2008), current nonformal education programmes (literacy and adult education) looked upon essentially as 'educational' programmes that address poverty concerns, if at all, only marginally. There are deep-rooted inadequacies in the design and implementation of these programmes. The programme content lacks 'teeth' to address poverty eradication concerns with force. They do not cover the multidimensional needs of the poor and are generally presented as bits of information. The focus is on knowledge, and there is little effort on skill or attitude development. Literacy programmes are organised as single package interventions to impart literacy and numeracy skills only. Traditional rote learning with no opportunity for learners to interact, to analyse information to understand their poverty situation, or to develop decision-making skills characterises the typical adult education learning setting. At best, the empowerment issue is treated marginally and only in the periphery of curricular and pedagogic considerations of most ongoing literacy programmes in these countries. This is clearly shown in Fig. 12.11.

An essential change about which all are agreed is that literacy and numeracy skills alone are quite inadequate and should be accompanied by the acquisition of certain attitudes and knowledge and skills relating not only to vocations and income generation but also to management and social, political, and cultural life. This conception is more than what is implied by functional literacy which countries have been implementing. Functional literacy puts the emphasis on the acquisition of primarily economically and socially useful skills. The need to develop attitudes and values was not at the forefront.

It is felt that attitudes and values are important and critical to the poor in their attempts to better their condition. Even the attempt may not be made without some conviction of their inherent worth and ability and potential. They need to understand their situation and be convinced that it could be changed for better (UNESCO-PROAP 1998). They need to be self-dependent and not other-dependent. The teaching–learning approach should support the development of these desirable values and attitudes. Since the poverty groups tend to be less confident in their abilities and less expressive, the learning approach should encourage them to express their point of view in a mutual atmosphere so that they can be gradually more expressive. No matter how they are, they should also be treated with respect to self-dignity. Values and attitudes need to be supported with thinking and analytical skills (Suvit 1997).

The emphasis on practical skills and not just mere knowledge is from the perspective that the poor may take some meaningful action immediately, under their present conditions without waiting for the day when the situation is expected to improve. If their soil is poor, what may be done immediately about it? What other crops may be grown? Such questions as they have not only need answers but the development of the necessary skills along with the supply of other resources which may be needed. Among the attitudes and skills which need to be further supported, developed, and refined (the poor already have them) are those relating to cooperative action. Management and entrepreneurial skills also need to be developed. This is particularly important if the poor are to take the initiative (UNESCO-PROAP 1998).

The evidence on record demonstrates a pattern of discrimination against and neglect of educational provisions and their quality in rural localities in general and in the Asia-Pacific and sub-Saharan African countries in particular. Far too many children in rural areas of these two major regions are denied basic school facilities including a permanent building, teaching personnel, and learning materials. A near-universal tendency is to overload curricula and syllabi, reflecting an academic view of standards and lack of appreciation of rural conditions. The centralised control of curriculum development and state-produced textbooks—the norms in most countries—fails to recognise the diversity of rural circumstances. Also, the general weakness in governance adversely affects national education systems and harms educational development in rural areas more severely.

On the basis of the above, it can fairly be deduced that (a) consolidation may not be a solution, (b) effective solutions are multidimensional, (c) one-size-fits-all policies are inappropriate, and (d) better understanding of rural issues is needed.

The Origin of Education for Rural Transformation (ERT)

In 2001, the report published by the UNESCO International Research and Training Centre for Rural Education (INRULED) titled '*Education for Rural Transformation: Towards a Policy Framework*' made a plea for rethinking education in rural areas and rural people with a focus on 'rural transformation'.

The term rural transformation—rather than rural development, rural change, or rural education—was used advisedly to convey a vision of proactive and positive process of change and development of rural communities in the context of national and global changes in which education is seen as a key instrument for shaping and fulfilling the goal of rural transformation. However, breakdown of numbers for rural areas on several socio-economic indicators of transformation was often not reported—a sign of neglect of the problem. Urban–rural disparity in educational investments and in the quality of service delivery was widespread *and* persistent (INRULED 2001).

Stockholm Education for Rural Transformation (ERT) Symposium, 2010

In November 2010, the International Symposium on ERT, with the theme of national, international, and comparative perspectives and lessons in ERT, was hosted by University of Stockholm. The general conclusion from Stockholm was clear that in the discourse on policy and strategy and, more importantly, in action, we did not move very much from where we were in 2001. Meanwhile, the challenges became more acute and urgent.

International Fund for Agricultural Development (IFFAD) Rural Poverty Report 2011

The basic premise of this report is that poor rural people find it very difficult to manage the multiple risks they face arising from their personal and household circumstances, the natural and climatic hazards, and economic and development factors at national

and global levels. The rural poor, the majority in most countries, therefore, cannot seize the opportunities in agriculture and the nonfarm economy alike.

Participation in the rural nonfarm economy—both wage employment and nonfarm self-employment—is an important route out of poverty for growing numbers of rural people but has remained neglected by policy makers in many countries.

The report argues for a more systemic approach to growth for rural poverty reduction and 'a new approach to agricultural intensification that is both market-oriented and sustainable'. It also suggests for the construction of a rural transformation index (RTI) to highlight the progress made overtime by rural areas in alleviating poverty and improving the socio-economic condition of rural people. The methodology for constructing the RTI is discussed below.

What Now?

As mentioned earlier, the 2001 report urged UNESCO and INRULED to give priority and be active in building a grand alliance for ERT. It is now necessary to consider critically and objectively how far this has happened and what should be done.

UNESCO–INRULED and their national and international partners need to develop a research, advocacy, and action agenda to build the coalition and promote practices in ERT. Exploration in constructing a 'rural transformation index (RTI)' and its analysis has to be undertaken for understanding analytically the rural–urban disparities and in turn for improving the social and economic development prospects and quality of life of rural people in the context of the changing global scenario. On the basis of this index, a policy framework for programme focus and strategies for developing countries need to be developed and refined.

Construction of a Rural Transformation Index

Why do we need a rural transformation index? What the specific aims, and thus the indicators, of rural transformation should be. First, the RTI should comprise all those variables that present relevant statistical information which support, illustrate, elaborate, and explain as much as possible the key issues and challenges faced by the rural communities in both developed and developing countries. In respect of this aim, the simplest RTI will comprise a statistical analysis listing the countries by proportion of their rural population and showing their ranking on various relevant indicators. However, one of the serious limitations of this index would be its inability to explain and highlight regional discrepancies in both socio-economic development and geographical and biophysical conditions in any given country.

Second, the RTI should try to indicate distinctly the trends, or change the policy makers would like to see, in relevant indicators to show progress or lack of progress in respect of rural transformation, if relevant, reliable disaggregated data by rural–urban breakdown become available on several determinants of transformation for a sufficient number of countries from all developing regions. This can constitute a rural transformation index (RTI).

Among other things, the key message here is the need to move away from the present lopsided growth and development, with majority of the people still in rural areas, employed in agriculture and related informal sector activities, but receiving (and contributing to) a disproportionately low share of GNP and also are characterised by low values in various development indicators.

It should be emphasised that the rural transformation indicators have to be about rural people and rural areas but seen within a national perspective. It can be justifiably argued that there has to be a more balanced growth and development, marked by reduction of three kinds of gaps to overcome the present disparity between the situation of the rural people and the rest in each country. These gaps to be narrowed and eliminated are:

- The gap between per capita rural GDP and per capita national GDP
- The gap between rural HDI and national HDI
- The gap between the ratio of agricultural GDP/total GDP and the ratio of agricultural employment/total employment

If it is agreed that the reduction of these gaps, thus moving towards a balance in development and well-being of rural and urban populations, as the thrust of rural transformation, RTI can be the composite value of these three measures. RTI can indicate the present status of a country and can provide the basis for setting goals for change in various indicators in respect of rural transformation.

Besides looking at the present status, the targets for rural transformation, reflected in indicators, would be to reduce the proportion of people described as rural, to reduce the population employed in agriculture (albeit in a planned and deliberate way), and increase the income level of those who remain in rural areas and in the rural economy, and ensure that they enjoy a higher level of human development, at least equal to the total average national values for HDIs.

Data are available for the rural population by country. To construct RTI,[1] therefore, data are needed for rural GDP, agricultural GDP, and rural HDI

[1] An analogy for the RTI may be the statistical annex of the annual Human Development Report of UNDP and the GMR put out by UNESCO. In the latter case, a set of tables with relevant country data are presented. In addition, GMR has designed an Education Development Index (similar to the Human Development Index of HDR) for countries, and a table with EDI for the countries is presented, placing each country on an international league table.

(or at least components of HDI) to ascertain the gap between the rural and national values of these indicators. We can then take the consolidated averages of these and relate these to ranking of countries by rural population.

Some of the measures of skills used at present relate to quantitative proxies for skills such as years of education or the level of qualification attained. These measures are based on the assumption that each additional year of education and different qualifications represent the same amount and quality of skills regardless of institutions and locations. Moreover, they ignore skills acquired informally and outside the education and training systems.

Increased access to education and training does not necessarily lead to better economic outcomes, as revealed by several research studies (IFAD 2011). In order to make skills supply relevant for the economy, information is needed about demands for skills in the first place. Distribution of employment by education/training background and by occupations provides indications regarding the match between supply and demand. Usually, census and labour force and household surveys provide this kind of information. An important challenge in this regard arises, as noted earlier, from the fact that large parts of the economy are in the informal sector.

A number of measures of economic performance and labour market and health outcomes can provide information on the links between skills and these outcomes. In respect of economic performance, measures could focus on production and productivity growth at the local level for different sectors and types of economic activities. Labour market outcomes are seen in employment, unemployment, and underemployment rates and earnings.

Measures of health outcomes could be about general health and nutrition and disease burdens for specific diseases with high prevalence. Clearly, to be meaningful for the purposes of assessing the role of skills development for rural transformation, it is essential that systems are established to collect these statistics at the local level and consolidated regionally and nationally showing urban–rural breakdown.

It should be noted that in some studies, rural transformation is explained by the inclusion of percentage of the population in employment (or in labour force) and enrolment in vocational/technical education. Regarding labour force, can it be justified that a higher proportion in work force is necessarily a desirable goal? In practical discourse, it is related to the demographic structure of the country. Moreover, cross-country comparability of the data is generally low. Similarly with respect to enrolment in TVET, again the statistics across countries are not very comparable. And thus, it is difficult to say that a higher ratio is necessarily better, especially in the kinds of programmes many countries have. One can see the logic of including this item in studies focusing on skill development. But while doing so, we are making the argument that the kind of formal TVET we have now in many countries is not particularly useful.

Another issue is the use of Human Development Index (HDI) as a measure of rural transformation. HDI subsumes some of the items that are generally presented separately, such as literacy, mortality, and GNP. There may be a value in presenting these separately also in addition to HDI. These statistics primarily make the point that a high proportion of rural population is associated with low human development indicators. These also support the argument that high rural population ratios are both the cause and the consequence of low development indicators of a country. Because of these interactive and complex relationships, simple and rapid urbanisation is not the answer to the problem. The concern which deserves special attention here is how both rural and urban areas are transformed and how the various relevant development indicators are affected and influenced in the desirable direction.

Recognising the importance of a coordinated and strategic approach, OECD has initiated the development of a global skills strategy—a systematic, evidence-based approach to promoting in countries the formulation of sound skills policy and programme development.

Methodological Aspects

Traditionally, rural development is viewed differently by different people, and such the concept is difficult to specify, measure, and evaluate (Kassioumis et al. 2004). The current structure of rural economy and its social systems appear to be much more diverse, complex, sophisticated, and global than those of the last century (Kennedy et al. 2001). Rural development is now seen and considered as a multi-level, multi-actor, and multifaceted process that requires an understanding of the agricultural developmental model, the relationship between agriculture and society, the regional socio-economic structure and rural economic status, individual farm households and their behaviours, and local policies and institutions (Muilu and Rusanen 2003; van der Ploeg et al. 2000; Rizov 2004; Long et al. 2011).

Available evidence suggests that several attempts have been made by researchers to examine and study the issues related to measuring rural development. For instance, during the period 1970–1980, England and Wales developed an index of rurality for local government districts for identifying some of the differences between degrees of rurality. The main components of this index comprised indicators such as population, household amenities, occupational structure, commuting patterns, and the distance to urban centres using the data from 1971 and 1981 censuses (Cloke 1977; Cloke and Edwards 1986). But Cloke himself asserted (Cloke 1994: p.156) that this methodology for indexing and categorising the rural is

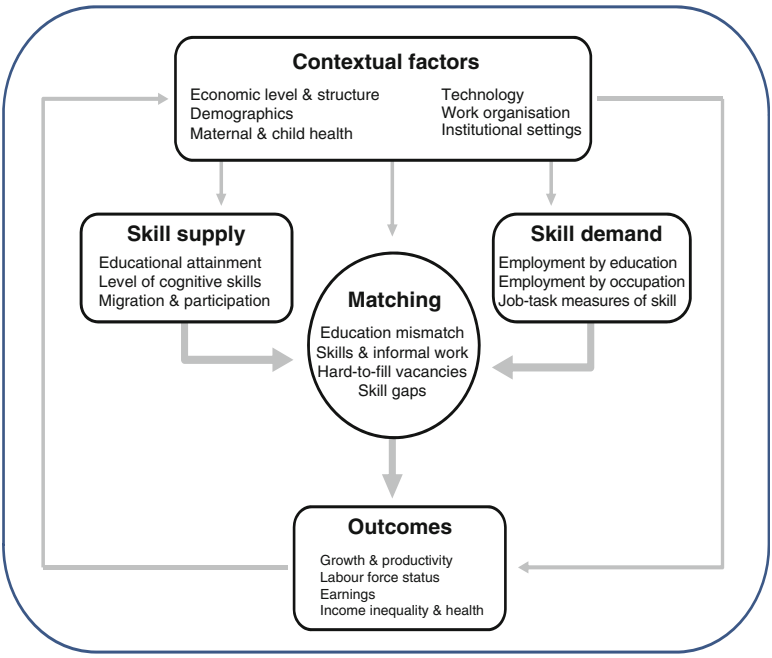

Fig. 12.12 Conceptual framework for the measurement of skills (Source: Hoeckel (undated))

naïve and inappropriate. A similar rurality degree index (RDI) was used to differentiate degrees of rurality in eastern coastal PRC (Long et al. 2009). A corresponding index has also been developed to measure and explain both urban and rural development (Liu et al. 2009; Mann and Smaller 2009).

In their recent efforts, the World Bank and OECD are jointly working on a conceptual framework for the measurement of skills for people in rural transformation. OECD suggests the need for deciding a broad range of measurement instruments to guide skills policies for rural transformation beyond a simple estimation of the stock of skills (expressed in terms of educational attainment) available to an economy at any given point in time. They argue that the process of skills development for rural transformation should involve both the supply and the demand side perspective. The proposed conceptual framework for the measurement of skills covers several dimensions as presented in Fig. 12.12. There are various sources for the supply of skills comprising the education and training system as well as migration of skilled workers and participation in the labour market. The demand for skills on the other hand is affected by a number of factors. Skills measures also need to consider the match of skills demand and supply which in turn will have an impact on economic performance as well as on individual economic and social outcomes. Finally, there are a number of contextual factors underpinning skills development which vary from one country to the other and need to be taken into consideration in the design of skills measures.

Table 12.2 Criteria for the development of skills indicators in least developed countries

Relevance. The indicators should furnish information that provides a useful comparative backdrop for assisting developing countries, particularly least developed countries (LDCs), to identify priorities for skills development and to monitor the impact of their strategies in this regard.
Feasibility. The focus of the indicators should be on those for which data are available for a reasonable number of countries from existing international and national data collections or that are feasible to generate from (low-cost) new data collection initiatives and/or modifications to existing surveys.
Comparability. The indicators should be internationally comparable in concept and measurement. This criterion rules out the use of a number of potential sources such as national employer surveys which are rarely implemented in a comparable way across countries.
Timeliness. The indicators should include those for which data are available or can be collected for a recent year such that the current or future situation in each country is represented in a reasonably accurate manner.

Source: OECD and World Bank (in collaboration with ILO and UNESCO) (forthcoming)

Recognising this need to build up capacity to gather data, OECD has developed an Action Plan which aims to provide a basic indicator framework for monitoring skills issues that should guide least developed countries in the development of their statistical collections according to a set of realistic criteria over the next years (see Table 12.2).

The OECD blueprint provides guidelines for countries or localities not only regarding which kind of information they would need in order to evaluate their current supply and demand of skills, skills match, and outcomes of investment in skills but also on how to deploy this information to support policies that make the most of each country's or region's human capital by nurturing, and using, the skills of its citizens to foster development and promote rural transformation.

Another recent attempt in this direction is by the Chinese Academy of Sciences. The proposed model aims to (1) establish indicator systems that can measure rural transformation development (RTD) in the PRC during the 2000–2008 period, (2) analyse the spatiotemporal characteristics and internal mechanisms of the PRC RTD in the early twenty-first century, and (3) highlight some of the major implications for achieving coordinated urban–rural development (Long et al. 2011).

The term RTD captures changes in traditional rural industries, the employment consumption structure, and the social structure. RTD assessment involves measuring of three major components: the development of a distinctively rural economic system; the transformation of rural social, economic consumption structures; and the improvement of the urban–rural relationship. The relationship among these three critical dimensions is shown in Fig. 12.13.

The study concludes that with the socio-economic development, regional rural development level (RDL) is enhanced, thus promoting the transformation of the rural socio-economic structure, which ultimately affects the progress of regional urban–rural coordination development (URCL). Accordingly, the initial RDL conditions influence the consequent RTL and ultimately change the urban–rural relationship and the regional development patterns (see Fig. 12.13).

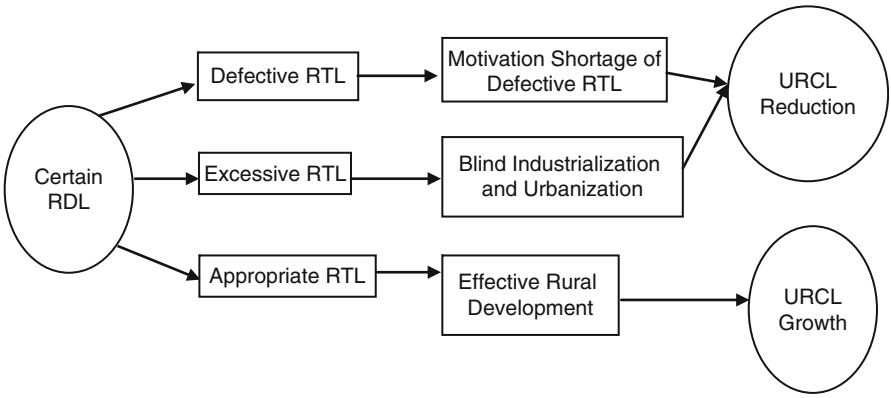

Fig. 12.13 Three Dimensions Measuring RTD, RTL and URCL (Source: Long et al. 2011: p. 1096)

The above approach is designed to measure an improvement in the economic and social life of a specific group of people—the rural poor. Four major factors appear to have influenced the rural transformation: increased concerns about the persistent and deepening of rural poverty, changing views on the meaning of the concept of development itself, emergence of a more diversified rural economy in which rural nonfarm enterprises play an increasingly important role, and increased recognition of the importance of reducing the non-income dimensions of poverty to achieve sustainable improvements in the socio-economic well-being of the poor.

Because regional RTD is composed of three dimensions (RDL, RTL, and URCL), indicator systems corresponding to each dimension have been established to comprehensively measure them. The indicators for RDL measurement (see Table 12.3) reflect changes within the rural society, economy, culture, resources, and environment (Liu et al. 2009). Considering the availability of relative socio-economic data, the model uses eight representative indicators belonging to three rule layer factors: rural economic development, agricultural production investment, and rural livelihood. All of these indicators in Table 12.3 are positively related with regional RDL assessment (Long et al. 2011).

As the variables are expressed in different units, they have to be transformed into comparable common units by normalising all measures. For this, the following Eq. 12.1 is used:

$$X'_{ij} = \frac{X_{ij} - X_{i,\min}}{X_{i,\max} - X_{i,\min}} \tag{12.1}$$

where X'_{ij} is the standardised value of the indicator, ij means the indicator, ij means the indicator i in the rule layer j, X'_{ij} is the value of the indicator ij, $X_{i,\max}$ is the maximum value of indicator ij for all prefectures, and $X_{i,\min}$ is the minimum value of indicator ij for all prefectures.

Table 12.3 Indicator system for rural transformation level (RTL) assessment

Indicator	Definition	Explanation
Urbanisation level change rate	$\frac{UL_l \mid UL_e}{UL_e}$	UL_l = the proportion of the nonagricultural population in the total population for the later period UL_e = UL for the early period A positive indicator: the higher the value, the higher the RTL.
Industrial structure change rate	$\frac{IS_l \mid IS_e}{IS_e}$	IS_l = the proportion of the output value of primary industry in the total gross domestic product for the later period IS_e = IS for the early period. A negative indicator; the lower the value, the higher the RTL
Employment structure change rate	$\frac{ES_l \mid ES_e}{ES_e}$	ES_l = the proportion of labourers employed in farming, forestry, animal husbandry, and fishery among the total labourers for the later period ES_e = ES for the early period. A negative indicator; the lower the value, the higher the RTL
Consumption structure change rate	$\frac{CS_l \mid CS_e}{CS_e}$	CS_l = the Engle coefficient for rural residents for the later period CS_e = CS for the early period. A negative indicator; the lower the value, the higher the RTL
Grain-farmland index change rate	$\frac{GI_l \mid GI_e}{GI_e}$	GI_l = the proportion of grain-crop area in the total crop are for the later period GI_e = GI for the early period. A negative indicator; the lower the value, the higher the RTL
Multi-cropping index change rate	$\frac{MI_l \mid MI_e}{MI_e}$	MI_l = the proportion of the crop are in the area of farmland for the later period MI_e = MI for the early period. A positive indicator; the higher the value, the higher the RTL

Source: Long et al. (2011: p. 1096)

The indicators show relative indices, without dimensions. To render them comparable, values of indicators were ranged from − 1 to 1 using the general normalisation method, according to Eq. 12.2:

$$X'_i = \frac{X_i}{X_{i,\max}} \tag{12.2}$$

where X'_i is the standardised value of the indicator i, X_i is the value of the indicator i, and $X_{i,\max}$ is the maximum value of the absolute value of the indicator i for all prefectures.

After multiplying each negative indicator by − 1, weight and normalised value of each indicator were used to calculate the RDL, RTL, and URCL scores for each prefecture, using the following equations:

$$\mathrm{RDL} = \sum_{j=1}^{n} \left(\sum_{i=1}^{m} \left(x'_{ij} \times W_{ij} \right) \times W_j \right) \tag{12.3}$$

$$\mathrm{RTL} = \sum_{k=1}^{t} X'_k \times W_k \tag{12.4}$$

$$\mathrm{URCL} = \sum_{k=1}^{t} X'_k \times W_K \tag{12.5}$$

where x'_{ij} is the standardised value of the RDL indicator, W_{ij} is the weight for indicator layer factor ij, W_j is weight of rule layer factor j, n is number of the rule layer factors, and m is the number of indicators in each rule layer, is the standardised value of RTL or URCL indicator, and t is the number of RTL or URCL indicators.

On the basis of this methodology, the study established indicator systems for three dimensions used to measure the PRC *rural transformation development (RTD),* the *rural development level (RDL),* and the *urban–rural coordination level (URCL)* during the period 2000–2008.

The model used is significantly appropriate for measuring the regional urban–rural disparities within a given country. When we have to measure and compare rural transformation in various major geographical regions of the world, the following methodology is proposed. The methodology proposed herein is not conclusive and is open for further improvement. Once the disaggregated data on several indicators become available for majority of the developing countries, this model can be used, and its applicability can be assessed.

RTI Model

Rural transformation implies as the movement from agriculture (farm) to manufacturing and then to services. As an economy advances technologically over time, importance of the farm sector in terms of its share in GDP and share in total employment gets reduced and share of other two sectors increase gradually. The question that needs to be analysed is whether the rural economic transformation follows the overall economic transformation or otherwise.

It is worthwhile to highlight those factors which have direct or indirect impact on rural transformation or development. These factors comprise primarily the following: (1) technological progress, (2) commercialisation/capitalisation of farm economy, and (3) urbanisation and globalisation. Improved technology and commercialisation of agriculture, coupled with growing urbanisation and global integration, lead to the growth of the rural nonfarm sector. Though rural nonfarm growth is farm led, however, with growing urbanisation and globalisation, rural nonfarm sector transforms gradually and becomes more and more service oriented. Rural nonfarm sector (RNFS) plays an important role in reducing the widespread

rural poverty through generation of employment and income and creation of effective demand for goods and services. The role becomes important as it can provide diverse employment opportunities to the rural people and in the process, transform the rural economy in the desired direction of inclusive growth (Paul and Biswas undated).

In order to investigate the inter-temporal changes in the structure of a particular variable, a macro index called rural transformation index is suggested. The RTI helps to examine (1) whether the rural economy of a given country has been transformed or tending to be transformed overtime; (2) the pattern and nature of such transformation—whether the importance of the service-sector-oriented activities are on the rise in rural areas or whether the importance of non-service and/or non-agrobusiness has been rising; and (3) whether the role of farm and nonfarm sectors are complementary or substitutable in the context of overall economic development—the interdependence of the farm and nonfarm sector. The methodology for the construction of this type of RTI is presented below. The RTI developed on the basis of this methodology also helps to investigate the inter-temporal changes in the structure of a given indicator.

Let *'a'* and *'b'* be two non-negative vectors denoting two different states of a particular rural development indicator, say, for example, '*x*', θ be the angle between '*a*' and '*b*'. Then

$$\text{Cos}\ \theta = \frac{\sum ab}{||a||||b||} = \frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}} \tag{12.6}$$

$$\text{so that} \quad \theta = \cos^{-1}\left[\frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}}\right] \quad \text{for } a \geq 0, b \geq 0, b \geq 0, ab \geq 0 \tag{12.7}$$

when $\theta = 0°$, then a and b coincide meaning there is no change in the state of the variable x.

When $\theta = 90°$, the angular distance between a and b is 90°; two vectors are perpendicular to each other. Thus,

$$0° \leq \cos^{-1}\left[\frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}}\right] \leq 90° \text{ and then} \tag{12.8}$$

$$0 \quad 90° \leq \cos^{-1}\left[\frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}}\right] \quad 90° \leq 1 \tag{12.9}$$

$$\text{Or } 0 \leq \lambda\ 1, \text{ where } \lambda = \frac{\cos^{-1}\left[\frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}}\right]}{90°} \tag{12.10}$$

λ is called the transformation index. It is unit free and a pure number. Here, in this case *a, b* may be interpreted as vectors of a relevant variable with the stipulation that each element of *a* and *b* denotes the value share in total (ratio) so that $\sum a = 1 = \sum b$. Thus, λ will measure the overall change in the structure of the relevant variable. It is to be noted that the higher the value of λ, the higher is the degree of structural change and vice versa. Likewise, for the vectors (of output/employment) at two time points, $\lambda = 0$ implying no change at all. A value of λ equal to 1 means a complete structural change. Thus, the value of λ ranges between 0 and 1.

Conclusions

Poverty in the developing countries is a predominantly rural phenomenon. The rural poor are not only income poor. They are also deprived of basic necessities. The majority of the rural population is marginalised in terms of access to physical and social assets and in terms of institutions and equality. The rural poor are also capability poor. They lack essential capabilities and have little access to productive assets and instruments to mitigate shocks that affect their well-being and their ability to come out of poverty. Gender and rural–urban differences in human development and poverty are substantial. The agricultural sector, the major source of economic growth, employment, and livelihood, is suffering from low productivity.

Successful strategies for transforming rural areas facing persistent poverty are diverse and context dependent. Rural communities of poverty must be understood in terms of regional and community assets rather than from a deficit analysis. Although many on-the-ground coalitions of partners are working regionally, most are not working at a scale or capacity to achieve and measure outcomes beyond the community level and require assistance in utilising baseline data for measuring their work.

Due to insufficiently formulated demand by the rural population, most extension topics though are still supply side oriented. Rural development is a complex process. It requires simultaneous action in various sectors: agriculture, nonagriculture, infrastructure, and technology, as well as human resource development. It also requires the creation of a dynamic environment for transforming the rural economy. As a result, rural development must be properly integrated into the national economy. New performance measures must be developed to adequately and appropriately measure rural ‘opportunity’ and rural ‘success’. Ministries of rural development alone cannot promote sustainable rural development; a coordinated effort is required.

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Chapter 13
Retire or Rehire: Learning from the Singapore Story

James Yonghwee Lim

Introduction

Overview

To begin, there is an interesting global phenomenon today in population demographics. The world population is aging. Recent demographic figures have for some time showed an increasing trend toward an aging population in both Eastern and Western societies (Kim et al. 2000: 5).

In 2000, at least 10–15% of the population in the Russian Federation, Australia, the People's Republic of China (PRC); Hong Kong, China, New Zealand, the Republic of Korea, and Singapore was 60 years old and above (Nizamuddin 2003: 111–112). In 2010, 13–14% of the United States and Canada's population was above 65 years old (Weeks 2002: 340–341). In 2025, at least 14% of the population of Japan, the PRC, the United States, and the Republic of Korea will be above 65 years old (Bengtson and Putney 2000: 265–266).

In 2040, the population of people who are above 65 years old in Australia, France, Germany, the United Kingdom, the Republic of Korea, Japan, and the United States will range from 22.5 to 35.3% (The OECD Health Project: Long-term Care for Older People 2005: 101). In 2050, the Russian Federation, Australia, the PRC, Hong Kong, China, New Zealand, the Republic of Korea, and Singapore will each reach the point where at least 22–37% of its population is above 60 years old (Nizamuddin 2003: 111–112).

In short, universally our human population is aging. If one were to look at the proportion of the aging population in each country in relation to its population, one

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can conclude that the proportion that is 65 years old and above will form an increasingly significant section of each major society.

The reason for this phenomenon is mostly attributed to the declining birth and death rate in each society (Andrews 1992: 6–10). Simply put, while there is a lower birth rate, people's life span is also at the same time getting longer.

A Demographic Challenge in Singapore

Aging population as a demographic phenomenon is usually associated with developed countries, but this phenomenon is currently of concern to Singapore (Teo 1992: 65–79; Report on the Ageing Population – Five Year Masterplan 2006). According to a report prepared by the National Population Secretariat in Singapore, as of 2008, there were already more than 300,000 people who were above 65 years of age (out of a total of less than five million population size). Singapore had only a narrow window of opportunity in the last few years to put in place elderly-friendly infrastructure and programs to help individuals adapt to aging before the first batch of baby boomers reach 65 years old in 2012 (Report on the Ageing Population – Five Year Masterplan 2006).

By 2030, one in every four persons in Singapore will be 60 years or older, and the increase in the elderly population between 1985 and 2025 will be approximately 348% (Teo 1992: 65–79).

By 2050, according to the World Population Prospects report (2007) prepared by UN Population Division, Singapore is projected to lead this population trend as one of the oldest country in the world. The bottom line is that Singapore is graying fast.

Past ambitious family planning programs – induced abortion, voluntary sterilization, and economic incentives and disincentives (Saw 1984: 145–155) – coupled with low marriage trends in Singapore (Concepcion 1996: 95–96) have not helped to improve the situation. In addition, for many married Singaporeans, the stress of everyday life in Singapore has also not made it easier for them in wanting to have children. With just 35, 100 births in 2004, Singapore maintains one of the lowest birth rates in the world (Hussain 2005). Reversing this demographic trend and maintaining a balanced age structure continues to be a critical issue facing Singapore's policy makers (Concepcion 1996: 95–96). After all, the proportion of the population of working age is an important factor related to the potential of economic growth, and trends are expected to decline steadily in the future for both the more developed and less developed regions (World Population Prospects: The 2006 Revision 2007: 3).

Retirement in Singapore

With an aging population, many governments in the Asia-Pacific Rim region have increased the compulsory retirement age in most occupations in order to ensure sustainable economic development for their economy (Ogawa et al. 1993: 371).

This applies to Singapore today as well. The country's retirement age used to be 55 but was raised to 60 years old in 1993 through the Retirement Age Act (Report

of the Tripartite Committee on the Extension of the Retirement Age 1997: 1). The statutory retirement age was again raised from 60 to 62 years in 1999 (Report of the Tripartite Committee on the Extension of the Retirement Age 1997: 1–15). The long-term objective of the Singapore Government is eventually raising the retirement age progressively to 67 (Report of the Tripartite Committee on the Extension of the Retirement Age 1997: 9). As Singapore tightens control on the number of foreign workers, faces a tighter labor market, and enjoys the good fortune of having residents living longer, it is perhaps prudent to raise the retirement age over time.

Although the retirement age in Singapore has increased, most elderly individuals will in all likelihood still eventually experience retirement at one stage of their life (either on a temporary basis or on a more permanent one). Said differently, for many people in Singapore, one of life's transitional experiences that they undergo when they age is the retirement experience. After all, in our life course from infancy to old age, retirement is one of life's experiences that most of us go through.

At present, particularly older adults in Singapore are willing to work but are nevertheless finding it hard to gain employment as negative attitudes toward older workers are widespread (Teo et al. 2006: 48).

It is widely accepted among Singaporeans that they are "Asset Rich" but "Cash Poor." Accordingly, only 14% of Singaporeans are financially ready for retirement (Koh 2012: 5). In 2011, the International Longevity Centre – Singapore (ILC-S) had put out a report suggesting that the old and childless could not afford to retire (Koh 2012: 5). In Singapore, having at least one child in school is also negatively associated with retirement for older men, perhaps indicating the need to work in helping to finance children's education (Hermalin et al. 2002: 261). After all, Singapore is indeed the world's eighth most expensive cities to live in (Koh 2012: 5).

One of the reasons why older adults in Singapore find it difficult to gain employment is because, as they age, it involves the decline of cognitive, physiological, and/or biological function. This gradual decline of functional ability sometimes invites a negative or contemptuous attitude from the society at large. In 1975, Robert Butler coined the term "ageism" to describe these stereotypes which discriminate against the aged (Kua 1987: 9). Ageism can be destructive, as it robs older people of their sense of accomplishment and limits their choice of alternate employment (Teo et al. 2006: 52–53). Ageist notions are difficult to deconstruct (Teo et al. 2006: 45). It is also worth noting that, in Singapore, mature workers beyond 50 years old do indeed have the highest unemployment rate and took the longest time to secure a job (Koh 2012: 5).

The Tripartite Alliance for Fair Employment Practices (TAFEP) in Singapore was set up to promote fair and merit-based hiring practices, rolling out guidelines to assist companies in recruiting, retraining, and rehiring mature workers.

Recent literature indicates that the present generation of older Singaporean is ambivalent about retirement (Teo et al. 2006: 51). Over 80% of older adults (64 years old and above) in Singapore are not sure if the cessation of work should be mandated by age (Hermalin et al. 2002: 270). Nevertheless, interestingly, more than 83% of Singapore retired men cited mandatory retirement as the reason for stopping work (Hermalin et al. 2002: 268). While this may be an impetus to retiring,

it is also worth noting that the normative expectations of these older adults among the Singapore society are however unclear and totally undefined (Teo et al. 2006: 48). There is still very little known about the preferred age of retirement in Singapore and the attitudes of older Singaporean toward work (Teo et al. 2006: 47).

On the government's part, in responding to Singapore's demographic challenges, one of the strategic thrusts is to help Singaporeans work longer and enhanced their employability for obvious economic, social, and political reasons.

Retirement is after all a social institution. It is an institution that primarily provides an orderly means of easing older workers out of the labor force with minimum financial hardship in view of their past contribution to their economy (Atchley 1982: 264). Retirement has evolved into an important institution that is linked significantly to the economy, politics, and government (Atchley 1982: 265). How retirement as an institution will continue to evolve will depend on which groups are involved in the negotiation process, how powerful they are, what ideologies they pursue, and what constraints they face in the future (Atchley 1982: 286).

Effective from 1 January 2012, employers in Singapore are now required by law to "rehire" employees who have reached the statutory retirement age of 62 till they reached 65. However, in order for this reemployment legislation to apply, these older employees must have worked at least for 3 years with the company and must be medically fit to meet the performance standard of the position.

To further enhance employability for older adults in Singapore, the government introduced a Workfare Income Supplement (WIS) Scheme for older low-wage workers. In order to enhance the employability of older adults in "re-hire-ment," the mandatory social contribution (Central Provident Fund – CPF) rates for older, low-wage workers have been reduced which results in a higher discretionary income for them. But, because the Central Provident Fund contribution consists of both employers and employees' contribution, when the contribution rate in the Central Provident Fund is reduced, these older adults will also indirectly suffer a lower contribution from employers. As such, the government also introduced an additional income supplement to make up for the reduction in their Central Provident Fund so that they can also help build up the retirement savings of older adults, helping to improve the financial position of these older adults and encouraging them further to seek reemployment.

On the national level, there is also a push for a string of work redesign programs to facilitate the redesign of jobs to make available employment opportunities more suitable for older individuals in the marketplace.

Consequently, in Singapore, there are also many older adults who have gone on to take up other jobs which are less stressful and demanding in their transition into retirement when they leave their full-time jobs or careers. Current literature also indicates the transition from a full-time position to a retired status sometimes involves something other than leaving the labor force; it involves part-time employment (bridge jobs) at a lower pay in a new line of work or a new job (Quinn and Burkhauser 1994: 72).

Interestingly, if we examine other developing countries, on the opposite end of the spectrum, observers have in fact even called into question the relevance of the concept of retirement, as a high proportion of the population in developing

countries (excluding Singapore) work in the agricultural sector or family-owned enterprises until late in life, where they adjust their work according to their diminishing health (Hermalin et al. 2002: 231).

Retirement does not necessarily imply having to stop working completely and exit from the workforce. What is important to understand is that retirement relates to jobs and not work; people never stop working; they just retire from positions of employment (Atchley 2000: 240). There is no hiding from work in one form or another, as people create meaning in what they do and how they do it (Whyte 2001: 3). In the broadest sense, when one retires from a position of employment professionally, he or she may still be actively involved in other work socially. Also, how one would define activities that constitute work could also be very subjective.

If over time, retirees in Singapore do continue in wanting to obtain some form of reemployment and increasingly do get "rehired," then it might well be accepted as a norm (or even be expected) for retirees to return to some form of productive work at one point of their retirement life.

Learning in Retirement

People who are easing their way out of a fully engaged career do (and will continue to) grow and experience self-renewal (learning) during those later years, updating assumptions and self-conceptions. This is because individuals will continue to define who they are throughout their life, and their life experiences will continue to influence their self-development. In short, these retirees will inevitably continue to learn even in retirement and experience self-renewal during the later years.

However, all experiences are subjective (Bateson 2002: 28) and self-development in retirement is no exception. This is because both retirement and learning are experienced on an individual level. It is not a universal event that one goes through but more of a process and a life stage that one experiences (Whitbourne 2005: 335). Simply, the typical Singapore older person could experience retirement differently.

After all, aging is a complex process with substantial interaction among many variables (Andrews 1992: 23). As a result, each aged individual will inherently experience retirement differently and attach a different value on self-development as well.

Currently, a huge amount of government resources in Singapore that is aimed at promoting learning for older adults is centered round the strategic thrust of active aging which is part of a larger vision of achieving "Successful Ageing for Singapore." The belief is that leading an active and purposeful life (i.e., active aging) can improve an individual's well-being and reduce the risk of the onset of chronic diseases which, in turn, might enable older Singaporeans to continue to contribute to society – economically or socially. In May 2007, the Council for Third Age (C3A) was established to champion active aging in Singapore and was tasked to administer a $20 million Golden Opportunities (GO!) Fund to promote

community-based projects related to active aging on behalf of the Ministry of Community, Youth and Sports (MCYS). As a result, with the aim of promoting active aging, many wide-ranging learning programs (i.e., learning enrichment programs) have been rolled out by government, quasi-government, and nongovernment organizations – from Peoples' Association (community centers across the city-state) to the Organization of Senior Volunteers (RSVP).

In a separate study conducted by the SIM University (UniSIM) in collaboration with MCYS in Singapore, on a sample population size of 1,500 human subjects, it indicates that when older adults in Singapore think of learning, they tend to think of self-development and personal effectiveness than job- or career-related learning programs (Tan 2008: 6). Simply put, non-career- or non-job-related learning programs enjoy a higher participation rates than career-related programs. This should not be surprising; after all, individuals do have choices, options, and alternatives in choosing learning activities that appeal to their personal motivation and orientation.

However, with the government's mandate of "rehiring" these retirees with the introduction of the new reemployment law in Singapore, there is increasingly more pressure to continue to learn in a work-related and job-related program. Increasingly, it may be necessary to encourage these older adults to participate in job-related learning programs given their need to stay employable for a longer period (Tan 2008: 23).

Learning in "Re-hire-ment"

Interestingly, some of the main reasons why employers in Singapore are shunning older workers are their inadaptability to changes and their low receptiveness toward training at the workplace (Koh 2012: 5). So there is certainly a need to effect changes to improve that particular area if the country is to succeed in getting older adults successfully "rehired." In fact, there remains very little knowledge within gerontology, psychology, and human resource development to help us understand how retirees learn, their motivations for learning, the satisfaction of their learning and their wider impact, etc. – especially on older adults in Singapore. Most of the literature on retirement is on postretirement health, income, and psychological adjustments. Few studies are on the topic of retirees learning for and in "re-hirement" itself.

In retirement, an important element to note is the fact that these retirees can now engage in activities that they never had time for. As the tempo of a full working life comes to a slow down, they now have not only more time but also a better appreciation of life around them and thus can engage in learning activities that they never had time for. This is especially so because many of them are fully conscious of possible termination in their retirement. Interestingly, complementary to this element is Atchley's (1976) assertion that when an individual enters into the

honeymoon stage of the retirement process, he or she usually will try to do all of those things he or she never had time for earlier (pp. 68).

As retirees enjoy the privilege of having more time on their hands and a slower tempo in their retirement life, they do end up having more time to think and reflect. When retirees reflect, it typically involves deep reflection, and it will likely involve more reflection than imagination. In other words, retirees will reflect back on their life experiences more than they imagine what the future would hold for them. In reflecting on their past life experiences, they tend not only to become more realistic about future experiences but also to become more contented with their current blessings in life. In their reflection, these retirees not only exercise reflexivity but also ponder deeply when it comes to issues of interest to them.

For many of them, in their moments of personal reflection, it often centered round the spirituality of life or the meaning of life – not the spirituality of work or meaning of work. In other words, for most retirees, they will reflect and think about their "life," not about their "work."

When an individual is in retirement, he or she is more likely to practice reflection compared to his preretirement period, where more imagination is involved. In our accelerated and action-oriented culture, these moments of self-reflection can often invite a negative or contemptuous attitude from the society at large: what is often called ageism.

For this group of elderly retirees, thinking through the spirituality of life often also involves asking themselves what to expect next. Many of them are realistic and have come to accept the natural next stage of progression in life – the inevitability of termination. This is very real for them. This awareness and consciousness of termination serves as a powerful impetus toward experiencing a paradigm shift – either in valuing health above wealth or in putting the family before everything else.

How meaningful their retirement becomes will not only depend on what meaning they are able to make from their past experiences but more importantly what they want to make of their remaining future.

It is understandable therefore that they value the well-being of their family members as important in retirement and that they are also more selective in choosing their social circle despite more social activities than before. Interestingly, people spend a tremendous amount of time in their productive years pursuing perfection in their "work," but yet, in later years, they are likely to find meaning not in their "work" but in their "life."

The essence of these retirement phenomena illuminated not only each complex strand and the interconnectedness of some of these strands but also their paradoxical elements. For instance, after having lived a full life, people do recognize their possibility of termination in retirement and thus attach great value to the family above many other things. However, while they attach great value to the family, it is paradoxical that this possibility of termination also at the same time makes them value the importance of living a life for themselves rather than for others.

Human development is after all a complex phenomenon, and the reflexivity of these retirees is similarly complex and deep in nature.

Since individuals' retirement experiences involve moments of self-reflection on the spirituality of life, it is therefore likely that any effort to close the mismatch between what retirees want to learn and what might support or be necessary for a successful "re-hire-ment" experience should include identifying ways for individuals to respond to this quest for self-reflection on the spirituality of life (not the spirituality of work per se) when developing appropriate learning programs – seeking a deeper conversation with the self. Since life itself is multidirectional and multicontextual, it is also understandable that people will want to select learning activities that appeal to their personal motivation and orientation, whatever that gives them meaning. Consequently, generally speaking, it is understandable that their interest in learning may not be limited to a job-related skills training program alone.

Retirees do have the time, interest, and motivations to learn. If there are appropriate learning programs in Singapore that appeal to them, it is highly likely that they will participate in these programs. Organizations not only need to understand their learning orientation and interest but also must have the ability to weave those elements into the learning interventions if they are to be successful in getting them to participate in various job-related learning experiences. More adults might see themselves as active learners if adult educators can help them to recognize the many places and ways they can and have gone about learning in adulthood (Merriam and Caffarella 1999: 25).

The Singapore government does recognize the need to continuously improve the quality of these adult learning experiences. Therefore, to that end, as an effort to improve the quality of adult educators in Singapore, the government has invested resources in setting up the Institute of Adult Learning. As a result, a string of certification, assessment, and job-related skills programs have been introduced to corporations and industries. For example, the Advanced Certification in Training and Assessment (ACTA Certification) and the Diploma in Adult and Continuing Education (DACE) have been introduced to industries – on the national level – where adult educators are trained, assessed, and certified based on their ability to meet an industry certification standard in training competence-based programs. Using a systemic approach, for government-funded training programs, the relevant government agency in Singapore would require adult educators delivering the learning interventions to be certified with this credential if training programs are to be eligible for government subsidy payment.

Beyond that, the Singapore government has also invested resources in setting up the Workforce Development Agency (WDA) in strengthening workforce development. However, most learning programs that are developed and delivered by the Workforce Development Agency and its partners are mostly in competency-based job-related skills training (i.e., the Employment and Employability Institute).

However, these institutional investments can also end up as "double-edge swords" as well. This is because, while they do develop and provide learning opportunities to retirees, at the same time, they do also contribute to the institutionalism that governs this institution of retirement. Simply put, these government (or related) institutions are part of that larger institutional template that is being created.

In Singapore, there is a common tendency to think of learning, as narrowly defined, in terms of training for a higher education qualifications or learning in a job-related skills training program (Tan 2008: 2). That in itself is a problem. Learning is much broader than that; it is beyond just attaining a paper qualification or mastering a skill set. While most key learning institutions in Singapore offer job-related skills training, it does not make sense to just train for a specific skill set in today's rapid changing environment. The reality is because these skill sets will very quickly become redundant and irrelevant in the marketplace overtime. Even from an economic-driven point of view, it does the older worker very little good when he or she is trained for a specific job-related skill; knowing the possibility of having that skill set could be redundant over time is real. This is because skills learned in preparations for a job cannot keep pace with the demands of the world of work, and therefore, the ability to learn is a valuable skill in and of itself (Merriam and Caffarella 1999: 11).

If these adults are able to view themselves as competent and active learners, then, they might be better able to address the many life challenges that come in adulthood through formal and informal learning modes (Merriam and Caffarella 1999: 25). It is therefore important for Singapore to have a bigger push in developing learning interventions that addresses the challenge of "learning to learn" than learning a specific job-related skills training. On that note, it is thus imperative for adult educators in organizations to think about "What is meaningful in life?" (spirituality of life) for retirees than "What is important for our work?" when it comes to developing learning interventions in "re-hire-ment."

People come with different lineages, and this may be a development opportunity for many, enhancing their own ability to transform their past experiences. On that note, perhaps faith-based organizations can also collaborate with social agencies to participate in helping to respond to these individual development opportunities for learning in "re-hire-ment."

Conclusion

Singapore as an Asian society indeed can be very different compared to western nations. No two societies share the same problems in all aspects (Yong 1987: 60). While Singapore can learn and emulate from other advanced societies, nevertheless, it should also analyze its own problems and its inherent features (Yong 1987: 60).

Adjustment to retirement is one of the major adaptive tasks of later life for aged individuals, and the degree of success in that adjustment has important interpersonal and intrapersonal implications for a person's total existence (Andrew 1996: 89); this might potentially affect individual development in later years.

Global economics has created rapidly changing work practices at the workplace which requires different kinds of workplace training, and this has shifted the control of adult learning and education to businesses, where there will be increasing

pressure to deliver broad-based workplace learning programs to address economic-driven needs (Merriam and Caffarella 1999: 11).

Today, very few organizations provide preretirement education and learning programs for "re-hire-ment." Such education should ideally be provided to adult individuals not only when they still have the resources to prepare for adjustments to retirement life (before retirement) but also upon retirement when they have the time and motivations to learn in retirement.

Retirement is a major transition in life, and therefore, it should be planned. Individuals can and should indeed not only "learn to retire" but also "retire and learn." There is still much to be done in this learning journey especially with an increasing graying population in Singapore. Hopefully, this chapter has ignited some interest in this topic and had made a small contribution to our body of knowledge in this subject.

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Part III
TVET and the Greening of Economies

Chapter 14
Skills for a Green Economy: Practice, Possibilities, and Prospects

John Fien and Jose Roberto Guevara

Introduction

The drive (though some might say 'drift') towards a greener economy comes from the growing international realisation that past and current 'brown' business-as-usual approaches to development are no longer providing the excess of economic benefits and social progress that they have in the past and so are no longer outweighing their 'negative externalities' and costs in the form of pollution, the run-down of resources and growing social and economic inequalities and vulnerabilities. As the Asian Development Bank (ADB) argues:

> While industrial and agricultural production growth has lifted 521 million people from extreme poverty, progress has been accompanied by increasing pressure on the environmental carrying capacity of the region. (ADB 2011: 1)

Mitigating climate change is often presented as a trade-off between the economy and jobs on the one hand and the environment on the other. However, this is not necessarily the wisest, or most profitable way of looking at the problem. Especially, in the context of the global financial crisis of recent years, major world figures and bodies are now talking about the complementarity of economic and environmental interests. They argue that it is not only possible to have prosperity, jobs and inclusive growth in a low-carbon economy but also that *a low-carbon economy is the only way that we will have prosperity, jobs and inclusive growth in the future*.

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This means that what is now been talked about as ‘green growth’, a ‘green economy’ or a ‘green new deal’ has four interconnected and mutually dependent goals:

- Increasing economic growth
- Reducing unemployment
- Increasing social inclusion and equity
- Reducing greenhouse gas emissions

A 2011 report prepared for the German Ministry of Education and Science argues that working towards these four goals in a synergistic way will reinforce the scope of each one more than if each was acted on separately. Thus, the report argues that increasing the EU’s current emissions reduction target, from 20% to 30% by 2020, would revitalise the European economy, independently of what the rest of the world decides in Durban in terms of climate policy. Seizing that opportunity would increase the size of Europe’s economy by up to 5% over the next decade, increase GDP by €800 billion and create 6 million new jobs by 2020 (Jaeger et al. 2011).

What Is the Green Economy?

The UNEP report, *Green Economy Pathways to Sustainable Development and Poverty Eradication*, defines a green economy as follows:

> UNEP defines a green economy as one that results in *improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.* In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. (UNEP 2011: 1; italics in original)

This interesting form of words, especially those in italics (in original), matches both the focus of the Rio+20 conference and the four goals of the EU report. And this is the interesting thing about the green economy concept. It grew very rapidly and has achieved high level and widespread acceptance and understanding within a very short period of time, unlike its predecessor ‘sustainable development’ which has been subject to widespread (mis-) appropriation, dilution and confusion. There are three dimensions to a green economy. These are:

1. *Widespread respect for, and costing of, ecosystem services* so that the air, water, soils, forests, crops, minerals and energy resources we consume reflect a policy of living off the interest on natural capital rather than widespread borrowing of our share from future generations, thereby mortgaging the future of human society. Figure 14.1 illustrates the breadth of the ecosystem services, just in terms of biodiversity (Column 1), that underpin all development (Column 2) and the economic value of a sample of these services from biodiversity (Column 3).
2. *The dematerialisation of agricultural and industrial processes* will drastically reduce the energy and natural resources that flow through the economy, restrict the rate of resource depletion, reduce pollution and waste, make more efficient

Biodiversity	Ecosystem goods and services (examples)	Economic values (examples)
Ecosystems (variety & extent/area)	· Recreation · Water regulation · Carbon storage	Avoiding GHG emissions by conserving forests: US$ 3.7 trillion (NPV)[23]
Species (diversity & abundance)	· Food, fibre, fuel · Design inspiration · Pollination	Contribution of insect pollinators to agricultural output: ~US$ 190 billion/year[24]
Genes (variability & population)	· Medicinal discovery · Disease resistance · Adaptive capacity	25%-50% of the US$ 640 billion pharmaceutical market is derived from genetic resources[25]

Fig. 14.1 Biodiversity ecosystem services underpinning a green economy
Source: UNEP (2011) p. 8.

use of energy and mitigate CO2 emissions into the atmosphere, thereby addressing human-induced contributions to global warming.
Dominic Barton, Managing Director of McKinsey & Company for Asia, argues that

> Over the next 5 years, we expect Asian governments to focus on 'green growth'. This will be driven by energy security and resource sustainability overall, as well as by economic and environmental sustainability — including the global response to climate change. (Barton 2010)

He argues that both governments and businesses will move forward together on this through public–private partnerships that mobilise capital for low-carbon investment and innovations in resource productivity and energy efficiency, as well as by consumer demand and the setting of market prices for previously 'free' natural resources. Indeed, he argues that 'the push for green growth will create real market prices for resources previously considered free, cheap or external to the market–principally carbon, but also water, forested land, waste and biodiversity' and that this will 'have a seismic impact on global markets and ways of doing business'.

3. *An insistence on social equity and inclusion through clean and decent jobs.* The UNEP *Green Economy Pathways* report found what it described as an 'inextricable link between poverty eradication and better maintenance and conservation of the ecological commons, arising from the benefit flows from natural capital that are received directly by the poor' (UNEP 2011: 6). For example, the ILO reports on the National Rural Employment Guarantee Scheme (NREGS) in India. This public work programme enhances the livelihood security of rural households by providing at least 100 days of paid work each year to qualified households. The conservation of ecosystem services is a major feature of the programme and includes work in water conservation, drought-proofing (including plantation and afforestation), flood protection, small-scale irrigation, horticulture and land development – and involved over 3 billion workdays across 59 million families in 2009–2010.

However, despite this example, four key points can be made about the transition to a green economy:

Firstly, government-funded work is not where most green jobs will be. We used the Indian example just to show the potential of green work to support poverty reduction programmes.

Secondly, many green jobs will be highly skilled and will be found in cities in areas such as construction, energy and water utilities, transport and manufacturing, as well as the countryside.

Thirdly, whether in cities or the countryside, many of these jobs are in less-well-regulated sectors and thus have poor health and safety records and industrial conditions. A green economy must address these issues to provide what the ILO calls 'clean and decent work'.

Finally, there is a gender equity dimension to jobs in a green economy. Indeed, the International Labor Foundation for Sustainable Development (Sustainlabour) argues that the green economy should:

- Aim to satisfy human needs: providing universal access to water, food, health, housing, education, transport and culture
- Be based on justice: be capable of distributing the costs and benefits fairly, between and within countries
- Be inclusive: young people, women. . .everyone must be part of it!
- Be a real economy: do away with the speculative economy and the economic, financial and real estate bubbles
- Be based on the four pillars of the Decent Work Agenda: full employment, guarantee labour and trade union rights, social protection and dialogue and participation (Sustainlabour 2011)

These important criteria remind us of the key definition of a green economy as one that 'results in *improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive' (UNEP 2011: 1; italics in original)

Green Jobs, Green Skills, and TVET

This social dimension of a green economy draws attention to the area of human capital formation. Thus, the ILO International Institute for Labor Studies (2011) argues that

> This will require that the existing education system and vocational training system be capable of equipping future workers and small and medium-sized businesses with the requisite breadth of competences needed to take full advantage of the new technologies. In particular, mechanisms to facilitate the effective generation and transmission of knowledge between higher education institutions and business will be central. . .. If the right human capital strategies are implemented, a green economy can unlock the potential of higher employment, better employment conditions and higher resource productivity. (p. 6)

A significant barrier, however, to developing appropriate human capital strategies is a widespread lack of clarity about what green jobs actually are, and until you know what jobs are involved, it is very difficult to identify the sort of training that needs to be planned and provided. Thus, Wilson (2009) argues that it may be more helpful to think in terms of green skills for jobs and that these might be classified in the following way:

- Existing jobs will all require additional skill sets related to ethics and sustainability. Some will be affected more than others, requiring new expertise and some new technical skills – trades and engineering, for example.
- New jobs in existing industries which derive from the climate change adaptation initiatives – new mix of technical skills plus ethics, as might be found in mining or construction industries.
- New and expanded industries using existing technical skills plus ethical understanding and new technical skills, such as might be found in renewable energy sources.
- New and expanded industries using new occupations (technical skills plus ethics and sustainability, yet to be developed) (p. 2).

Skills development for employability and sustainability has received major attention in recent years, beginning with the UNESCO Intergovernmental Conference on TVET in the Republic of Korea in 1999 (UNESCO 1999) and continued by the work of UNESCO-UNEVOC International Centre. These initiatives are well summarised in UNESCO-UNEVOC's TVETipedia (2011), its 2004 Bonn Declaration and its publication *Reorienting Technical and Vocational Education for Sustainable Development* (Fien and Wilson, 2004). And case studies of ways in which governments and TVET systems around the world are beginning to respond may be found in a book, its commissioned book, *Work, Learning and Sustainability* (Fien et al. 2008).

Case Studies

We would like to illustrate the range of pathways to promoting skills for a green economy through two case studies. The first is of the Green Skills Agreement and associated initiatives being implemented by the Australian government. The second draws from the work of the regional NGO, Asia South Pacific Association for Basic and Adult Education (ASPBAE).

Australian Green Skills Agreement

A 2009 survey by the programme of nearly 2,000 employers in Australia indicated that nearly half of all businesses surveyed (approximately 48%) said they had been affected by environmental or sustainability issues in the last 12 months, either

'slightly', 'quite a bit' or 'a lot'. Some industries were much more strongly affected than others, especially in construction, mining and electrical industries.

When asked what these effects were, they identified three factors:

- Rising costs of compliance, energy or other factors related to environmental issues and changing environmental standards in their industries
- Ethical considerations: ethical considerations were a significant consideration for almost half (49%) of the businesses responding to this question
- Government legislation, regulations

When asked if they expected environmental and sustainability issues to affect their *skills needs* over the following 12 months, about a quarter said they thought their business would be affected. There was a high level of uncertainty in this period, with about 20% selecting 'don't know'. However, comparatively more respondents (38%) thought there would be a skills impact in the next 3–5 years.

This is the background against which a Green Skills Agreement has been forged in Australia, involving the Australian and state and territory governments, employer and employee representatives, the VET sector and community organisations. The aim of the agreement is to build the capacity of the VET sector to deliver the skills for sustainability required in the workplace that will enable individuals, businesses and communities to adjust to, and prosper in, a sustainable, low-carbon economy. The objectives of the agreement are:

- To develop national standards in skills for sustainability within the requirements of the national regulatory framework
- To upskill VET practitioners so they can provide effective training and facilitation in skills for sustainability
- To undertake a strategic review of Training Packages (sets of nationally endorsed standards and qualifications for recognising and assessing people's skills) to embed sustainability knowledge, skills and principles
- To implement a transition strategy to reskill vulnerable workers

A number of programmes have been developed to meet these objectives. These include:

- *A National VET Sector Sustainability Action Plan* (NVSSAP) 2009–2012 was developed in 2009.
- The Australian Government established a *Teaching and Learning Capital Fund for Vocational Education and Training* (VET) valued at $500 million to modernise and improve the quality and sustainability of VET buildings.
- *A Skills for the Carbon Challenge* provides national leadership in building the capacity of the tertiary education sector to supply the skills needed for workers and businesses to prosper in a low-carbon economy. This involves:
- Investing in research to develop a better understanding of the underlying skills issues associated with the transition to a low-carbon economy and appropriate responses

- Presenting the skills for sustainability – Educational Institution Award to encourage excellence in the delivery of education and training for sustainability
- *A Clean Energy and Other Skills Package* is investing $32 million over 4 years to enable tradespeople and professionals in key industries to develop the skills needed to deliver clean energy services, products and advice to Australian communities and businesses.

Asia South Pacific Association for Basic and Adult Education (ASPBAE)

An ASPBAE study of TVET in the Philippines conducted by Magpusao (2011) observed that the increasing demand from the labour market for individuals with technical and vocational skills has resulted in the TVET pathway being more aggressively promoted. This was equally a response to the demand from the business community to address the mismatch between education provision and the needs of the market. The 'Education Highway' programme of the former President Gloria Macapagal-Arroyo argued that generating employment through vocational-technical skills enhancement is one of the strategies need to improve the economy.

As a result, the youth were encouraged to consider TVET as a pathway to greater job opportunities and higher incomes. This was not limited to those from poorer backgrounds but was promoted through the introduction of vocational-technical secondary schools and career assessments to evaluate a student's ability for either professional work or vocational-technical work. However, despite the political promotion, in practice, secondary schools continued to provide poor-quality TVET.

While the government's Technical Education and Skills Development Authority (TESDA) offered quality training TVET programmes, the limited number of TESDA centres and service providers at the community level has made these programmes inaccessible. The prerequisite that TESDA students must be high school graduates made such programmes even more inaccessible to many Filipinos given that 51% of Filipinos are, at most, elementary graduates and almost 30% of school-age secondary students drop out of school.

The study observed that nonformal and community-based TVET training programmes conducted by NGOs for marginalised individuals tended to be more innovative and effective as a poverty alleviation strategy. Those unable to attend the formally accredited TVET programmes, like out-of-school youths and poor women and men, are able to participate because the high school diploma requirement is usually waived. Furthermore, NGO training programmes tend to integrate other elements, such as microfinance support programmes that may be linked with institutions both locally and overseas. However, the disadvantage is that these more accessible and integrated programmes are often dependent on funds from overseas aid agencies, which impacts on their long-term sustainability.

E-Net Philippines, a civil society network that advocates for education reform in the Philippines, '*believes that TVET should be approached within the framework of Education for All Goals, specifically under Goal 3 where the commitment is to provide appropriate learning interventions for youth and adult especially for the poor and marginalised*'.

Finally, the study concluded that if TVET is to truly contribute to poverty alleviation in the Philippines, it cannot be seen as a short-term solution to unemployment but should be grounded in the country's sustainable development framework. TVET must adapt to the rapidly changing demands of the labour market without focusing solely on the global need for service sector labourers. Finally, it must be viewed from a lifelong learning perspective, not just to develop skills to improving income but skills to improve lives.

Summary and Conclusion

Transitioning to a 'green economy' is more than a short-term response to current global crises. It can be a long-term strategy for sustainable development and poverty alleviation.

A 'green economy' has four interconnected and mutually dependent goals: increasing economic growth, alleviating poverty by reducing unemployment, increasing social inclusion and equity, and reducing greenhouse gas emissions.

Achieving these goals will require existing education and vocational training systems to be capable of equipping all individuals with the requisite breadth of competencies needed to take full advantage of the opportunities being generated by the 'green economy'.

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Chapter 15
Education and Skills in Asia: Responding to Greening Economies

Shanti Jagannathan

Introduction

Countries in Asia and the Pacific have recorded spectacular growth rates that have been much celebrated, as they not only contributed to reducing poverty rates in the region but also to a shift in balance of economic power to Asia. A number of countries in Asia are reaching and surpassing middle income levels. The high growth rates are accompanied by concerns regarding environmental sustainability as the region also recorded marked adverse trends of reduced water and air quality, depleted natural resources, and threats to biodiversity. In 2005, the Asia and Pacific region required three times more resources than the rest of the world to create one unit of GDP. Asia's use of raw materials reached a world-leading 35 billion tons and can reach a figure of 80 billion tons by 2050. Asia Pacific's share of global energy demand was about 35% in 2005 and expected to reach 50% by 2028. Several studies point to Asia being the single largest source of black carbon emissions from combustion. There is an urgent need for the Asia and the Pacific region to consider resource efficiency of using fewer resources per unit of GDP to ensure the region's continued growth and sustainable development.

Asia has joined other parts of the world to put in place measures for climate change mitigation and adaptation. International commitments to climate change have contributed to "greening" of economies and corporations. The lead up to the recent Rio+20 Conference on Sustainable Development spurred a spate of initiatives and actions to reinforce a growth paradigm that integrates environment-friendly and sustainability features. There is now a considerable body of analytical work that provides compelling arguments for a transition to greener growth without

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compromising on rates of growth. A recent ADB report (2012b) notes that with the right policies and incentives, "greening" the economy can be made viable and profitable in the long term. An ILO report (2012) states that the transformation to a greener economy could generate 15–60 million additional jobs over the next 2 decades and lift tens of millions of workers out of poverty.

In fact, it is argued that greening growth is necessary, efficient, and affordable. Green growth is seen as a way to pursue economic growth and development while preventing environmental degradation, biodiversity loss, and unsustainable natural resource use (OECD 2010). The World Bank argues that what is needed is green growth that is efficient in terms of use of natural resources, clean in minimizing pollution and environmental impacts, and resilient in taking into account environmental management and natural capital and in preventing physical disasters (World Bank 2012b). Sustained growth is necessary to achieve the urgent development needs of the world's poor, and it is believed that substantial scope exists for growing cleaner without growing slower.

There are ongoing discussions on the development of internationally agreed goals that incorporate sustainability principles, and it is expected that the Millennium Development Goals (MDGs) that have established targets till 2015 will be replaced or complemented with Sustainable Development Goals (SDGs). The transition to green economy will require new indicators that go beyond income poverty and GDP to a broader way of tracking economic, social, and environment progress and well-being.

Education and training have a crucial role to play in the successful transition of economies to green and clean development that is conducive to inclusive growth. Yet, there is no systematic and comprehensive approach to linking education and training policies with climate change adaptation, mitigation, and greening policies. Article 6 of the UN Framework Convention on Climate Change (UNFCCC) attributed only a minor role for education and training in terms of awareness to win public support for climate change policies.

Education institutions can contribute to R&D, to advances in technology, and to measuring and monitoring impact of climate change on occupations. They can help with setting standards, training of trainers, and certification in technical protocols concerned with climate change adapting/mitigating processes. Adequately trained and skilled workers would facilitate faster technology absorption and can help corporations to adopt "greening" strategies. The building up of a cadre of "green professionals" will provide the knowledge base necessary to blend technology, product, and process development with finance and marketing to open up cost-effective options and to speed up implementation. Investing in education constitutes a critical long-term strategy to facilitate changes in consumption and behavior patterns that contribute to sustainable and climate-resilient progress. The far-reaching influence of education and training in advancing policy commitments and policy options for climate change has so far been underestimated. Addressing issues related to skills for greening economies is the theme of this chapter.

Drivers of Change Toward Greener Economies

Prominent Trends and Developments

It is believed that, if done right, moving to a low-carbon world can realize three significant benefits: reduced emissions, higher productivity of the economy, and inclusive growth. The most prominent aspects of a "green" transition include the following:

- Transition to greater use of energy from renewable sources – these could include solar, wind, biomass, geothermal, ocean, hydropower, landfill gas, and municipal solid waste.
- Transition to greater use of products and services that increase energy efficiency – these include energy-efficient equipment, appliances, vehicles, as well as products and services that improve the energy efficiency of buildings and the efficiency of energy storage and distribution, such as smart grid technologies.
- Transition to greater use of processes that reduce/remove pollution and greenhouse gas emission and transition to recycling and reuse.
- Transition to greater use of products and services that conserve natural resources – these include organic agriculture, sustainable forestry, land and soil management, soil and wildlife conservation, and water management.
- Transition to greater use of products and services that comply with environmental regulations and standards.

The slow but inexorable move toward greening economies is being propelled by climate change mitigation and adaptation commitments, the recognition of a business case in green economies, consumer preferences, and prospects of increasing quality employment.

Climate Change Adaptation and Mitigation Commitments

The Asia and the Pacific region is highly vulnerable to the adverse effects of climate change with more people at risk than any other region. Accelerated implementation of adaptation and mitigation measures for climate change will have far-reaching changes in manufacturing and goods and services and labor markets. There would be a shift in demand, output, and employment away from energy generation from fossil fuels such as coal, oil, and gas. Sustaining economic growth without compromising the environment is a policy challenge that Asia has begun to address. Awareness is increasing that green growth approaches are economically and politically feasible and profitable. Several governments are building solid policy foundations toward green growth.

The Clean Development Mechanism (CDM) is a market-based mechanism under the Kyoto Protocol used by countries to meet commitments to limit or reduce their greenhouse gas emissions (GHGs) in order to meet their emission targets.

It has been operational since the beginning of 2006. As of mid-2012, there were 10,426 projects in the CDM pipeline. Although CDM projects are hosted globally, Asia and the Pacific host most of the CDM's projects, and in particular, the People's Republic of China (PRC) and India dominate the CDM market.

Sustainable energy has been a major aspect of the move toward green economies and the proposed UN goal of doubling the share of the world's energy supplied by renewable sources from 15% to 30% by 2030, and doubling the rate of improvement in energy efficiency is spurring nations to innovate and find new solutions. This is particularly crucial for Asia and the Pacific region. Energy demand in the region is rising and is estimated at grow at 2.4% annually till 2030, compared with the projected global rate of 1.5% for the same period. It is thus important for Asia to address actions to ensure energy efficiency, development of renewable energy, and energy security in Asia and the Pacific.

Accordingly, countries are formulating regulations, standards, and targets for renewable energy. The PRC has set a target of reaching 15% of energy supply from renewables by 2020 and the European Union has a target of 20% for the same period. The United States plans to generate 35 billion gallons of alternative fuels in 2017. Governments are offering subsidies and other domestic support mechanisms to promote renewable energy and subsidies to solar energy and biofuels are common in many developed and developing countries. Governments are also adopting green procurement policies in several countries. All these developments provide an added boost to the shift to greening economies by economic actors.

Business Case for Greening

Investment in the green economy is not only considered good for the environment but also for business (World Bank 2010). Companies are moving to non-fossil fuel energy sources as a long-term measure which would also help to improve the image of the company and corporate branding. The notion of a triple bottom line, financial, social, and environmental, has gained much ground in business. The Economics of Ecosystems and Biodiversity (TEEB) Report for Business highlights the business case for biodiversity and ecosystem services (BES) and offers business models in this segment as they are clearly emerging alongside carbon markets. It identifies sustainable management of forests and enhancement of carbon stock initiatives as market opportunities.

A cleantech revolution is believed to be underway much like the digital and Internet revolution. Over 2000 corporations have links with cleantech innovation – as investors in cleantech funds and as partners, licensees, or acquirers of upcoming clean technology companies. With increasing capital flowing into green technology, clean energy could become an accepted part of business thinking. Vision 2050 of the World Business Council for Sustainable Development offers alternatives to "business as usual" that reduce the ecological footprint of development. The US Bureau of Labor Statistics has identified 333 industries (http://www.nationalskillscoalition.org/pdf.html?file=http://www.bls.gov/green/final_green_def_8242010_pub.pdf), covering

more than 2 million establishments, which are likely to produce green goods and services. For business, adopting green strategies helps to remain relevant in the market, participate in growth segments, and realize new business opportunities.

There are examples from both developed and developing countries that demonstrate how integrating sustainability into core business activities can generate a positive return on investment (UNEP 2012). Companies that proactively participate in, perhaps even lead, the green transition will gain business benefits. There are now compelling empirical data to demonstrate that business strategies that integrate attributes of resource efficient and green economy principles can positively affect the financial metrics of companies of all sizes. Businesses that are early entrants in the use of such strategies are expected to strengthen their competitive advantage. It is estimated that the annual financing demand required to create the green economy is in the range of $1–2.5 trillion. This level of investment represents an enormous opportunity for the private sector to provide the infrastructure, equipment, goods, and services that will drive the transition. With this in mind, investors are increasingly considering environmental performance as a proxy for management quality. About two-thirds of the $8 trillion needed for infrastructure investment in Asia and the Pacific between 2010 and 2020 will be in the form of new investments similarly creating tremendous opportunities to design, finance, and manage green growth. At the Rio+20 Conference, the Asian Development Bank (ADB) and seven other multilateral development banks (MDBs) today announced their commitment to provide more than $175 billion of loans and grants for transport in developing countries over the next decade.

Consumer Preferences

The global market for environmental products and services is projected to rise from the current level of about $1,370 billion to an estimated $2,740 billion by 2020 according to German Roland Berger Strategy Consultants. Projections for individual market segments are the following:

- Energy efficiency technologies (appliances, industrial processes, electrical motors, insulation, etc.) to increase from $617 to $1,233 billion by 2020
- Waste management/recycling to increase from $41 to $63 billion by 2020
- Water supply/sanitation/water efficiency to increase from $253 to $658 billion by 2020
- Sustainable transport (more-efficient engines, hybrids, fuel cells, alternative fuels, etc.) to increase from $247 to $493 billion by 2020

Consumers are opting for green products on the basis of health and safety considerations. Preference for organic produce is an example of this. This extends to a number of domains such as energy-efficient appliances and products, using water harvesting structures and renewable sources of energy and ecotourism.

Energy efficiency standards have been introduced in most OECD countries but also in certain developing countries. In 2006, 57 countries with 80% of the world's

population had energy efficiency standards and labeling programs in place. Environmental labeling schemes such as carbon labeling schemes describe the carbon dioxide emissions created as a by-product of manufacturing, transporting, and disposing of a consumer product are also beginning to be used. These trends are likely to tilt consumer behavior toward environment-friendly products and services.

Prospects of Creating Incremental Green Jobs

Greening of economies can also contribute to reinvigorating employment in green sectors. Governments could consider green economies as the means for more and better jobs. A flagship report on green jobs by the United Nations Environment Program (2008) provided comprehensive insights on the impact of a green economy on the world of work. The report argued that, rather than being a drag on growth, the greening of economies can spur additional growth and contribute to additional creation of decent jobs. The report pointed out that green growth would in fact help economies to create jobs that did not exist before and provide opportunities for governments to reinvigorate employment in new and transformed occupations and bring higher value-added work for populations. Such an expansion of green jobs would bring overall economic gains, as well as a host of social and political gains.

Prospects of green jobs have increased not least because of the substantial green stimulus packages that Asian countries put in place in the aftermath of the fiscal crisis with significant "green" elements. A number of countries increased public investments in green infrastructure – particularly in terms of public transport, low-carbon energy production, smart electricity grids, energy efficiency of public buildings, and water and sanitation infrastructure. Employment opportunities were extensive in stimulus packages and measures to move toward a low-carbon economy were seen to help stimulate sustained employment (Anbumozhi and Bauer 2010). The emerging green economy has the potential to employ workers with an even wider range of skills and experiences in a variety of sectors and contribute to a sustainable, low-carbon economy. Industries directly related to carbon reduction, such as renewable energy sectors and waste management, can create new jobs that did not exist before.

To examine conditions needed to create green jobs, the Asia Business Council compiled a green jobs index that compared 13 Asian economies, and the results suggest that the PRC possesses the most favorable conditions for green job creation, followed by Japan and India (Asia Business Council 2009). The Republic of Korea; Singapore; Hong Kong, China; the PRC; the Philippines; Taipei,China; Malaysia; Indonesia; Thailand; and Viet Nam also exhibit potential for green jobs at different levels.

In India, a study finds that low-carbon employment is one of the key co-benefits of promoting the renewables sector (Global Climate Network 2010). It notes that solar power is more labor intensive than wind power and better able to meet India's requirements for small-scale, off-grid power. Biomass, green transport, and public works in water and forest management are also attractive ways of achieving both

employment and environmental objectives. Similarly, increased employment in the renewables sector is estimated for the PRC and Brazil too.

Asian Economies and Green Transition

While Asia has a highly resource-intensive and emission-intensive growth model, green growth projects are rapidly gaining ground. The PRC has become a leader in the development of green technologies. In 2009, the PRC overtook Denmark, Germany, Spain, and the United States to become the world's top manufacturer of wind turbines, and its domestic market for turbines has already become the world's largest (ADB 2012a). A comparison of public investments in key Asian countries and the United States in core clean energy technologies (including solar, wind, and nuclear power; carbon capture and storage; advanced vehicles and batteries; and high-speed rail) reveals that Asia's rising "clean technology tigers" – the PRC, Japan, and the Republic of Korea – have already passed the United States in the production of virtually all clean energy technologies. It is expected that over the next 5 years, the governments of these nations will out-invest the United States three to one in these sectors. Such large public investments will enable these Asian nations to attract significant private sector investments in clean energy technology, estimated to total in the trillions of dollars over the next decade (Breakthrough Institute and the Information Technology and Innovation Foundation 2009).

Large developing countries have emerged as world leaders in clean technology production, exports, and use (UNCSD 2012). Patenting rates for clean energy technologies have increased faster than for other sectors, at about 20% per year since the adoption of the Kyoto Protocol in 1997. The leading six countries patenting clean technologies (Japan, the United States, Germany, the Republic of Korea, the UK and France) account for almost 80% of all patent applications in clean energy technology, but large emerging economies are rapidly emerging as leaders in clean technology patents in their own rights. India features within the top five countries for solar PV, while Brazil and Mexico share the top two positions in hydro/marine (ICTSD 2011).

Implications of Green Growth for Education and Training Systems

Skills Are Crucial to a Green Transition

The emergence of green economies and green jobs is contributing to important adjustments and refinements to skill formation. The demand for skills is being affected in three ways by the transition to green growth (ILO and Cedefop 2011):

(1) growing demand for skills specific to expanding industries such as renewable energy and declining demand for skills in fossil fuel-based industries; (2) new demand for green skills in emerging occupations such as photovoltaic (PV) fitters and carbon-footprint assessors; (3) demand for re-skilling or up-skilling for jobs that are transforming due to transition to renewable sources of energy-efficient technologies and practices. Development of adequate skilled and trained workers and professionals is a key aspect of planning a rapid transition to green economies.

Other studies stress that a successful transition toward a greener economy will create new opportunities for workers but also new risks. The challenge for labor market and skill policies is to maximize the benefits for workers while also supporting broader green growth policies. Four main policy priorities that are identified (OECD 2012) are to do with:

- Supporting a smooth reallocation of workers from declining to growing firms while reducing the adjustment costs borne by displaced workers
- Supporting eco-innovation and the diffusion of green technologies by strengthening initial education and vocational training and ensuring that overly strict product market regulations are not blunting the incentive to innovate
- Reforming tax and benefit systems for workers to make sure that cost pressures generated by environmental policies do not become a barrier to employment
- Designing policies, programs, and strategies for sectoral adjustments as well as local development strategies through partnerships with local stakeholders

According to the OECD, there is evidence that skill shortages may be impeding the transition to green growth in sectors such as energy-efficient construction and retrofitting, renewable energy, energy and resource efficiency, and environmental services. Skill shortages already appear to be impeding the greening of growth. In the PRC and India, rural electrification programs are suffering from a lack of skilled workers. Reasons for these shortages include a scarcity of scientists and engineers, the poor reputation and limited attractiveness of some sectors important for the green transition such as waste management, and a limited number of teachers and trainers in environmental services.

The Rio+20 Conference outcome document (UN 2012) calls for the development of sustainability curricula and training programs for careers in fields related to sustainability. It advocates support to higher education institutions to carry out research and innovation for sustainable development. Entrepreneurship and technical and vocational training to bridge skills gaps to meet sustainable development objectives are also stressed. 250 higher education institutions joined together to issue a declaration at Rio in support of sustainable development, by agreeing to take actions to teach sustainable development concepts across all disciplines, encourage research on sustainable development issues to improve scientific understanding and transfer of technologies and undertake greening of campuses by reducing environmental footprint and promoting sustainable practices.

The UN Decade of Education for Sustainable Development (2005–2015) has contributed significantly to advancing sustainability education in countries, particularly environmental education in school. Education for Sustainable Development

Table 15.1 Integrating biodiversity and climate change education

	Biodiversity education (%)	Climate change education (%)
Percentage of countries reporting implementation of which, included in	59	59
Primary education	95	35
Secondary education	100	50
Higher education	83	80
Teacher education	85	88
Technical and vocational education and training	73	60
Nonformal education	48	56

Source: UNESCO (2012).

(ESD) encompasses environmental, peace, human rights, consumer, development, health, HIV/AIDS, biodiversity, gender, inclusive, multicultural, holistic, global, citizenship, disaster risk reduction (DRR), climate change (CC), and food security. A report on ESD (UNESCO 2012) released at the Rio+20 Conference recorded the efforts made in countries in integrating sustainability education. See Table 15.1.

There Is Need for a New Cadre of Green Professionals

The implementation of climate change commitments is leading to new skill requirements. While some areas require altogether new skills, a large number of existing occupations require additional skills and competencies in the context of efforts to move toward a low-carbon world. New types of skills and competencies will need to be incorporated into existing occupational profiles of the workforce. There is need for developing new training curricula and launching green entrepreneurship promotion campaigns. Vocational and technical training will be critical in building the necessary skill base for green jobs. Link with education and training at higher levels through the tertiary sector is required. Comprehensive green skill standards and certification systems need to be developed. Benchmarking standards, establishing protocols for standards in new green jobs, existing but "transformed" jobs, and in green processes will require participation of higher education institutions. Countries need to establish pathways for training, skill development, and advanced knowledge building between skill development and TVET institutions and higher education institutions.

It is not just about technical skills but a broad spectrum of skills and competencies that are required to support the trend toward green economies, which is not yet addressed in a systematic fashion by technical and tertiary level education systems. International commitments to clean and green growth are requiring a new cadre of green professionals in fields like assessment, reporting, and certification. Currently, they are primarily from developed countries; developing countries in Asia have not yet developed a professional skill base. Knowledge

Table 15.2 Competencies and professional base required for greening economies

Objectives	Enabling	Promoting	Verifying
Expanding low-carbon and green approaches to growth	Environmental and climate change	Skills for implementing environmental services	Knowledge of green accounting and carbon footprinting
Accelerating energy efficiency solutions	Regulations awareness	Skills to commercialize environmental products	Knowledge of greenhouse gas accounting
			Knowledge of certified carbon reduction accounting
Increasing adoption of clean energy solutions and renewable energy	Awareness of behavior changes and consumption patterns to support low carbon growth	Capacities for developing technology options and technology absorption	Knowledge and license for eco-labeling
Increasing energy security and assuring energy for all	Knowledge of choice of appropriate technology	Abilities to implement eco-friendly services such as eco-villages and smart electricity grids	Knowledge and license for ISO 14001 and ISO 50001 certification
Expanding environmentally friendly products and services	Technology absorption and adaptation capacities	Technical and managerial skills to implement low carbon production and processing systems	Knowledge for energy audits
	Product development capacities	Skills to implement business models that meet the triple bottom line – financial, social, and environmental	Knowledge for certifying legal compliance with regulations
	Environment services and advisory services capacities		Knowledge of protocols for MRV requirements

MRV=measurement, reporting, and verification.
Source: Compiled by author.

sharing and exposure to how Western countries developed these green certification professional cadres are insufficient. There is need for finance professionals who can tackle issues relating to carbon finance and return on investment (ROI) analysts who can build a business case for green technologies, in addition to engineers and technicians with knowledge of renewable and energy-efficient systems and services. Table 15.2 provides an illustrative sample of skills and knowledge that are needed to enable, support, and verify greening initiatives.

Training, Retraining, and Knowledge Advancement for Greening Economies

Labor markets will be affected in a number of ways as climate change regulations are enforced and green growth proceeds further. Some jobs will be substituted in the process of shifting from say fossil fuels to renewables or from land filling and waste incineration to recycling; some jobs will be altogether lost without direct replacement when production of certain products is banned by regulation; additional jobs will be created, e.g., in the manufacture of new products or offering of new services in a pro-environment economy; and a number of existing jobs will be transformed with new competencies, such as those of plumbers, electricians, and metal and construction workers as corporations adopt greening measures or retrofit or build new buildings with energy-efficient equipment.

Thus, a greening economy would require new training and retraining of the workforce to adopt new production processes. As fossil fuel-based industries move toward greening, a number of workers may lose their jobs or could be at risk of losing jobs unless their skills are updated and they are retrained.

Education and Skill Strategy Needs to be Integral to Overall Green Economy Initiatives

The overarching policy challenge is how best to coordinate employment and skills development policies with environmental and sector policies for more sustainable development and low-carbon economies. Skills development is a precondition for reaping the economic, carbon reducing, and job opportunity benefits of low-carbon investments. The greening of jobs in industries with high technology and innovation content would rely on specialist knowledge, especially in the fields of science, technology, engineering, and mathematics (STEM). Close cooperation between education institutions, governments, and the business community will be essential to ensure that education equips individuals with the skills necessary to be competitive in a greening job market (International Organization of Employers 2010).

A study by the European Centre for the Development of Vocational Training (Cedefop 2010) revealed none of the EU Member States, with the exception of France, had put in place integral skills response strategies as part of their environmental and green growth strategies. Many of the green industries in Asia are currently fragmented. University offerings lack cross-disciplinary breadth and faculty needed to train future workers in the technical, economic, social, and managerial challenges associated with green industry development.

Green economies and green jobs are also spurred by innovation. In addition to technical training, there is a need to facilitate entrepreneurship training, business incubation services, and access to finance. This can help low-income countries to

leapfrog on the technology spectrum and turn innovation for a green economy into successful business models.

In addition to skills training, addressing a wider range of institutional regulatory and quality assurance issues will help Asia to benchmark its progress against well-articulated standards. For example, the Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a third-party certification program and the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings. LEED provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance. An Asia Pacific Certification is on the cards for green buildings. Further work in this domain will establish Asia's leadership in green growth.

Green jobs have great potential; however, they need not automatically be quality jobs, constituting "decent" work, i.e., with adequate wages, safe working conditions, job security, career prospects, and worker rights. There are dangers of "green washing" where only nominal support to environmental goals actually provides very poor-quality employment. An example could be poor-quality electronics recycling which may give rise to employment in hazardous conditions. The use of unskilled labor in biofuel and biomass production may give rise to numerous jobs but at subsistence wages and poor working conditions. In this case, green jobs do not constitute quality employment. Thus, it is important to ensure that green jobs are also "decent" jobs in pursuit of inclusive growth. For example, providing energy access to rural India and a distributed model of generating jobs that is not urban centric will support inclusive growth.

There is need to consider active strategies in skills for green employment that take into account inclusive models. For example, renewable energy models are fairly small scale and distributed – small-scale solar and wind projects which can give rise to the need for an extensive technical support service network, which can be addressed by skills training systems. There could well be a case here for multiple skilling techniques as it may become unfeasible to send a number of different experts to various rural locations.

Mapping Occupational Profiles for Green Economies Across Different Levels of Education

Education and training for greening economies and corporations need to address all levels of education. At the basic education level, environmental education has an important role to play in creating awareness. The Johannesburg Sustainable Development Summit resulted in the announcement of a new decade – Education for Sustainable Development Decade from 2005 to 2015 – and this led to the incorporation of curricula on environment and sustainable development at the school level. Recent advances on climate change mitigation and adaptation efforts and the

discourse on the agenda for green growth have given rise to a range of skill needs at technical and vocational education and at tertiary education levels.

In order to respond comprehensively to the needs of economies making the transition to green economies, education and training systems need to take an integrated view of potential opportunities and constraints for green initiatives. An integrated approach takes into account how the spectrum of competencies can be addressed at different levels of education. For effective greening initiatives, not only the main manufacturing company but the supply chain companies also need to adopt "greening" measures. Technology, materials management, processes, and products all embody "green" elements. In addition to engineers, scientists, and technicians, finance and accounting professionals also have a role to play. Table 15.3 provides an illustrative example of how different levels of education and training contribute to the competencies, knowledge, and skills needed in a green economy.

Conclusions

Issues relating to education and training for greening economies should be viewed in the overall context of skills for inclusive employment. Discussions on green skills are juxtaposed on the broader skills discourse. Green growth is a proxy for an ever-changing world; the pace of transformation is much faster now than ever before. There is need for education and skills training systems to be flexible and adaptive.

Skills development, training, and education for greening economies are constrained by the general problems confronting education and training institutions. The general failings of the education system also create problems for the greening sector; particularly, the slow responsiveness of education institutions to new trends and demands exacerbates skills shortages. Poorly performing universities and lack of good-quality research and the overall problem of skills mismatch that is an overriding problem in recent years also apply to green skills and green professionals. The lack of employer incentives and lack of access to finance for training are generic problems. However, integrating skills strategies for green occupations and ensuring that education and training for fast-changing green sectors would also benefit the overall rate of responsiveness of training institutions to emerging new demands for skills. In this scenario, the agility of training institutions to greening sectors could be replicated as a systemic feature. Developing countries need to increase their enrollment in technical tertiary education and improve the quality and relevance of such education. Such an increase would accelerate growth and help with skill limitations created by green policies.

Leading educational institutions of the world are already on this track. Stanford University now has 500 courses that include a component of sustainability embedded across the curriculum for various disciplines – medicine, mathematics, economics, engineering, law, and life sciences. The University's Sustainability 3.0

Table 15.3 Education and training for greening in one industry: green construction

Objectives	Basic education	Skills, technical education, training	Tertiary/professional education
Reducing CO_2 emissions Improving energy efficiency	Investments to strengthen STEM teaching	Technicians (fitting, retrofitting), plumbers, masons, painters, electricians	Planners, architects, interior designers Engineers certified for green building skills
Expanding use of clean energy technologies	Incorporating Education for Sustainable Development in school curriculum	HVAC installers for using energy efficiency tools and techniques	Marketing managers appraisers, valuers, property managers certified for green
Ensuring safety	Quality improvements in secondary school curriculum	Contractors and materials managers for using appropriate materials and processes for insulation, roof, walls, lighting, appliances, water heating, water harvesting	Energy auditors, building inspectors
Implementing environmental protection, water conservation	Improving teacher training for developing young scientists and turning student into enquirers and explorers		Finance and accounting professionals Insurance and credit valuation
Promoting recycling	Strengthening the measurement and monitoring of learning outcomes	Safety engineers (disaster proofing)	Certification – of processes, professionals, and products (certified architects, finance professionals, marketing managers, appraisers, valuers)
	Using schools as "green" buildings and implementing practical greening initiatives	Supply chain managers and inventory managers	
	Green schools	Installation and maintenance of equipment and materials	LEED certification
		Green TVET institutions	Trainers and instructors for green or greening occupations

HVAC=Heating, Ventilating, and Air Conditioning; LEED=Leadership in Energy and Environmental Design; STEM=Science, Technology, Engineering, and Math.
Source: Compiled by author.

Strategy aims to reduce the environmental impact of students and campus buildings. Columbia University has a Master of Science in Sustainability Management and an extensive array of sustainability management courses. Columbia and IBM have partnered to launch a green-tech skills initiative to provide next-generation entrepreneurs access to skills needed to accelerate sustainability projects and to be competitive when they enter the workforce. Hong Kong University proposes to start a Master of Arts in Education for Sustainability. TERI University of India as a specialized

institution focuses on courses in climate science and policy, natural resource management, environment studies, renewable energy engineering and management, sustainable development practices, etc. The Petroleum University of Gujarat has established a school of solar energy. Much more work is at hand to increase the global availability of qualified and skilled professionals.

There is need for education and training systems to consider the breadth and depth of skills, education, and training needed across the entire spectrum of greening economies and corporations. The advancement of green growth theories would require capacities and knowledge for valuation of ecosystem and measurement of natural capital in macroeconomic terms and incorporating them into systems of national accounts. A whole new world of finance has opened up as a requirement to advance the green agenda – from carbon finance, financial modeling for sustainable cities, buildings, and townships to sustainability finance managers. Highly technical and scientific skills are needed in the context of reducing emission, enabling cleaner and lower-carbon cities, transport systems, and habitats. But the most important aspect is to ensure that education and training systems themselves become more innovative and forward looking, so that while they respond to the emerging needs of green professionals, they also play a more influential and far-reaching role in anticipating and preparing for sustainable and resilient societies.

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Chapter 16
Redesigning of Curriculum and Training for Skills for Green Jobs in the Republic of Korea

Namchul Lee

Introduction

Green growth and conditions for a green economy are high on the agenda of the G20 and the United Nations conference on sustainable development in 2012. The Republic of Korea is the world's seventh largest emitter of carbon dioxide and is also more prone to climate change. The Republic of Korea is quite rightly praised for seeing and seizing the opportunity of a transition toward a green economy and delivering green growth early on and is already reaping a harvest in terms of a pathway toward sustainable development.

The Government of the Republic of Korea pronounced its National Strategy and 5-Year Plan for "Low-Carbon Green Growth" in 2008. The Republic of Korea aims to become one of the top seven green growth nations by 2020 and one of the top five by 2050. Based on the nation's vision for the Republic of Korea's green growth, the Korean government has focused on upgrading the skills of existing manpower in green industries and encouraged this new manpower development to lead green industries. Under this government policy, industries, universities, research institutes, and the government have been reorganizing green job skill development programs and training courses with the aim of creating suitably skilled manpower in the green job sector.

This chapter is the case study commissioned by Korea Eximbank and analyzed the approaches taken by the Republic of Korea's TVET institutions to gear skills training curriculum and courses toward the needs of green jobs.[1] The Republic of

[1] This chapter revised and complemented the contents of Lee and others (2012), Education and Skills for Inclusive Growth and Green Jobs: The Republic of Korea's Experiences on Education and Skills for Green Jobs. This project was carried out and commissioned by the Export–Import Bank of Korea in 2011.

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Korea's Green Growth Deal outlines extensive commitments toward shifting the economy toward green growth. The Republic of Korea was the country that allocated the largest proportion of its fiscal stimulus package (in the aftermath of the fiscal crisis) toward green public initiatives. This chapter analyzes the steps taken in the country to prepare training programs and developing skills aligned to such an overarching green economy vision and the lessons they offer to developing countries.

The chapter proceeds as follows: The next section explains Green Growth National Strategy and Green New Deal Strategy in the Republic of Korea. The third section discusses job skill development and green jobs. The fourth section explores change of vocational education and training under the green growth policy. The fifth section analyzes cases of redesigning curriculum and training in TVET institution, and the final section presents conclusions.

Green Growth National Strategy and Green New Deal Strategy

Green Growth National Strategy

Background of Promoting Green Growth

The Republic of Korea set low-carbon green growth as a new paradigm of national development in 2008, and based on this, the Republic of Korea started to push forward with green growth in earnest by launching the Presidential Committee on Green Growth under the direct guidance of the President in 2009. This section discusses the processes through which the Republic of Korea has been seeking green growth by analyzing the background of the presentation of low-carbon green growth as a new paradigm of national development and presenting governmental policies for green growth.

The Republic of Korea depends on imports for 97% of its energy and its energy consumption has been gradually increasing. In addition, as the Republic of Korea has an industry structure with a high proportion of manufacturing, a heavy energy-consuming industry, it has faced a situation where new and renewable energy and green energy have become necessary rather than an option. So far, the Republic of Korea has achieved tremendous growth through fostering major industries such as heavy chemical and electronics. However, as it has entered a low-growth phase, it has been necessary to set green growth as its new growth engine. The Republic of Korea's GDP has stalled between 11th and 13th for the past 15 years since it was recorded as the world's 12th biggest in 1993.

Republic of Korea's Vision and Strategies of Green Growth

The Republic of Korea has implemented three detailed strategies and 10 policy directions to be among the top seven green growth power nations by 2020 and among the top five by 2050. Three strategies are adapted to the climate change and

energy independence, creating new growth engines, improving quality of life, and enhancing the nation's status. Ten policy directions based on this are the efficient greenhouse gas reduction, the enhancement of de-petroleum and energy self-reliance, the enhancement of climate adaptation capability, the development of green technology and a future growth engine through the development of green technology, making an industry green and fostering the green industry, the sophistication of the industry structure, the establishment of bases for green economy, the formation of green land transportation, the green revolution of lives, and the realization of the world's renowned green growth model nation. To establish and execute the national strategies that include the policy goals, propulsion strategies, and major tasks for low-carbon green growth of the nation, the Republic of Korea enacted the Low-Carbon Green Growth Basic Act in 2009 and has pushed forward with various policies based on this Act.

The Republic of Korea established the Presidential Committee on Green Growth (PCGG) in February 2009 under the direct supervision of the President to facilitate the realization of the new national vision of "low-carbon green growth." The Committee consists of 47 members, including relevant government ministers and representatives from key national research institutes, and has the mandate to discuss all subjects related to green growth, including the planning and implementation of policies on green growth as well as the coordination of government activities in this area.

Through the Committee, the Republic of Korea announced 27 national strategies for Green IT in May 2009, finalized the Five-Year Action Plan for Green Growth in July 2009, confirmed the voluntary reduction of its GHG emissions to 30% below business-as-usual (BAU) levels by 2020 in November 2009, and announced the enforcement of the "Framework Act on Low Carbon, Green Growth" in April 2010.

The establishment of the PCGG is one of the most distinctive features of the Republic of Korea's green growth strategy. The launching of the Committee is proof of the government's dedication to promoting this new development paradigm, and the body's effective leadership thus far has been the most critical element in developing effective green growth strategies and policies. Thus, the prioritization of green growth as its top national agenda has allowed the Republic of Korea to become one of the early green leaders. Furthermore, the Republic of Korea believes that green growth can be turned from vision into reality with the help of relevant ministries, advisory groups, and private sector actors.

In particular, the PCGG's focus on strengthening internal networks between central and local governments and heeding public opinion has created an open structure under which effective green growth policies have been developed. On July 6, 2009, the Republic of Korea announced the objective of becoming the world's seventh largest green economic power by 2020 and the fifth largest by 2050. To achieve these goals, the Republic of Korea has formulated three strategies for green growth: (1) mitigating climate change and promoting energy independence, (2) creating new engines for economic growth, and (3) improving the quality of life and enhancing the Republic of Korea's international standing. These strategies are designed for facilitating the implementation of various sub-policies established under the "low-carbon green growth" vision, and the 10 key policy directions deemed necessary to achieve the vision (see Table 16.1).

Table 16.1 Vision and strategies of the Republic of Korea's green growth

National strategies	Policy directions
1. Mitigating climate change and promoting energy independence	1. Effective mitigation of greenhouse gas emission
	2. Reduction of the use of fossil fuels and the enhancement of energy independence
	3. Strengthening the capacity to adapt to climate change
2. Creating new engines of economic growth	4. Development of green technologies
	5. The "greening" of existing industries and the promotion of green industries
	6. Advancement of the industrial structure
	7. Engineering a structure basis for a green economy
3. Improving the quality of life and enhancing the Republic of Korea's international standing	8. Greening the land and water and building a green transportation infrastructure
	9. Bringing a green revolution to daily life
	10. Becoming a role model for the international community as a green leader

Source: Presidential Committee on Green Growth (2010)

The policies set out under the first Five-Year Action Plan (2009–2013) for green growth have been well received by the country's society, resulting in a substantial increase in public and private investment (PCGG 2010).[2]

This proactive plan and investment strategies demonstrate the strong will of the Government of the Republic of Korea in promoting green growth policies and are symbolic of its efforts to secure required financial resources. According to the PCGG (2010), the budget mentioned above is to be spent specifically on various activities associated with the research and development of green technologies, including those related to solar energy and fuel cells, the restoration of the four major rivers, and the development of green transportation.

The government enacted and promulgated the "Framework Act on Low Carbon, Green Growth" on January 13, 2010, which went into effect on April 14, 2010. The main purpose of the Framework Act is to implement legal measures that can effectively address climate change and energy issues and to promote sustainable development. Meanwhile, the Act also mandates the establishment of institutional and implementation systems, for instance, the Presidential Committee on Green Growth, for low-carbon green growth strategies so that the policies could be carried out in an efficient and systematic.

A technological transformation that reduces the carbon intensity of industry, in particular in the Republic of Korea's manufacturing sector, is therefore a core component of a green growth strategy. The Republic of Korea's Green Growth

[2] Under the Five-Year Action Plan, KRW 107 trillion (approximately $83.6 billion USD), which represents 2% of the Republic of Korea's GDP, is to be allocated for managing issues related to climate change and energy, sustainable transportation, and the development of green technologies between 2009 and 2013.

Table 16.2 List of 27 core technologies in the Republic of Korea's Green Growth National Plan

Sector	27 Core technologies	Notes
Climate change	1. Monitoring and modeling for climate change	(4)
	2. Climate change assessment and adaptation	(4)
Energy source technology	3. Silicon-based solar cells	(1)
	4. Non-silicon-based solar cells	(4)
	5. Bioenergy	(4)
	6. Light water reactor	(1)
	7. Next-generation fast reactor	(3)
	8. Nuclear fusion energy	(3)
	9. Hydrogen energy R&D	(3)
	10. High-efficiency fuel cell	(3)
Efficiency improvement technologies	11. Plant-growth-promoting technology	(3)
	12. Integrated gasification combined cycle	(3)
	13. Green car	(2)
	14. Intelligent infrastructure for transportation and logistics	(4)
	15. Green city and urban renaissance	(3)
	16. Green building	(3)
	17. Green process technology	(2)
	18. High-efficiency light-emitting diodes/green IT	(1)
	19. IT-combined electric machines	(3)
	20. Secondary batteries	(2)
End-of-pipe technology	21. CO_2 capture, storage, and processing	(3)
	22. Non-CO_2 processing	(2)
	23. Assessment of water quality and management	(2)
	24. Alternative water resources	(2)
	25. Waste recycling	(2)
	26. R&D in monitoring and processing for hazardous substances	(3)
R&D in virtual reality	27. Virtual reality	(2)

Source: UNEP (2008)
Notes:
(1) Technologies for short-term intensive investment;
(2) Technologies for midterm intensive investment;
(3) Technologies for long-term intensive investment;
(4) Technologies for long-term gradual investment; and KRW (Korean won; US 1 dollar – 1,136 won, on 24 January 2012)

Plan seeks to promote the development of 27 core green technologies that would provide future engines of growth to the economy (See Table 16.2).

Table 16.3 shows that the fiscal expenditure on green growth from 2009 to 2013. Annual average rate of mitigating climate change and promoting energy independence is the highest among three categories.

Table 16.4 shows the development stage plan through the Republic of Korea's green growth in 2010, in 2013, in 2020, and in 2030. Confirming green growth infrastructure plan (2010) included preparing growth infrastructure through promoting green growth national project. Green technology and industrial power country plan (2013) include creating green jobs, and seven leading green growth

Table 16.3 Fiscal expenditure on green growth (2009–2013) (Unit: trillion KRW, percent)

Category	Total	2009	2010–2011	2012–2013	Annual average rate
Total	107.4	17.5	47.3	41.6	10.2
Mitigating climate change and promoting energy independence	56.9	8.6	29.2	19.2	14.0
Creating new engines of economic growth	28.6	4.8	10.7	13.1	9.4
Improving the quality of life and enhancing the Republic of Korea's international standing	27.9	5.2	10.5	12.2	3.6

Source: Presidential Committee on Green Growth (2010)

Table 16.4 Development stage plan through the Republic of Korea's green growth

Year	Development plan	Contents
2010	Confirming green growth infrastructure	Preparing growth infrastructure through promoting green growth national project
2013	Green technology and industrial power country	Green technology, increase industrial export
		Green job creation
		Securing new growth engine through green growth
2020	Seven leading green growth country	Achieving world seven leading green growth country
		Supporting green growth to East Asia's underdeveloped country
		Enhancing green growth national image
2030	World's top five green growth country	Achieving green developed country in the field of economic, social, and so on

Source: Presidential Committee on Green Growth (2010)

country plan (2020) has a goal achieving world's seven leading green growth county, and world's top five green growth plan (2030) includes achieving green developed country in the field of economic, social, and so on.

Green New Deal Strategy

Purpose and Scope

The Green New Deal Project has been formulated by developing it into policies that can bring concrete performances such as job creation as well as potential growth engines by promoting Green and New Deal at the same time. Green New Deal aims to maximize the policy effects by systematically integrating duplicated green projects with unclear goals by converging green growth strategies such as low-carbon, eco-friendliness, and resource saving with job creation policies and also aims to lead the green economy realization and the preservation of the Earth's environment. To this end, the roles are efficiently divided so that such policies are actually operated and executed.

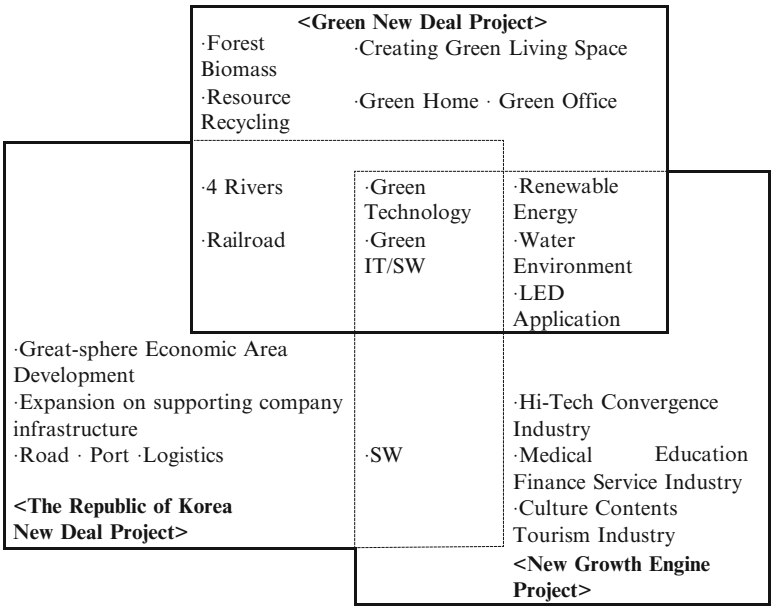

Fig. 16.1 Scope of Green New Deal Projects (Source: State Council of Ministry of Strategy and Finance, Ministry of Education, Science and Technology, Ministry of Culture, Sports and Tourism, Ministry of Food, Agriculture, Forestry and Fisheries, Ministry of Knowledge Economy, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs, Prime Minister's Office, National Emergency Management Agency, Korea Forest Service 2009)

The Green Growth Committee and Planning Group set policy directions and strategies and evaluate them, and the Ministry of Planning and Finance adjusts finances and operates the support system that adjusts duplicate projects among departments and sets priorities among related projects. In addition, each department takes charge of exploring Green New Deal projects and executing the selected projects. The inclusive scope of Green New Deal has selected the following as its major projects to promote the transition to a green economy and create growth and jobs at the same time (refer to Fig. 16.1).

Promotion Strategies

Figure 16.2 explains that promotion goals and strategies of Green New Deal Project in the Republic of Korea.

Expansion of Resources Reuse

The Green New Deal Project has the following nine core goals:

1. Reviving the four major rivers and the rearrangement of their surroundings

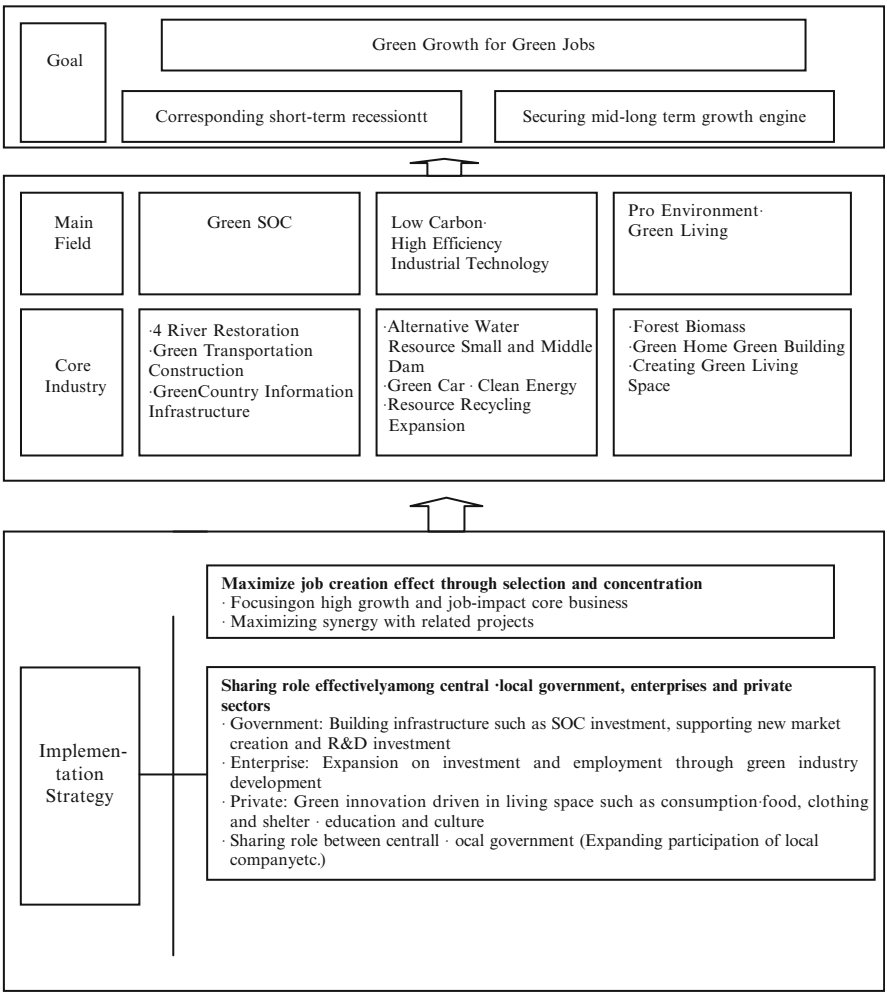

Fig. 16.2 Promotion goals and strategies of Green New Deal Project (Source: State Council of Ministry of Strategy and Finance, Ministry of Education, Science and Technology, Ministry of Culture, Sports and Tourism, Ministry of Food, Agriculture, Forestry and Fisheries, Ministry of Knowledge Economy, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs, Prime Minister's Office, National Emergency Management Agency, Korea Forest Service 2009)

2. Green transportation network establishment
3. Establishment of green national information infrastructure
4. Securing alternative water resources and building eco-friendly small- and medium-sized dams
5. Distribution of green cars and clean energy
6. Expansion of resources reuse

7. Activation of forest biomass use
8. Expansion of energy-saving green homes, offices, and schools
9. Forming pleasant green life space

Table 16.5 represents finance requirements and size of job creation from the core projects. Finance includes national treasury and local private burden. Through the propulsion of a total of 36 projects (9 core projects and 27 related projects), a total of KRW 50 trillion is invested for years 2009–2012, creating a total of 960,000 jobs. In the case of the 9 core projects, a total of KRW 39 trillion is invested, creating 690,000 jobs, while the 27 related projects will create 270,000 jobs with the investment totaling to KRW 11 trillion during the same period. For years 2009–2012, the number of jobs which would be created for youth (aged 15–29) has been estimated to a total of 100,000 centered on reviving the four major rivers and the forest biomass project.

Job Skill Development and Green Jobs

Green skills mean the ability required to execute green jobs and to produce new green products necessary for jobs relating to manufacturing, services, and marketing. In the context of green growth, because the intended policy aspects are also emphasizing that traditional jobs can be incorporated into the green industry, green skills also include abilities for finding out and understanding and learning and innovating low-carbon technologies in addition to technical ability.

A green job means that it is related to agricultural, manufacturing, research and development, administration organizations, and service activities that contribute to protect or restore the quality of the environment. In particular, it refers to jobs related to economic behavior for reducing energy, material, and water consumption and reducing carbon emission through very efficient strategies. Green jobs can be classified by required technologies or skills. Therefore, with the advent of the green economy, the job market is affected by the following three aspects. First, the green economy increases the jobs in relation to it by increasing the employment demand for the existing jobs related to the green economy. Second, the green economy changes tasks, skills, and knowledge required for existing jobs. Third, the green economy creates new jobs.

Such changes have created jobs in three ways. First of all, it is the creation of an increase in demand for green occupations. This means that the impact of green economy activities and technologies increases the demand of existing occupations. However, such impacts do not accompany meaningful change for the requirements of the work and workers of the occupation. That is, although the work context may change, tasks themselves do not.

Second, it creates green enhanced skill occupations. In this job type, the impact of green economy activities and technologies causes meaningful changes to the work of existing jobs and the requirements of the workers. This impact may or may

Table 16.5 Finance requirements and size of job creation form core projects

Project		Finance (100 million won)			Job creation (person)		
		Before (2009)	Additional amount (~2012)	Total	Before (2009)	Additional amount (~2012)	Total
Total		43,626	456,866	500,492	93,360	863,060	956,420
Core Business (9)	4 River restoration	4,881	139,895	144,776	7,000	192,960	199,960
	Green transportation expansion	18,349	78,187	96,536	25,042	113,025	138,067
	Building national space information integration system	250	3,467	3,717	816	2,304	3,120
	Rainwater outflow facilities, small- and medium-sized dam	1,845	7,577	9,422	3,063	13,069	16,132
	Green car and clean energy distribution	3,209	17,318	20,527	1,643	12,705	14,348
	Waste recycling	506	8,794	9,300	2,377	13,819	16,196
	Green forest gardening	3,131	21,043	24,174	22,498	148,204	170,702
	Green home, green school project	–	80,500	80,500	–	133,630	133,630
	Eco-river composition	52	4,786	4,838	393	10,396	10,789
Business link (27)	Maintenance business on disaster risk district	5,137	19,901	25,038	8,529	33,038	41,567
	Clean Korea practice business	437	1,666	2,103	3,236	11,310	14,546
	Greening riparian areas	331	7,669	8,000	827	19,073	19,900
	Building transfer facilities	1,782	3,396	5,178	2,959	5,639	8,598
	Building main express bus system	200	1,544	1,744	253	1,955	2,208
	National bicycle route network	–	4,980	4,980	–	8,268	8,268
	Road bike express pilot project	–	3,000	3,000	–	4,980	4,980
	Building energy integrated management system	–	340	340	–	760	760

(continued)

Table 16.5 (continued)

Project	Finance (100 million won)			Job creation (person)		
	Before (2009)	Additional amount (~2012)	Total	Before (2009)	Additional amount (~2012)	Total
Promoting the usage of electronic documents	–	800	800	–	8,430	8,430
Road-based underground facilities computerization	400	2,199	2,599	–	7,767	7,767
Entering overseas water industry	199	1,790	1,989	171	1,281	1,452
Seawater desalination technology development	246	878	1,124	1,700	5,700	7,400
Wastewater reuse	403	3,364	3,767	431	5,570	6,001
Securing originality in car technology	414	1,522	1,936	42	154	196
Bioethanol vehicle dissemination	–	30	30	–	60	60
Bioethanol (E5) demonstration distribution	–	272	272	–	575	575
Biomass energy recovery	362	10,858	11,220	2,853	21,519	24,372
Building biomass production infrastructure	546	2,262	2,808	582	4,3432	4,924
Closed landfill site redevelopment	–	5,300	5,300	–	9,230	9,230
Disaster prevention, damaged forest restoration (forest biomass utilization)	786	6,541	7,327	8,430	44,218	52,648
Forest biomass utilization	65	816	881	420	2,710	3,130
Building rural theme park	95	755	850	95	755	850
LED lighting replacement project in public facilities	–	13,356	13,356	–	10,030	10,030

(continued)

Table 16.5 (continued)

Project	Finance (100 million won)			Job creation (person)		
	Before (2009)	Additional amount (~2012)	Total	Before (2009)	Additional amount (~2012)	Total
Building green IT technology test bed	–	100	100	–	10,000	10,000
Training green home doctor	–	160	160	–	1,332	1,332
The roof of the building, wall afforestation business	–	1,130	1,130	–	2,800	2,800
Building eco-road	–	310	310	–	920	920
Reconstructing the small-scale idle facilities into culture facilities	–	360	360		532	532

Source: Report of the State Council of Ministry of Strategy and Finance, Ministry of Education, Science and Technology, Ministry of Culture, Sports and Tourism, Ministry of Food, Agriculture, Forestry and Fisheries, Ministry of Knowledge Economy, Ministry of Environment, Ministry of Land, Transport and Maritime Affairs, Prime Minister's Office, National Emergency Management Agency, Korea Forest Service (2009)

not increase the employment demand for jobs. While the essential purpose of the job is the same, external factors such as its work, skills, knowledge, and qualifications change.

According to a joint study by UNEP, ILP, IOE and ITUC, a green job is defined as "the job that contributes to preserving and recovering the quality of environment by performing its role of reducing the environment force in companies and various economic areas ultimately to the sustainable level of society." Such green jobs can be found in all industry areas including agriculture, manufacturing, and service (see Table 16.6).

Recently, there have been many debates about whether which green jobs are decent jobs. Optimists suggest that "green jobs are providing fair wages, good extra salaries, promotion opportunities, and working conditions beneficial to health." Pessimists suggest that many green jobs are unstable, expose workers to physical risks, and pay less than the recommended minimum wage. This debate is leading the policy direction of green job creation. That is, creating decent, environmentally friendly jobs is the policy objective.

Over the next 5 years, the growth rate of green jobs (6.0%) is expected to be much higher than the average growth rate of the total jobs (1.3%) in the Republic of Korea (green growth committee, 4 November 2009). New jobs will be created by, in particular, renewable energy and environmental improvement programs. In 2006, the total number of employees in environmental industries was 390,406, of which 178,174 employees (45.6%) were directly related to environmental fields.

Table 16.6 Green jobs by sector

Sector	Types of green jobs
Energy supply	Coal gasification, cogeneration, renewable energy, fuel cells
Transportation	Fuel-efficient vehicles, hybrid electric and fuel cell vehicle, non-power transportation (bicycle, walking), change in land use and residence pattern (less dependence on vehicle)
Manufacturing	Pollution control, energy and material efficiency, clean manufacturing
Construction	Fuel-efficient bulb, electric and office equipment, solar energy system, environmentally friendly building, solar house, zero-emission house
Recycling	Recycling, extended producer responsibility, durable and recyclable products
Agriculture	Soil conservation, efficient water use, organic farming, better access to market from farm
Forestry	Reforestation, subordinate forestry, sustainable forest management and accreditation, logging ban

Source: UNEP (2008)

By 2012, about 8,000 social jobs in environment will be created, and 35,000 jobs will be created in wind and solar energy.

While the employment induction coefficient per billion KWN of environment industry is 10.3 and 18.8 in wind energy, the employment induction coefficient of solar energy (102.0) and social jobs (119.0) is much higher than other fields. Solar energy has the potential to create a larger number of new jobs than conventional industries, offering a solution to the problem of "jobless growth." By 2012, 100,000 new jobs in renewable energy, another 100,000 in energy efficiency, and 17,000 in waste-to-resources sectors will be created. The renewable energy industry alone is expected to have generated 950,000 new jobs by 2030.

Between 2009 and 2013, the number of green jobs will continually increase by 9.0% (annual average increase rate, 33,628 jobs). The total number of green jobs in 2013 is estimated to be 482,090 jobs. Green jobs in agriculture, fishing, and mining industries will increase by 3.4%, while green jobs in manufacturing and services will increase by 4.5% and 12.1% respectively (Table 16.7).

The following Table 16.8 shows the number of green jobs by skill level. Between 2009 and 2013, the number of green jobs will continually increase by 6.1% (annual average increase rate), by 11.0%, and by 9.3%, in basic level, middle level, and advanced level, respectively. The total number of green jobs in 2013 is estimated to be 482,091 jobs.

Change of Vocational Education and Training Under the Green Growth Policy

To understand the institutional framework of the Republic of Korea's vocational education and training, it is necessary to understand how vocational education and training is operated in the Republic of Korea. Vocational education in the Republic

Table 16.7 Green jobs prospects by industry (Unit: person, percent)

						2009–2013		
		2007	2008	2009	2013	Increase/decrease	Annual average increase/decrease	Annual average increase rate
Green jobs	Agriculture, fishing, mining	10,578	12,690	9,865	10,415	−2,275	−455	−3.4
	Manufacturing	114,157	117,293	121,150	145,835	28,542	5,708	4.5
	Services	169,756	183,965	206,961	325,840	141,875	28,375	12.1
	Total	294,492	313,948	337,976	482,090	168,142	33,628	9.0

Source: Interministerial Committee, Unpublished report (2009)

Table 16.8 Green jobs prospects by skill level (Unit: person, percent)

						2009–2013		
		2007	2008	2009	2013	Increase/decrease	Annual average increase/decrease	Annual average increase rate
Green jobs	Basic	53,992	56,265	57,570	75,662	19,398	3,880	6.1
	Middle	35,569	38,037	43,242	64,037	26,000	5,200	11.0
	Advanced	204,931	219,647	237,163	342,392	122,745	24,549	9.3
	Total	294,492	313,949	337,975	482,091	168,143	33,629	9.0

Source: Inter-ministerial Committee, Unpublished Report (2009)
Notes:
Basic level: ISCED 3A, high school graduates, craftsmen
Middle level: ISCED 5B, 2- or 3-year college graduates, technicians, industrial engineers
Advanced level: ISCED 5A, 4-year university graduates, managers, researchers, engineers, professional engineers
ISCED International Standard Classification of Education

of Korea generally refers to the education provided at the stage of middle or high school education to foster personnel under para-technician or paraprofessional. However, practically, it refers to the formal education received in specialized high schools at the stage of middle education and in specialized colleges at the stage of higher education within the direction (regulations) of the Ministry of Education, Science, and Technology.

The education organizations with the purpose of providing vocational education include specialized high schools under "the Act of Elementary and Secondary Education," technology high schools (exceptional organizations), specialized colleges and technology colleges under "the Act of Higher Education," in-house universities under "the Continuing Education Act," and continuing vocational education institutes under "the Act of the Establishment, Operation of Private Institutions, and Private Tutoring." Technical colleges and in-house universities

have unique characteristics in that the subject of establishment and operation is the company itself.

Vocational training in the Republic of Korea includes improvement training and reemployment training for those who are already in the labor market or who are unemployed, as well as initial training provided to help them enter the labor market for the first time. However, reeducation of professionals is not included in the category of vocational training. As such, the importance put on improvement training and reemployment training means that vocational training policies are closely linked with labor market policies. Practically, vocational training can be regarded as learning in which employment insurance is reimbursed from vocational training organizations within the scope of direction (regulations) of the Ministry of Labor, or learning that is supported by the budget of the government.

Vocational training organizations are public occupational training organizations operated by the government. They include occupational ability development and training facilities, occupational ability development training companies, occupational ability development groups as well as Korea Polytechnics. They also include schools under the "Higher Education Act," continuing education centers under the "Continuing Education Act," private institutes under the "Act on the Establishment, Operation of Private Institutes, and Private Tutoring," and training facilities made by owners or owner groups of a company for employees, etc. According to the Act on Industrial Education Promotion and Industry-Academic Cooperation Promotion, education to teach necessary knowledge, technologies, and attitude needed for all kinds of industries can be regarded as vocational education and all of those organizations that provide such vocational education can be regarded as vocational education organizations. Therefore, general high schools and 4-year universities can also be considered organizations that provide occupational education.

Cases of Redesigning Curriculum and Training in TVET of the Republic of Korea

In the labor market, there will be a discrepancy between manpower with traditional proficiency and green experienced manpower newly required by the industry society. Such ripple effects on the labor market show the positive and negative effects of green job growth. Existing jobs will disappear as many new jobs are created because non-regular workers increase as regular workers increase. Although it is believed that green jobs are related to future technology, all jobs are also noteworthy. The net size of newly created jobs within technological development and new industries is not as big as expected. It indicates that it is more important to facilitate green growth through education and training for technology and skill transfer of existing manpower by changing jobs in existing industries to fit the green environment.

In this respect, the Government of the Republic of Korea has tried to transform the technology and skill of existing manpower to fit the green industries in tandem with green growth and developed new personnel that will lead the green industry. This section focuses on the discussion of the strategies and changes in vocational education and training for developing green talents who would support the green growth of the Republic of Korea. However, as the industrialization of the Republic of Korea's economy was developed under the backdrop of nation-led economic development policies and national human resources development policies, the characteristics of the Republic of Korea's vocational education and training are first introduced to provide basic understanding on such attributes. This is because it would be hard to understand the Republic of Korea's vocational training program newly established in accordance with the nation's green growth policies, if the human resources development policies, which greatly helped the Republic of Korea's unprecedented fast economic development, are not taken into consideration.

The green job vocational education and training development expansion policy tasks for the green job, set by the Green Growth Committee, are presented. The government tries enhancing technologies, technical manpower training to promote the green industry as the new growth engine. To foster technology functional manpower to promote the green industry as the new growth engine, the government enhances the training of high-quality technological manpower and technical manpower of core green industries, where demand has been on the increase with the industrialization of core green technologies. It designates or creates manpower training centers and pushes forward raising technical manpower through cooperation with sectoral councils in the green industry area.

In addition, as a project is underway to reorganize unemployment training as green friendly so that those leaving non-green industry can swiftly move to green employment, it heightens the possibility of those unemployed people in traditional manufacturing sectors transferring to green-related industry areas. Also, the government enhances to reorganization status of technology, technical manpower vocational education, and training development. Among the political tasks presented on the government's manpower training plan, "the expansion of ability development" is mainly dealt with by the Ministry of Employment and Labor, which can be summarized as the reorganization of Korea Polytechnic,[3] public occupational training organizations (2-year multifunction course), or the expansion of green job training of the national infrastructure strategy job training supported by the government for civil occupational training organization. About 30% of the national infrastructure strategy industry job training is expected to be used for

[3] Korea Polytechnic, which has been taking care of vocational public training in the Republic of Korea, presents a paradigm in education that is future-oriented, dynamic, and innovative. Korea Polytechnic represents the Republic of Korea's prosperous future of an advanced technology. For an efficient college administration and education, Korea Polytechnic runs I–VII colleges with 4 specialized ones, which are in total 11 colleges and 24 campuses all around the country. There are 2-year degree courses, 6 months and 1 year of technician courses, and 500 different education and training programs.

green job training. Going forward, green job training will be executed in the form of project financing as the government encourages companies and related associations to actively participate in the program. Namely, if the training organization constitutes the training curriculum and organizes manpower, facilities, equipment, and training cost on its own and applies for it, the government reviews the program and supports it later. Other than these, the manpower movement, through the retraining of the existing employees, is executed in the form of retraining in the technician courses at Korea Polytechnics.

Korea Polytechnics Reorganization Case[4]

Corporate Body's Level

Korea Polytechnics have reorganized departments based on existing traditional foundation industry into ones related to the green industry areas earnestly since 2009, trying to raise mid-level technology manpower needed for the commercialization phase of the green industry. Specifically, through the department reorganization projects, Korea Polytechnics fostered mid-level technicians in areas of new and renewable energy, carbon reduction energy, LED applications, and the green transportation sector.

Directions of this reorganization plan are, first, to establish a mid-level technician fostering system, which will be necessary at the commercialization phase of green industries. Therefore, manpower fostering sectors and size shall be set based on the manpower supply and demand trend in the Republic of Korea's green industry sector and technology manpower level. Second, the plans aim to expand the vocational training courses in the green industry for young unemployed people with higher education.

Based on such objectives, Korea Polytechnics plan to raise the number of mid-level technical staff through the department reorganization for the 7 years from 2009 through 2015. The departments are being reorganized through public vocational training institutions by each college through collaborations with the regions and industries where Korea Polytechnics are located in the green industry sectors set as of 2009. At public vocational training institutions, the education and training course development, curriculum specialization, teacher operation plan (securing status of related field specialized teachers and instructors from academic-industry cooperation), investment in facilities and equipments, and planned use of them linked with the regional industry base and green technologies are all evaluated for selection (see Table 16.9).

In terms of the selection process, the corporation forms an evaluation committee constituting internal and external specialists and selects through document screening from the submitted applications in the 1st phase and finally selects the reorganized departments through the 2nd phase, oral announcements. In 2010, nine campuses were reorganized to include departments in new and renewable

[4] This section revised and complemented the contents of Ko (2010).

Table 16.9 2010 Green technology department reorganization status

Sector	Campus	Major	Note
Renewable energy	Jeju	Electric Control	Certified technician course
	Iksan	Electric Control	Certified technician course
	Pohang	Electric Control	Certified technician course
	Hongsung	Electrical Measurement Control	Two-year diploma course
	Gwangji	Electrical Measurement Control	Two-year diploma course
Highly water treatment	Daejeon	Industrial Facility Automation	Two-year diploma course
Green transportation system	Pusan	Automobile	Two-year diploma course
	Gangneung	Industrial Diver	Two-year diploma course
	Mokpo	Shipbuilding Electric Control (30)	Two-year diploma course

energy, sophisticated water treatment, and green transportation system. In 2012, 8 more departments are scheduled to be reorganized (see Table 16.10).

Table 16.11 shows Korea Polytechnic University's curricular restructuring plans from 2009 to 2013.

Once selected as a reorganized department through an open process, the reorganized department goes through the following curriculums development process (refer to Fig. 16.3). It organizes the curricula after analyzing the tasks through on-site inspection of companies in the industry, prepares for the facilities and equipment supply and demand plans, goes through review and feedback of industrial specialists, and completes a final checkup of curricula, facilities, and equipment before finalizing all the programs of curricula, facilities, and equipment to be bought for use.

Department Reorganization Case of Chungju Campus, Korea Polytechnics IV

The Chungju Campus of Korea Polytechnics IV (new and renewable energy) was selected as a green education organization that fosters green growth leaders by the Green Growth Committee along with its Changwon Campus (carbon dioxide reduction technology). The Green Growth Committee designated 48 green education organizations which will mainly perform its roles of expanding the pan-national understanding on green growth policies and developing specialized capabilities in green growth. The Committee designated them with the aim of

Table 16.10 Scheduled 2012 green technology department reorganization

Sector	Campus	Major	Note
Renewable energy	Cheongju	Electric Energy	Two-year diploma course
	Daegu	Smart Electricity	Two-year diploma course
	Changwon	Smart Electricity Electron	Two-year diploma course
Low-carbon energy	Gwangreoung	Air-Conditioning Refrigerating	Certified technician course
Highly water treatment	Iksan	Industrial Facility	Certified technician course
LED application	Sungnam	Smart Electricity	Two-year diploma course
	Nam Incheon	LED Applied Electricity	Certified technician course
Green transportation system	Seoul Jeongsu	Automobile	Two-year diploma course

Table 16.11 Korea Polytechnic University's curricular restructuring plans (2009–2013) (Unit: numbers, 1,000,000 KWN)

		Total	2009	2010	2011	2012	2013
Number of courses/department under restructuring	Total	65	13	13	13	13	13
	Technician	50	10	10	10	10	10
	Craftsman	15	3	3	3	3	3
Expected costs	Total	65,500	13,100	13,100	13,100	13,100	13,100
	Equipment	59,800	11,960	11,960	11,960	11,960	11,960
	Facilities	5,700	5,700	5,700	5,700	5,700	5,700

raising green growth leaders and specialists in the area by preparing programs that can systematically spread green growth policies and cultivate experience-oriented learning places.

Chungcheongbuk-do, where Chungju Campus is located, pushes forward with "Green Chungbuk," which includes regional green industry fostering, and prepares for a sustainable Chungbuk, concretizing the national-level green growth strategies at a regional level. Representatively, with the start of Cheongju, the solar valley establishment has been initiated to Cheongwon, Jeungpyung, Eumsung, Jincheon, Gweosan, and Chungju. In Chungcheongbuk-do, there are 21 companies in cell, module parts, and materials companies including Hyundai Heavy Industries, Korea Steel, Shinsung Holdings, Kyungdong Solar, and A-ONE TECH and 11 solar power equipment-related companies. With the location of many large companies investing in solar power industry, the largest production infrastructure of solar power parts in the Republic of Korea has been established. Furthermore, with Chungju International Airport, Chungcheongbuk-do is the most optimum place to act as a hub in Northeast Asia for advancement into the PRC's solar cell market and is also

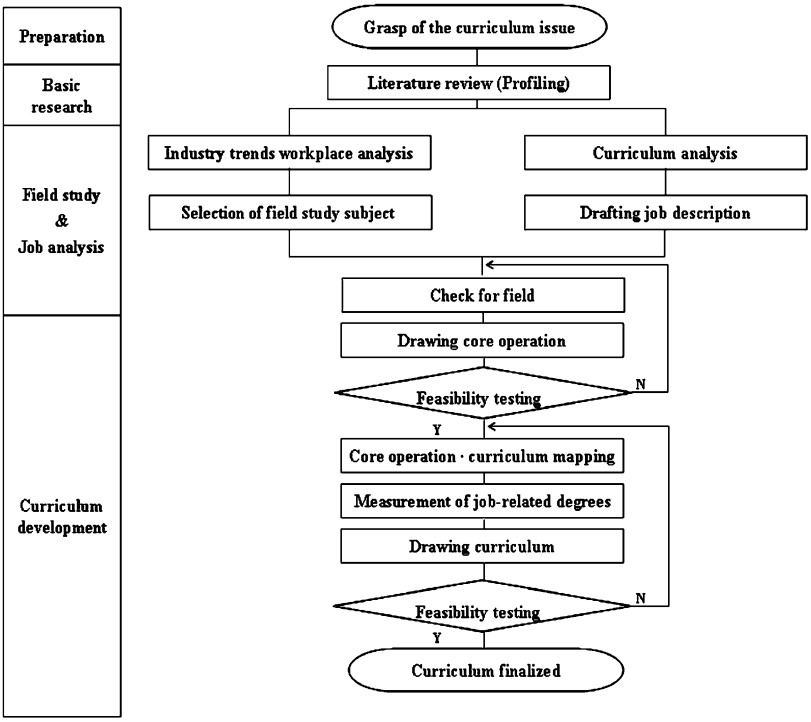

Fig. 16.3 Curriculum development process

equipped with optimum geological conditions for the fostering of solar power as the major growth engine of low-carbon green growth.

With the propulsion of green growth, a specialized industrial complex (on 990,000 m^2 land) will be established in the 2nd Jeungpyung Industrial Complex in Chungbuk for the nationalization, R&D, and certification support of related equipment and parts and materials to enhance global competitiveness of the solar power industry. KRW 65 billion will be invested from 2010 to 2013 to foster a comprehensive support organization related with the solar cell industry. The Solar Cell Comprehensive Technology Support Center promotes "Asia Solar Valley," a solar power industry cluster, by further fostering solar power parts and materials industries through the establishment of pilot line equipment facilities for next-generation cells, supporting tech-intensive companies with pilot scales, fostering manpower, and supporting academy-industry cooperative R&D.

To attain this end, first, Chungcheongbuk-do plans to raise solar power specialists, along with the continued propulsion of 4 major strategic industry-fostering measures of bioconductor, semiconductor, next-generation cells, electric-electronic fusion parts, etc., Second, Chungcheongbuk-do plans to execute six subprojects by inviting solar power companies, forming a specialized complex, fostering manpower, developing technologies, establishing the Solar Cell

Comprehensive Technology Support Center, and designating a special solar district by investing a total of KRW 146.8 billion in the solar power industry from 2010 to 2014 and, of note, by investing KRW 10.0 billion for the promotion of its own projects. Third, Chungcheongbuk-do plans to nationalize the process equipment of production lines and support R&D's process efficiency improvement as well as developing next-generation solar cell core technology (thin film type and dye-sensitized solar cell) by co-establishing Chungbuk TP with Chungju University, Konkuk University, Chungbuk University, Cheongju University, and RIC together with residing companies.

Meanwhile, activities to entice companies have also been initiated with improving incentives tailored to solar companies necessary to establish the production cluster such as company concentration to establish solar power part and materials hub, inviting partner companies, and changing of business types of semiconductor companies. For those companies engaged in solar power businesses, the SME fostering fund and a special economy fund offer support. There is also a priority to revise related regulations such as fund support, technology development, and manpower fostering.

Fostering solar power personnel is the catalyst for the solar power generation. Therefore, Chungcheongbuk-do invested KRW 0.9 billion of regional funds to Chungbuk Semiconductor High School with the aim of securing company competitiveness by fostering specialists in solar power industry, producing solar power parts and materials, and operating related equipment, supporting the specialist raising project in general. In addition, Chungbuk created a solar cell department in a community college, supporting academy-industry R&D-linked manpower exchange programs while creating graduate schools specializing in solar power and pushing forward with solar power research-centered university projects.

New and renewable energy have a lower economic value than existing fossil fuels and has many location restrictions depending on natural conditions such as wind and sunlight. Using its natural propensity for good sunlight, Chungcheongbuk-do set the solar power industry as its main energy source and currently research is being conducted with a view to providing the central region from Cheongju to Chungju with abundant solar power-related infrastructure and potentially designating it as a Specialized Solar Power Industry District to foster the industry.

Tailored to the regional strategies mentioned above, the Chungju Campus of Korea Polytechnics reorganized its electric measurement department to solar power in 2009. After the department was selected for reorganization through public vocational training institutions of the corporation, they made visits to nearby companies such as Techwin and Gyeongdong Solar Co., Ltd. to analyze tasks in solar power plant construction and solar cell module manufacturing sectors. It has led to the development of the following curricula (Table 16.12).

Junior College Reorganization Case: Yeungjin College

In 2010, Yeungjin College changed the existing electric department to the new and renewable energy category in order to raise human resources in the eco-friendly

Table 16.12 Reorganized curriculums of electric measurement department of Korea Polytechnics, Chungju Campus

		Before reorganization	After reorganization	
Classification	Subject	Completion of hours	Completion of hours	Note (maintenance, abolition, new, modified)
Liberal arts	Computer	60	60	Maintenance
	Health and Ability Development	40	40	Maintenance
	Occupation and Society	40	40	Maintenance
Major theory	Electric Theory	60	50	Modified
	Electric Appliance	40	20	Modified
	Automation Control	40	30	Modified
	Power Electricity	20	40	Modified
	Electric Facility	40	20	Modified
	Solar PV Generation	0	30	New
	Solar Cell Engineering	0	30	New
Major practice	Sequence Control	220	160	Modified
	Power Electric Control	100	100	Maintenance
	Electric CAD	120	60	Modified
	PLC Control	140	120	Modified
	Digital Control	40	40	Maintenance
	Control Appliance	140	80	Modified
	Electric Facility	140	100	Modified
	Solar Cell Fabrication	0	120	New
	Solar PV Generation	0	100	New
Project practice	Project Practice	80	80	Maintenance
OJT	OJT	80	80	Maintenance

energy sector, creating two new majors of new and renewable energy and digital electricity (quota of 280 students). Reflecting the fever for green growth, the competition rate for recruiting freshmen was 5.7:1, reflecting the great interest of students in this field. The college order-tailored education agreements with various companies, including representative companies such as LG Siltron; STX Solar Co., Ltd.; Mirinet Solar Co., Ltd.; LUXCO Co., Ltd.; and LS CNS.

The new and renewable energy major in the new and renewable energy category in Yeungjin College will foster specialists equipped with practical technologies such as solar cell process, power generation system, and power transformation technology (see Table 16.14). Order-tailored agreement classes related with this are currently being operated: 20 people for STX Solar Co., Ltd.; 20 for Mirinet Solar Co., Ltd.; 20 for KPE Co., Ltd.; 20 for LG Siltron; 10 for Gyeongwon Co., Ltd.; 10 for LUXCO Co., Ltd.; and 20 for Stetz Chippack Korea (LLC).

The digital electric major will provide core personnel for the electric technology industry, which has been developing to become a high value-added cutting-edge industry as various digital technologies have been fused. This department aims to foster specialized technicians fully equipped with on-site practical capabilities in areas of electric control and power facilities design using computer technologies. The college currently operates various order-tailored education classes with various companies: 20 for LS CNS, Korea Power Construction Association, Korea Engineering Association, Korea Power Safety Association, etc. The courses in new and renewable energy, electricity section are operated as common classes of the 1st semester of freshman year and major classes are operated during the 2nd semester (Table 16.13).

Table 16.14 presents the main subject status on the department of renewable energy electricity in Yeungjin College.

Other than the above programs, Yeungjin College is currently operating short-term education courses for employees supported by the Ministry of Employment and Labor (see Table 16.15). The education program is "Green Energy Power and Electricity Construction Practices," a ministry-supported project in which a consortium was formed with the Korea Power Construction Association and member companies, offering free education to improve the vocational ability of SME employees in the electric industry. In 2010, a total of 80 employees were educated during the 4-day reeducation sessions.

Conclusions

As the climate change policies are activated within the environment industry, and the green growth strategies are activated across all industries, demand for related personnel increases. In the meantime, as labor moves to the growth industry sectors, employment is expected to decrease in the waning industry sector. Furthermore, in the labor market, there will be a discrepancy between manpower with traditional proficiency and green experienced manpower newly required by the industry society. Such ripple effects on the labor market show the positive and negative effects of green job growth.

Although the effects of green jobs on the employment and labor market are mostly positive, we cannot neglect the other side of the employment effect. That is, existing jobs will disappear as many new jobs are created because non-regular workers increase as regular workers increase. Although it is believed that green jobs are related to future technology, all jobs are also noteworthy. The net size of newly created jobs within technological development and new industries is not as big as expected. It indicates that it is more important to facilitate green growth through education and training for technology and skill transfer of existing manpower by changing jobs in existing industries to fit the green environment.

In this respect, the Government of the Republic of Korea has tried to transform the technology and skill of existing manpower to fit the green industries in tandem

Table 16.13 Curriculum department of renewable energy electricity in Yeungjin College

		Major in renewable energy		
		Freshman	Sophomore	Sophomore
		2nd semester	1st semester	2nd semester
Freshman 1st semester (corequisite)	Choose major	Social Service	Social Service	Vocational Ethics and Relationship
		English Conversation	E-Learning Selection	Visual Programming
Social Service		E-Learning Selection	Electric Installation	LED Display Lighting
E-Learning Selection		Electric Apparatus Practice	Photovoltaic Power Generation System	LED Display
Elementary Mathematics		Sequence Practice	Inverter Electric Power Modification Practice	Applied Practice
Digital System Practice				
Elementary Experiment Practice		Solar Cell	General Equipment Maintenance	Monitoring System
AutoCAD		Renewable Energy		OJT
Sensor Applied Practice		Applied Practice	Electric Light Control Practice	
		Electronic Circuit Practice	Practical English	
C-Language		Major in digital electricity		
Renewable Energy Basic Practice		Freshman	Sophomore	Sophomore
		2nd semester	1st semester	2nd semester
Electric Circuit Theory		Social Service	Social Service	Social Service
		English Conversation	E-Learning Selection	E-Learning Selection
		PLC Practice	Electrical Instrument Practice	Vocational Ethics and Relationship
		Electrical Instrument	Electricity and Fire-fighting Installation	Electric Power and Electricity Practice
		Electric Power System	Electricity Control Practice	Electricity Applied Practice
		Microprocessor Visual Programming	Electric Installation Quotation	LAB NEW Applied Practice
		Sequence Practice	Computer Applied Practice	Electric Motor Applied Practice
			Electricity Application	OJT
			PLC Applied Practice	

Source: Kim (2010)

Table 16.14 Main subject status on the department of renewable energy electricity in Yeungjin College

Basic practice on renewable energy	Introduction to renewable energy-related technology
	The understanding of photovoltaic power generation through photovoltaic system
Solar cell	The understanding of types and characteristics of solar cells
	The understanding of solar cell manufacturing process
Applied practice on renewable energy	Introduction to renewable energy technology-related intensive theory as renewable energy basic practice
	The understanding of wind power generation and fuel cell practice apparatus
Photovoltaic power generation system	Principle of photovoltaic power generation, construction preparation of photovoltaic power generation system
	The understanding of process on planning, installation, and testing
	Market trend and prospect of photovoltaic power generation
LED display lighting	The understanding of characteristics on LED display lighting
	Design technology on LED display lighting power supply
	Market trend and prospect of LED display lighting

Source: Kim (2010)

Table 16.15 Contents of practical training courses on green energy electricity and electric work in Yeungjin College

Day 1	Overview and structure of solar energy power plant system, types and characteristics of solar cell, module
Day 2	Outlines and types of inverter, construction planning and licensing, legislation on Renewable Energy Development Project
Day 3	Installation and construction of photovoltaic power generation system, installation of photovoltaic module array, installation and construction of monitoring panel
Day 4	Construction of photovoltaic power generation transmission and distribution system, maintenance of photovoltaic power generation plant, system testing operation and inspection

with green growth and developed new personnel who will lead the green industry. This section focuses on the discussion of the strategies and changes on vocational education and training for developing green talents who would support the green growth of the Republic of Korea. However, as the industrialization of the Republic of Korea's economy was developed under the backdrop of nation-led economic development policies and national human resources development policies, the characteristics of the Republic of Korea's vocational education and training are first introduced to provide basic understanding on such attributes. This is because it would be hard to understand the Republic of Korea's vocational training program newly established in accordance with the nation's green growth policies, if the human resources development policies, which greatly helped the Republic of Korea's unprecedented fast economic development, are not taken into consideration.

The green job vocational education and training development expansion policy tasks, set by the Green Growth Committee, are presented as follows: green job

employment support and manpower training plans. Mainly, policy tasks are presently aimed at training green manpower on a pan-government basis and promoting green growth by effectively reorganizing the manpower through improving the condition necessary for labor mobility.

Vocational Education and Training Policy Overview Under the Green Policy

First, to foster technology functional manpower to promote the green industry as the new growth engine, the government enhances the training of high-quality technological manpower and technical manpower of core green industries, where demand has been on the increase with the industrialization of core green technologies. It designates or creates manpower training centers and pushes forward raising technical manpower through cooperation with sectoral councils in the green industry area. In addition, as a project is underway to reorganize unemployment training as green friendly so that those leaving non-green industry can swiftly move to green employment, it heightens the possibility of those unemployed people in traditional manufacturing sectors transferring to green-related industry areas.

Second, to make the existing industries green, the government established a green employee transfer training system with the advance of greening of major existing industries such as automobile, steelmaking, shipbuilding, and pushed forward with the policies that support education and training expenses when providing green industry-related education and training. In addition, to improve the effectiveness of employee reeducation training, support has been offered for the expansion of green factory innovation by forming an HRD consortium and supporting green factory innovation.

Third, to support the training of core personnel who can increase the green industry competitiveness of SMEs, detailed supporting measures have been developed and propelled that would support SMEs' core personnel with education expenses and wage subsidy (minimum wage 100%) in green technology, management innovation. The measures offer (annually 1,000 persons) SMEs' high-quality research personnel employment support in the green industry area such as green technology development. Furthermore, to train beginning to intermediate-level technicians responding to the green demand for regions and industries such as the formation of green clusters based on regional characteristics, green technology manpower has been raised in Korea Polytechnics (6 areas, 38 campuses), the regional base public training organization increasing from 300 in 2008 to 1,800 in 2012.

Fourth, while initiating green qualification items to establish the national technology qualifications system of the green industry and leading the training of green industry technology manpower, the government reorganizes the existing national technology qualifications to be green friendly, enhances the quality control of the green qualifications, and expands the opportunities to acquire green qualifications, consequently making the overall national technology system play an important role in training green talents.

Finally, by continuously increasing the proportion of investment in basic and original green technology, the government expands green technology-related researches and promotes investment in fusion green technologies such as IT and NT, which will lead future green growth. In addition, by paying attention to the need to secure the green growth engines by training core green technology talents, the government supports engineering colleges (graduate schools) in training green-related specialized graduate schools, continues to support basic research support programs in the science engineering and fusion basis research fields, and enhances related education and research capabilities. Through the activation of developed basic technologies, the government simultaneously enhances the cooperation between academic research organizations and through these efforts creates base technologies and expands the training of specialized manpower.

The Republic of Korea must be consistent in carrying out policies and projects by conducting dimensional and integrated diagnoses on the scale of further green energy industry, the scope of further enlargement, and manpower supply and demand in both qualitative and quantitative terms. It is necessary for policies for green energy to be pushed ahead with a strategic road map revolving around practical administrative and financial supports as well as the modification of various laws and regulations related to training manpower for the green energy sector.

In the cases of green jobs, jobs have been created as the Republic of Korea has set green growth at the forefront of the new changes and has pushed forward intentionally due to various international economic and environmental reasons. However, it is important to recognize that these jobs are not created by a natural link between education and labor market, but rather as a result of efforts to achieve the government's policies. Various vocational training programs for manpower development are necessary to support the government's green growth policies and researches.

Republic of Korea's Experiences Helpful to Less-Advanced Countries in Asia

First, less-advanced countries should establish a system to promote green skill training. They should establish a green skills training system focusing on companies and their employees based on the demand for a market-friendly skill development system and customized skill development systems.

Second, those governments should implement skills training policies that can support various training activities such as informal training, formal training, and blended learning for green growth.

Third, the direction of support needs to shift toward one that can lead and induce green growth by promoting participation in skills training of a customized support system.

Fourth, to promote the programs and action plans for skills training described above, the Republic of Korea can expand its multilateral programs and be ready to cofinance all the support activities in collaboration with other international organizations for more effective implementation.

Fifth, the Republic of Korea believes that one of its best possible contributions to less-advanced countries would be cooperating with them to promote skill development and make progress toward green growth. In order to promote green growth strategies for improvement of green skills, the Republic of Korea can provide efficient policy directions to support them in achieving green skills training for green growth.

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Chapter 17
Hong Kong, China Employers' Perspectives on a Carbon-Constrained Economy and How Technical and Vocational Education and Training Should Respond

Rupert Maclean, Eric Tsang, and John Fien

Introduction

Climate change is generating economic and environmental dislocations that are set to increase in the years to come (IPCC 2007). This move will lead to significant changes required in adaptation and mitigation policies (Martinez-Fernandez et al. 2010). These changes in policy will also provide opportunities to those cities and regions that seek to address climate change by pursuing lower emission technologies. Their actions in doing so will see the reengineering of established production techniques and boost demand for climate-compatible goods and services. Those places that best anticipate and respond to these needs will be positioned for significant growth in the years ahead (Stern 2009). Various studies in the literature on the impact of Climate change and employment (e.g. Martinez-Fernandez et al. 2010) suggest that the impact of climate change on the global labour market is uncertain although indications are that there is an increasing emphasis on green growth in the business and industrial sector. As such, the labour market can benefit from an increasing demand for employees equipped with the

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desired green skills (Fien et al. 2008). As there were no similar studies in Hong Kong, China, this article is a first attempt to address this issue.

The World Bank valued the global carbon market under the Kyoto Protocol's Clean Development Mechanism (CDM) at $64 billion in 2007 and predicted that it would rise to $500 billion by 2012. In reality, it rose to a peak of $144 billion in 2009 before dipping to $142 billion in 2010, possibly due to uncertainty about market rules following the Kyoto Protocol's expiry in 2012. Clean technology has become the fastest growing sector in venture capital and private equity investment, with the top 10 banks in Hong Kong, China committing 10%–15% of project financing to renewable and clean technology (The Climate Group 2008). As a result, carbon emission reductions through energy-efficient transport, buildings, industrial equipment, renewable energy and waste reduction are creating both business opportunities and improved environmental outcomes. The long-term impact of the research reported herein will be enhanced prospects for economic prosperity and environmental sustainability in Hong Kong, China.

Hong Kong, China lacks natural resources and is heavily reliant on the service sector to provide employment opportunities, as the majority of manufacturing operations have relocated to mainland PRC. Manufacturing now employs less than 4% of the workforce, and traditional vocational skills are no longer required. The construction industry employs approximately 8% of the workforce, and the largest sector, encompassing wholesale/retail trade, catering, hotels and food services, employs approximately 32.6%. Transport, storage and communications employ 12%, finance and real estate employ 18% and government and social/personal services employ 25% of the workforce.

As Hong Kong, China is a service-based city without energy-intensive manufacturing industries, its major contributors to greenhouse gases are power generation (64%), transport (16%), waste disposal (9%), other energy sectors (7%) and industrial processes (3%) (Climate Change Business Forum 2009). The Chief Executive's 2010 Hong Kong Policy Address (Tsang 2010) stated that by 2020 the fuel for electricity generation would comprise 40% natural gas, <10% coal, 3%–4% renewable energy and up to 50% imported nuclear fuel, using 2005 as the base. The switch to cleaner fuels is expected to reduce carbon intensity by 50%–60% and greenhouse gas emissions by up to 33%. The actions necessary to achieve these targets include the control of emissions from electricity generation, regulation of transport emissions, significant reforms in supply chain management and logistics, adoption of emission reduction projects in the manufacturing sector, household and office energy conservation and the mandatory implementation of building energy codes.

In 2010, the Environment Bureau of the Government of the Hong Kong Special Administrative Region of the People's Republic of China issued a Climate Change Strategy and Action Agenda Consultation Document for Hong Kong (Environment Bureau/HKSAR Government [of the People's Republic of China] 2010), which identifies a number of key sectors as 'carbon-vulnerable', namely, electricity generation, property development, construction, transport and hospitality. These industries will inevitably face major changes as a result of carbon constraints and will thus

require different skills from their technically and vocationally trained employees in future.

However, with such change comes opportunity, and the Environment Bureau/HKSAR Government [of the People's Republic of China] (2010) has argued that 'going low-carbon' will 'generate opportunities in green and energy-efficient technologies and applications' as 'a promising new economic growth area in the coming decade'. Where environmental concerns were once associated with the problems of high costs and inefficiency, the climate crisis response is increasingly being associated with high-growth potential and increasingly attractive profits and returns.

As industries reengineer their resource and energy inputs, supply chain management, logistics, the design and construction of the built environment, production processes, services and water and waste management practices all require significant alterations to reduce carbon emissions. If these changes to economic practices are to be achievable and sustainable over the long-term, then the training of the general labour force must become a priority.

Currently, Hong Kong, China's technical and vocational education and training (TVET) sector requires that 5% of course content be related to environmental issues (Chan 2009). However, climate change and sustainable development constitute a small part of that content, and the specific competencies that students need to cater for economic, societal and environmental sustainability are not clearly delineated. The readiness of many teachers to take up these challenges may be compromised by commitments to prepare for other educational changes and the constant need to reinvent courses to suit industry requirements (Hung 1998). The TVET sector thus faces significant professional development challenges.

TVET has an important role to play in meeting the challenges of the new economy because of its close relationship with industry. As local industry adopts new international and industrial standards, vocational educators need swiftly and effectively to come to terms with this ongoing industrial reorientation. Industry also has an essential and pioneering role to play in influencing education for sustainability in ways that are embedded in the industrial reality of the local economy, which has major implications for economic and environmental sustainability and the local culture. Government success in reducing carbon emissions by 25% by 2030 will hinge not only on the cooperation of large companies but also on changes in the behaviour of the population as a whole, especially skilled workers.

To gain an initial insight into what employers perceived as key aspects of a greening economy, 15 representatives from potentially future carbon-constrained businesses were interviewed. Information was also sought from Hong Kong's Vocational Training Council (VTC) on 18 industries, with questions focusing on trade-specific environmental considerations in vocational training diploma programmes.

The findings of this preliminary qualitative study indicate a range of employer views, and it is hoped that further, more detailed studies will follow to support recommendations for changes in TVET policies for new and revised curricula, teaching packages, pedagogical approaches and campus operations. The ultimate goal is to enhance the skills and employability of Hong Kong, China's future workforce.

Research Methodology

The purpose of this initial study is to collect information that will be used as input to the development of the rest of the study. This involves the identification of opportunities for industries in Hong Kong, China's to respond to a carbon-constrained future. Industry statistics and reports were analysed to identify carbon-vulnerable industries in Hong Kong, China's as well as those where there may be economic opportunities emerging for new industries or commercial activities from climate change. Interviews are being conducted (November 2010) with key representatives in these sectors, and NGOs, to identify (1) the occupations where new or reengineered jobs are being created (or need to be created) to meet the opportunities emerging from climate change and (2) the sustainability and generic competencies required of employees in these positions and industries. Interviews were also conducted with policy makers in the Hong Kong, China's VET system to identify changes that have already been implemented or planned, and will identify what would be required in order to respond to industry needs, where changes would be required in future, and the barriers that would need to be overcome. Interview data were recorded, transcribed and coded thematically.

One-on-one interviews were conducted with representatives of both carbon-vulnerable industries and industries for which carbon constraints present possible economic opportunities, as identified through analysis of industry statistics and reports. Interviewees included representatives of the electricity generation, transport, construction contracting, engineering, textile, tourism, hospitality and beauty training sectors. Interviews were also conducted with representatives of NGOs.

The Vocational Training Council (VTC) of Hong Kong, China's through its corporate environmental office distributed a five-question survey to its 18 internal training boards, which encompass accountancy, automobiles, banking and finance, industry, building and civil engineering, IT training and development, management and supervisory training, technologist training, electrical and mechanical services, electronics and telecommunications, import/export/wholesale trades, mass communications, metal working, plastics, printing and publishing, retail trade, security services, textile and clothing and transport logistics.

The interviews were conducted in a semi-structured fashion. Experience suggests that business representatives can display differing reactions when asked about environmental initiatives, ranging from a very positive response and willingness to talk to an almost apologetic response when an interviewee does not realise that initiatives have been taken. In the latter case, it is necessary to draw out the desired information carefully to prevent the interviewee from becoming uncooperative. Four broad discussion topics were used, with the intention of conducting the interviews as conversations.

Under the theme of *Targets and Policy*, general questions were posed to solicit the interviewee's views and attitudes regarding the feasibility of the government's energy and carbon emission reduction targets in the context of his or her employment sector. The questions within *Initiatives and Plans* asked about business

practices, plans and views concerning energy saving initiatives and carbon emission reductions. Those under the theme of *Fundamental Changes* asked the interviewees to consider future developments within their sector and to give their opinion as to whether there would be fundamental changes in their business and in attitudes towards these changes in the context of the low-carbon green economy. Finally, *Workforce Skills* included questions designed to elicit interviewees' views on skills needed in the workforce and changing training needs in the near and longer term.

During the discussions arising from these four areas, the interviewer sought to elicit information on whether the interviewees' businesses employed workers with vocational skills, the types of qualifications they needed, their in-house training provision, the skills that TVET facilities should provide now or in the short term and the skills that they will need to provide in the medium to long term.

The five questions that the VTC posed to its internal training boards were related to the inclusion of trade-specific environmental study elements and the percentage of environment-related content in VTC higher diploma (HD) and Diploma of Vocational Studies (DVS) courses for different industries/sectors.

Employer Responses to the Issue of Carbon Constraints

Electricity-Generating Sector

One representative of the electricity-generating sector explained that the government's target of a 25% energy reduction by 2030 could be achieved. For example, fuel consumption could be reduced by 1% per year through more energy-efficient practices. Electric vehicles had been in use since the 1980s, and 10 new such vehicles were purchased by the electricity-generating company in 2010. Hong Kong Island had charging infrastructure that could be used at no cost until the end of 2011. The ratio of gas-fired electricity generation had risen to 33% of the total by 2010, with the Lamma Power Station achieving a 13% reduction in CO_2 emissions. The electricity-generating sector wanted to see collective effort from all parts of the community to promote energy conservation through energy efficiency-related services and public education, the representative stated, and it supports further research into more cost-effective renewable energy production.

In response to questions on the environmental initiatives introduced, the electricity-generating industry representative advised that in 2008 the industry successfully reduced its carbon footprint and complied with the revisions of the Hong Kong Business Guide to Emission Reduction published by the Climate Change Business Forum. The representative's company was committed to the Carbon Reduction Charter initiated by the Government of the Hong Kong Special Administrative Region of the People's Republic of China in 2008, and carbon audits had been conducted for corporate buildings, electricity installations and selected buildings at the Lamma Power Station. In 2009–2010, the company

achieved a 13% reduction in its carbon footprint by reducing electricity and paper consumption and water and vehicle fuel use between 2007 and 2009.

The electricity-generating sector promoted energy efficiency and conservation through the provision of advisory services to residential and commercial customers and support for public education. Since 1999, for example, the representative's company had offered more than 1,000 professional energy audits and energy saving solutions, helping business customers to achieve average energy savings of 5%–20%. It also launched a GREENPLUS programme to bring together different parties, including government departments, an energy advisory committee, professional bodies and academics to exchange ideas and technical expertise on the development and implementation of environmentally friendly solutions. At the community and corporate level, the there were efforts to encourage behavioural changes, and programmes were provided to promote energy efficiency. For example, the Go-Green programme had promoted a green office culture since 2005 and helped to reduce electricity consumption in Hong Kong, China offices by 9% between 2005 and 2009. Building energy codes had also been implemented, in addition to such energy conservation measures as green roofs, vertical greening and smaller window areas.

When asked about the fundamental changes to the electricity-generating industry and individual businesses in a carbon-constrained economy, the representative suggested that such changes could be both risks and opportunities. In relation to promoting electric vehicles, the representative mentioned that the company had introduced quick charging equipment and advocated a building efficiency code to ensure that its infrastructure and transmission work was environmentally friendly and energy efficient.

Another electricity-generating industry representative recognised that the power industry generated two-thirds of Hong Kong, China's CO_2 emissions and thus plays an important role in reducing carbon intensity. When asked about the industry's short- and long-term TVET needs, this representative emphasised the need for staff to be environmentally aware, to care about environmental protection and to have diverse disciplinary backgrounds, such as the social and environmental sciences.

The representative stated that the company employed craftsmen and technician trainees undertaking VTC training programmes. More diverse training would encompass chemical, mechanical, civil and environmental engineering, and new skills for engineers would include energy and carbon audit skills.

A third representative of the electricity-generating industry emphasised that staff needed to keep up with technical developments and new technology in the power industry to support the development of sustainable energy businesses and energy efficiency and conservation initiatives. The representative predicted that the increased use of clean energy would make necessary staff capability in related technical areas, although existing skill sets and technical capabilities would remain important in the near to medium term.

This representative also predicted that high-carbon industries and associated skills would gradually disappear, particularly in developed economies such as Hong Kong, China. Skills related to carbon-intense coal-fired generation and internal combustion engines would be gradually replaced by clean/green generation

technologies such as electric vehicles. The representative talked about the training scheme provided by the Hong Kong Institution of Engineers (HKIE). This was a credit-based scheme in which graduate trainees receive training in mechanical, electronic/electrical, environmental and civil engineering.

Transport Sector

The transport industry was represented in the interviews by representatives of a rail operator, an airline and an airport operator. As the rail sector had already achieved a 19% reduction in energy use, the rail operator representative advised that it would be very difficult to achieve a further 25% reduction because of the high cost of replacing facilities to improve energy efficiency. However, the transport industry (including the bus companies) was very proactive in energy reduction. The representative commented that the 25% energy reduction target and proposed change in the fuel mix for electricity generation was 'aggressive but achievable'. The rail operator monitors contractors' use of materials and energy, such as concrete, steel, fuel and electricity, according to its 2010 annual report.

The airline representative described the 25% energy reduction target as 'ambitious but doable'. For ground emissions, 25% was considered realistic. However, for airlines most emissions are from aircraft.[1] Other sources of energy use were miscellaneous vehicles and equipment and office buildings. Energy-efficient equipment had also been installed, with a 10- to 20-year cost recovery period, and buildings were constructed in accordance with Hong Kong China's energy-efficient building code. The airline had approximately 750 suppliers and covered 150 destinations. It exercised strict control over such suppliers as catering services and laundry and other subsidiary companies, which have a great impact on carbon emissions and water use.

The airport operator's representative expressed a commitment to reducing carbon emissions by influencing suppliers and contractors and imparting information and education through lectures to suppliers and other organisations. The energy reduction target of 25% by 2030 was considered tough but realistic. The focus was on 'energy efficiency', such as replacing traditional lighting with light-emitting diodes (LEDs) and implementing more efficient temperature controls. Contractors were encouraged to replace existing vehicles with electric vehicles, but there was no way to enforce this.

The rail operator representative stated that the railway and property sectors were reducing their energy use. There had been a variety of initiatives, ranging from stopping escalators during off-peak periods to the use of LEDs in trains, stations and platforms, installation of platform screen doors and optimisation of building management systems in both transit facilities and properties. The sector's major

[1] Aircraft emissions are not currently counted as part of Hong Kong, China's carbon footprint.

initiative was computer-controlled train management for optimised energy use. The operator used lighter trains, which were more energy efficient, and had installed energy-efficient lighting.

The airline representative discussed the 'four pillars' of airline operations, which the International Air Transport Association (IATA) defines as the modernisation of fleets with more fuel-efficient aircraft to reduce CO_2 emissions, the adoption of operational procedures that make use of the most fuel-efficient routes, the use of an efficient infrastructure to reduce additional weight on flights; and the employment of economic instruments to reduce carbon emissions. On the ground, the airline had established one of the largest electrical vehicle fleets in Hong Kong, China, numbering more than 100 electric vehicles. In the airline's buildings, solar heaters were used and energy for lighting was generated by a wind turbine. The airline planned to further reduce electricity consumption through the use of more advanced controls, such as more energy-efficient flight simulation equipment during training sessions. The Fly Greener campaign was initiated to encourage passengers to pay for carbon offsets.

The airport operator representative discussed the environmental measures that have been adopted since the airport's construction. In 2008, the Government of the Hong Kong Special Administrative Region of the People's Republic of China published carbon audit guidelines, on the basis of which the operator undertook its first carbon audit. In 2009, it extended the audit to the entire airport, including terminal buildings, office towers, airlines, ground service contractors, equipment companies, government departments and catering companies. Around 40 companies took part in this audit, the results of which indicated that electricity accounted for 70% of the airport's carbon emissions, with ground services and cargo accounting for another 10% each. The 40 companies involved developed carbon reduction plans based on these results, later publicising them online, quite a novel exercise in Hong Kong, China.

The transportation industry representative thought that the industry would react to what the customer wanted. There was a perception that transportation designed for low-carbon emissions was more expensive. The representative recommended that detailed studies be undertaken to streamline the connections amongst different modes of transport.

The airline representative described the aviation industry as a growing sector and noted that sustainability posed a considerable challenge that required the examination of everything from food to seat fabric. Carbon reduction was the most challenging issue, and this would fundamentally change the way the industry worked. The representative recognised that reducing carbon emission also reduced operational costs. Finding a way to survive without government subsidies while meeting customer expectations and reducing its environmental impact would represent a major challenge for the industry.

The airport operator's representative stated that the operator intended to electrify its ground service equipment to reduce carbon emissions and improve air quality.

In light of increasing concerns about climate change in the aviation industry, the operator had to consider the environment and sustainability in its further development, such as in plans to expand the number of runways and make greater use of renewable energy. The representative said that energy-efficient buildings would be constructed as a part of airport expansion. Staff at the Airport Authority had developed a sense of responsibility for the environment.

The rail operator representative reported that the industry was concerned about lifecycle and cost-benefit assessments and providing solutions to mobility issues using BATNEEC (which stands for 'best available technologies not entailing excessive cost'). The rail company still required university-educated staff with the capability to understand such concepts as global reporting indicators and environmental cost-benefit analysis. It was suggested that vocationally trained workers needed skills to work with ventilation and heat-insulation systems, electrical work and the installation and repair of energy-efficient building materials.

The airline operator considered that it was difficult to find people with environmental or engineering background and skills as well as understanding of business, policy and aviation regulations. Environmental communication skills were required for environmental specialists in the aviation industry for PR purposes. Environmental business skills such as knowledge of carbon auditing and reporting were considered necessary.

The airport operator organised training sessions for its business partners and airport staff, for example, to demonstrate the benefits to the airport (and hence the community) of electric vehicles compared to conventionally powered vehicles. Special training is required for the maintenance of electric vehicles, which is currently provided only by the equipment suppliers.

The rail operator provided in-house training for employees. Retraining on environmental and sustainability issues was also provided to ensure that staff understood how to report such issues with transparency. Training was also provided in lifecycle assessment, reporting and learning through experience. Attendance at evening classes, seminars and courses was encouraged.

The airline operator encouraged training but did not make it mandatory. Junior staff were encouraged to take courses in carbon auditing and environmental management systems (EMS). Briefings were provided for senior staff, but no formal training. Although the operator conducted no in-house training, it employed external trainers from, for example, the University of Hong Kong and Corporate Social Responsibility Asia, to teach courses on environmental standards and environmental auditing, monitoring and reporting. E-learning courses on environmental issues were also available to employees at no cost. The representative emphasised that no training on emission trading schemes was available locally, and that experience-based on-the-job training would be helpful.

Finally, the airport operator held briefing sessions for senior management on the issues of carbon constraints and carbon auditing. It also provided training and workshops free of charge to external organisations working at the airport as part of its commitment to influencing business partners.

Construction Sector

The construction industry representative indicated that contractors were not particularly active in implementing changes in their working methods to effect carbon reduction, and that any changes that did take place were either for cost savings or in response to changes in the law or government guidelines. The representative stated that construction waste disposal charges had been implemented in recent years and that more stringent disposal criteria are encouraging the reuse of materials on-site. Furthermore, recycled materials were gaining in popularity, and clients, engineers and contractors were much more open-minded about and amenable to suggestions for the use of these materials.

This representative noted that changes in the construction industry occurred very slowly and it was unlikely that any radical or fundamental changes would occur. Although building design was gradually changing in line with the principles of the building environmental assessment method (BEAM), that did not involve radical changes. The construction industry representative further stated that workers in the sector did not need special training in the use of new materials because they always came with detailed instructions for handling and use. This demonstrated the power of market forces because products that were not easy to work with or needed special skills would not be selected.

Finally, the representative reported that environmental staff were required to take the training courses provided by the Construction Industry Council. The EPD also provided information on environmental laws and guidelines, he said, and there is input from industry practitioners and construction contractors. On-site environmental staff then provided information to workers on good site practices for preventing nuisance (noise, dust, silty run-off, vehicle cleaning and stockpiling). In addition, environmental good practice extended to office procedures, such as switching off lights and air conditioners in unused offices. The aim was to make environmental issues a matter of routine.

Property Sector

The property industry representative considered the government targets to be challenging but achievable in light of available technology and political and economic concerns. However, the use of renewable energy may not produce positive environmental benefits if carbon emissions from production are taken into account. Solar power for the provision of hot water was one practical measure that could be introduced.

This representative further noted that high-efficiency lighting systems, such as LED lighting, and air-conditioning systems had gained popularity in recent years. Knowledge-based energy management that focuses on the use and analysis of operating data to optimise heating, ventilation and air-conditioning systems were

also achieving energy savings. The challenges facing the property industry included identifying well-trained technical staff who can make a good business case for energy efficiency initiatives to senior management, convincing decision-makers that value should be placed on reducing carbon emissions, adopting new technology and the government's carrot-and-stick approach, which involves grants for the implementation of energy efficiency coupled with economic instruments to discourage waste. It was also emphasised that the mandatory building energy code was driving the industry to prepare for and carry out energy audits.

The property industry representative argued that businesses with less dependence on energy or those that transferred the cost down the supply chain would be most proactive in seeking opportunities in the low-carbon economy and could benefit most from a carbon-constrained future, in the property industry representative's view. In this context, fundamental changes could occur in regulations, public demand, carbon costs and the availability of information to increase awareness of technological advances. The representative pointed out that businesses that managed the risks of a low-carbon economy would see it as an opportunity rather than something to be feared, and that this could be used to improve competitiveness, profit and company image.

This representative also emphasised the importance of adapting energy management technology knowledge acquired in universities to the commercial environment and of getting information across to non-technical decision-makers. A commitment to environmental issues at the management level was needed to drive the industry and influence government.

Tourism Sector

The tourism industry representative highlighted the sector's commitment to promoting Hong Kong, China's diversified tourism appeal while supporting environmental protection measures, such as the development of ecotourism facilities for green tourism, nature conservation and education. Examples include the Hong Kong Wetland Park and Hong Kong National Geopark. The representative was enhancing staff environmental awareness and knowledge by setting up electronic operating procedures and displaying posters with environmental messages in the office.

Employers' Responses to Opportunities Provided by Carbon Constraints

NGO Sector

The nongovernmental organisation (NGO) representative advised that it was an NGO's job to work with businesses to achieve government targets for carbon

reduction and energy savings, noting that 85% of current emissions came from electricity generation. Government policy was for the use of coal to be phased out by 2030, which put pressure on the electricity-generating companies to adapt. However, the phasing out of coal provided opportunities for the consideration of alternative means of energy generation.

The NGO representative also pointed out that the shipping and aviation industries accounted for a large proportion of emissions in Hong Kong, China. There was pressure to encourage container ship operators to change to low sulphur fuel (<0.5%) when they came into port in Hong Kong, China and a number had already agreed to do so. At the individual consumer level, there was a responsibility to buy organic food and/or sustainably produced goods, even though they may be more expensive. Other individual initiatives to reduce emissions included reductions in travel, the consumption of less meat and the purchase of locally produced goods. The NGO representative also described an initiative to establish a Building Efficiency Fund to allocate funds for carbon audits and building upgrades. The NGO was identifying the path by which to move Hong Kong, China towards a low-carbon economy through appropriate investments, generating ideas, demonstrating good corporate behaviour and working with government.

Engineering Sector

The engineering industry representative considered the government target to be definitely achievable by 2030 and cited the example of one contractor that was active in energy reduction through such means as painting site offices with reflective paint to reduce the use of air conditioners. This had the advantage of saving money and being environmentally sustainable. It also required no special skills or technology. A sustainable construction framework was being developed, although that was challenging as it required changes not only in procedures but also in mindset.

The industry had been working hard on the sustainability issue in the last 10 years to enhance performance and reduce costs in a holistic way. Information was being collected in Australia and the Asia-Pacific as well as from company offices in the region to identify their carbon footprints. The company's new Hong Kong, China head office building was designed in-house with energy efficiency as a key design element.

Furthermore, carbon footprint planning was being developed for personal and business travel, and requests for sustainability strategies are being received from clients. For example, the company had received requests for the design of eco-friendly cities and sustainability assessments for cycle tracks, bridges and highways, and the English Schools Foundation had commissioned it to carry out carbon audits of day-to-day school operations. The company had also established a network that brought together people from different divisions to showcase projects. The interviewee reported that the company had achieved a 5% year-on-year overall reduction in energy consumption across its different operations, which had also reduced carbon emissions and costs.

Textile Sector

The textile industry representative commented that the government's reduction targets were achievable, as many companies and factories wasted energy. The company had implemented such measures as installing energy-efficient lighting and using air conditioning sensibly to help to reduce energy consumption. The representative also cited examples of new dyeing procedures, such as those that do not require boiling water, which are more energy efficient. Energy-efficient machinery was now available. One buyer even required the company, as a supplier, to measure its carbon footprint as part of the buyer's environmental reporting requirements.

Hospitality Sector

A food and beverage manager from the hospitality industry expressed concern over the difficulty of implementing energy-saving measures, as it was necessary to provide clients with what they need. For example, it would not be possible to close the kitchens or certain areas of the club for parts of the day, unless this was actually requested by the members. However, the representative did acknowledge that environmentally friendly lighting and more energy-efficient equipment could be installed when the club was due for renovation. The club provided a large amount of imported bottled water, but, again, this was in response to member demand and not amenable to change. The manager noted that kitchen staff were aware of the need to reduce costs, and as a result, food wastage was minimised through careful and flexible menu planning. This was an area in which vocational training could have a positive impact. Catering students could be trained to consider food costs and be taught techniques for minimising food wastage.

The manager said that the club has discussed an initiative to buy organic vegetables, but doing so depended on costs. The club promoted organic foods and supported the organic farm run by the government through the promotion of its produce. For operational reasons, there was a preference for labour-saving products such as packaged organic milk, which also sold well.

Therapy Sector

The therapy industry representative indicated that energy conservation was not a priority. This was a relatively new business sector and it had not yet developed a sense of environmental awareness, although in future energy saving concepts such as the use of more energy-efficient equipment could be incorporated into training courses. The representative noted that European products were more environmentally

friendly and could be used to a greater extent. Over the long term, less equipment could be used for treatments that could also be provided by hand. The representative considered it important to develop an industry standard for protecting the environment.

Employers' Perspectives on Vocational Training for Green Jobs

The NGO representative indicated that new jobs were emerging in carbon auditing and design and that skills upgrades are required for such jobs as facilities maintenance. Although it could be clearly seen that such industries as construction have opportunities to become more sustainable, change was also possible in less obvious occupations such as accountancy, which could, for example, include carbon auditing or trading in the services they provide. Jobs in teaching, retail, packaging, stock management and the carbon labelling of goods could also change, and office managers would need to be aware of paper sourcing and usage and know how to recycle efficiently. Building mangers also required training in energy efficiency. The representative noted that 900 carbon auditors, filling a new green position, had been trained in Hong Kong, China in the last 2 years. There were also many sustainability managers and directors of operations with embedded green skills.

The NGO representative highlighted the shortage of skills in carbon auditing and foot printing and noted that the building industry was lacking people with environmental or sustainability knowledge. BEAM training provided by the Hong Kong Green Building Council had resulted in hundreds more BEAM assessors than there were just a few years ago. Those working in restaurants or commercial buildings also required training in waste separation and recycling.

The engineering industry representative considered the key differentiator amongst engineering companies was how cost analysis tools were used for sustainability assessments for new infrastructure development. Within the representative's company, it had become standard practice to advise on sustainable strategies as part of the design process.

In terms of training, the representative emphasised the importance of such basics as understanding chemistry, water engineering and the treatment of wastewater and clean water. Existing training relied heavily on computer modelling with no understanding of fundamentals or basic principles, and there was a preference for in-house training. Although the representative suggested that graduates should have more knowledge and awareness of environmental issues, graduate architects and engineers did have a better understanding of these issues than they did in the past. The representative had experienced the need to adapt to green issues and sustainability, starting out as a water engineer, moving into environmental and sustainability consultancy and finally being concerned with the specific requirements of adaptation to a carbon-constrained future, all within the same company.

The textile industry representative emphasised the need for workers to be trained in the use of energy saving machinery to achieve optimal functional ability. Skills could still be applied in the textile technology even if the machinery was changing.

According to the representative, the textile industry required specialised pre-job training in addition to on-the-job training. The curricula of relevant courses did not incorporate green concepts. However, the representative emphasised the importance of reducing the use of energy and chemicals and recommended management courses that advise offices and factories of possible ways to reduce energy use. In future, there would be a need for people to oversee energy consumption in the office and in operations. In addition to vocational training, company guidelines needed to be developed to apply corporate responsibility to the environment.

The hospitality sector representative highlighted the importance of controlling wastage in food preparation to save costs. A good chef, in addition to cooking, needed to manage the kitchen, which included responsibility for food costs. General education was cited as the arena for promoting individual environmental awareness and responsibility.

The aesthetic therapy industry representative mentioned the importance of having a diploma, certificate or other qualification. 'Skills must be renewed at the same time', the representative said, describing a beautician's skills as a 'handicraft'. Vocational training should incorporate green and environmental concepts into the curriculum.

The PR representative stated that 'as telecommunications and computerised technology will dominate the whole world's development, PR practitioners need to improve their skills in communication networks and computerised know-how in future'.

The vast majority of respondents to the VTC survey considered it necessary or relevant to include trade-specific environmental study elements in the VTC's HD courses. Only one person disagreed. With regard to the suitable amount of trade-specific environmental content for any course, responses ranged from 5% to 30%. The respondents suggested that such content should cover such subjects as corporate and social responsibility for the environment, environmental management accounting and environmental management, policy and regulations.

Conclusion

What came across strongly in the interviews was that current efforts to reduce firms' carbon footprint are focused largely on energy reduction and waste minimisation, which may stem from a 'business-as-usual' approach that makes a few concessions to sustainability through the use of energy-saving technologies. There is little to be seen that is radical, with the arguable exception of the engineering sector in which designers, who are not specifically trained in environmental management, are actively designing buildings to maximise energy efficiency and using these designs as a selling point. The engineering industry

appears to have experienced a change in mindset. Ten years ago, environmental work was largely concerned with impact assessment to secure environmental permits for projects or to obtain planning permission, but sustainability is now considered a major factor in building and civil engineering design.

The transport industry appears to have strong potential for energy reduction, although investment in vehicles (planes, trains and buses) has locked operators into specific technologies for the lifespan of the vehicle, which, in the case of planes and trains, could be 20–40 years. The process of technological improvement therefore progresses over a longer time frame. Transport in Hong Kong, China is commercially oriented, and there is little incentive at the operational level to discourage travel as a means of carbon reduction. The government could force travel restrictions through the introduction of economic instruments, but doing so would most likely be deeply unpopular.

Commercial considerations were also the major concern for the service industry, in which stiff competition demands that firms provide what customers want. Change is likely only in response to government regulations or customer pressure. Minimising waste is the main means of carbon footprint reduction at present.

In terms of vocational training, it appears that very few employees enter the workforce with useful 'green skills'. In general, the businesses and other organisations surveyed provided in-house training or arrange external courses. There appears to be a lack of green skills provision through the current vocational training system, although in theory 5% of the content of vocational courses is supposed to relate to sustainability issues. This issue was not of particular concern to most of the interviewees, as there were few genuine 'green jobs' available, and green skills can be taught on the job with reference to particular business requirements. However, the NGO business advisor made the interesting comment that rather than consider which jobs will incorporate an element of sustainability and green skills in future, it would be better to consider which jobs will not.

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Chapter 18
Advancing Employability and Green Skills Development: Values Education in TVET, the Case of the People's Republic of China

Margarita Pavlova and Chun Lin Huang (Chandler)

Introduction

It has been widely recognised that development of employability skills is an essential component of TVET. For example, a survey of CEOs in Australia found that 33.1% of employers consider employability skills to be the most important factor for employing graduates (Australian Industry Group and Deloitte 2009). Similarly, the UK employers, when surveyed by the Qualification and Curriculum Authority, indicate that they value the key skills[1] (Turner 2002). It is true that the lists of employability skills varies across countries[2]; however, they are all related to general skills valued by employers and the ones that help individuals to gain employment and progress successfully through a working career.

The emergence of a green economy agenda within the framework of sustainable development makes additional demands on the composition of employability skills. A green economy requires development of generic green skills (among other skills) that are in demand in almost any occupation (Pavlova 2011). These generic green

[1] Communication, working with others, problem-solving, improving our own learning, application of numbers, information technology.

[2] Australian framework identifies eight main employability skills: communication, teamwork, problem-solving, initiative and enterprise, planning and organising, self-management, learning and technology (Australian Chamber of commerce and Industry and Business Council of Australia 2002).

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skills help to prepare the workforce to understand issues of green growth, to interpret environmental legislation and to increase energy and resource efficiency to enable the processes involved in greening the economy. Several generic green skills are presented below as candidates for the generic green skills list; however, research is required to shape the list more accurately (Pavlova 2011):

- Environmental awareness and attitude and willingness to learn about sustainable development, issues and challenges of SD.
- Coordination, management and business skills for holistic and interdisciplinary approaches incorporating economic, social and ecologic objectives.
- Entrepreneurial skills to seize the opportunities of low-carbon technologies.
- Innovation skills to identify opportunities and create new strategies to respond to green challenges.
- *STEM skills:* general understanding of the role of the science, technology, engineering and mathematics contribution to the process of greening economies and societies are currently missing from the lists.
- *Analytical thinking skills*: As business and industry move towards a genuinely sustainable model, it will require that the workforce at *all* levels is able to understand the thinking behind a closed-loop economy and how this differs from the traditional linear model of economic development.

Although, now, generic green skills are not considered as a part of employability skills, we argue that in the nearest future this will be the case as the greener economies require employees capable of meeting the demands of a 'green framework'. What should be the values that underpin these emerging employability skills that are 'green inclusive'?

This chapter examines the types of values that could underpin 'enriched' employability skills and discusses in some detailed experiences and practices in the People's Republic of China to illustrate a possible way of including values in TVET to address a green skills agenda.

Moral Values Are of the Key Importance

The importance of addressing values in education has been argued at the political level and supported through research. An international call to focus on values development in TVET was mentioned as early as 1999 in the Recommendations of the Second International Congress on Technical and Vocational Education. As the result of this development, more and more people working in the TVET sector, researching it or developing policies, realise the importance of addressing values through vocational education. For example, the participants of an international virtual conference on TVET and sustainable development[3] strongly supported the need to change the teaching paradigm for vocational education that is currently focussed on competency development to emphasise moral values through vocational training

[3] The conference attracted more than 100 participants from 50 countries from all UNESCO regions (Pavlova 2007).

(Pavlova 2007). They saw the danger in just preparing students for jobs and 'forgetting that the same person would have to interact with nature and people in other complex/dynamic aspects of living' (participant from UK).

Participants from developing countries also expressed the need to change the perception that vocational education is aimed at training technical skills only. They argued that students' behaviour must be developed through their vocational studies. A participant from India argued that 'More emphasis should be given on *developing attitudes and knowledge skills rather than technical skills*'. This call to change the educational paradigm of TVET brings it closer to general education that traditionally encompasses the development of values and attitudes as 'core business'. Another participant, who worked as a member of a non-government organisation in Nigeria, he was developing and implementing projects to help alleviate poverty and improve vocational education, highlighted the fact that after 3 years of work in the country, his team realised that there was a need to introduce ethics and character development into their courses (the module 'Be a Life model'). This participant stated:

> Suddenly we realised that even if we were able to give someone the best food, best clothing, best shelter, best academic/vocational education etc, unless we help him/her to also develop and abide by sound moral principles, we have not done much good for the person. (in Pavlova 2007)

This international community of practice was actively engaged in a 3-week online discussion on TVET and the kinds of education required for sustainable development. Participants shared their belief that an emphasis on ethics and moral values within TVET is equally important for all countries, especially within the framework of sustainable development that articulates many important values (Pavlova 2009).

The importance of values in TVET, although argued by many, has not been fully explored. What values need to be addressed in TVET? On the basis of literature (e.g. Albert 1968; Feather 1975; Kohlberg 1969; Parsons 1968; Rokeach 1968, 1973; Scheibe 1970; Schwartz 1992, 1994; Habermas 1974; Oser 1994; Gatto 1991; LeFay 2006; Parker et al. 1999), Pavlova (2009) argued that moral values should underpin the educational processes to help students to understand the need for and ability to be involved in the creation of a sustainable future.

Many definitions of values characterise them in terms of one's beliefs about the desirable. Rokeach (1973) emphasises that a value is a preference as well as a conception of the desirable. Preferences are choices that people make when confronted by a set of alternatives, where the alternatives involve a particular mode of conduct or end state of existence. The beliefs defining values may refer to modes of conduct (*instrumental* values) or to end states of existence (*terminal* values). According to Rokeach, *terminal values* include such concepts as a comfortable, exciting life; a sense of accomplishment; a world of beauty and equality; freedom and happiness; inner harmony; self-respect and social recognition; true friendship; and wisdom. They relate to the visions of what constitutes a desirable future.

Instrumental values encompass such concepts as ambitious, open-minded, capable, helpful, honest, imaginative, intellectual, logical, responsible and self-controlled.

Although most researchers acknowledge a functional relationship between instrumental and noninstrumental values, they see a conceptual advantage in this distinction. Values are not completely stable and they may change throughout life; however, they are stable enough to provide continuity to personal and social existence.

Through TVET programmes, both instrumental and terminal values could be addressed and the relative emphasis on one or another is deeply rooted in the context of each country. It is argued that in the current form, employability skills are related to the competence category of instrumental values. Rokeach (1973) distinguishes between two kinds of instrumental values (modes of conduct, means towards an end): those that have a *moral* focus and those related to *competence* or *self-actualisation*. According to Rokeach, moral values refer to those 'that have an *interpersonal focus* which, when violated, arouse pangs of conscience or feelings of guilt for wrongdoing' (p. 8). They refer mainly to modes of behaviour and 'do not necessarily include values that concern end states of existence' (p. 8). Competence or self-actualisation values refer to a *personal focus*, for behaving logically and intellectually. Although moral and competence kinds of values are both present in educational discourses in TVET, competence values are acknowledged more within the economic imperative of education that often underpins a rationale for TVET. Current employability skills are focusing on self-actualisation (or competence) although the addition of generic green skills would add a moral focus to them.

Within the framework of green economies and sustainable futures, moral values are becoming more and more important. Educators, philosophers and politicians are arguing for that. The 'remoralisation of human space' (Bauman 1995: 192) that led to many issues raised by the sustainability agenda requires an increase in 'moral capacity' (ibid). A large-scale international study by Campbell et al. (1992) concluded that the world needed to be changed to be more sustainable and at the centre of the new vision that are 'caring, just, morally responsible, compassionate and ecologically aware individuals who are committed to collaborative action in order to achieve desirable futures' (p. 38). Habermas (1974) contrasted rational values (effectiveness and economy) to moral values (commitment). He argues that rationality 'cannot itself be placed on the *same* level with all the other values' (p. 259) or prevail above them. Rationality and effectiveness (or such values as technical or economic) must be framed by moral considerations. Moral values relate to 'consideration for the welfare of others, or requirements of our duty' (Jarrett 1991: 14). They focus on 'obligation, the ought and ought-not, on duty and conscience and human virtues' (ibid, p. 14).

An important function value is to provide standards that guide behaviour in a particular way. For most people, values are ordered hierarchically in terms of their relative importance (Rokeach 1973; Schwartz 1992, 1994). Therefore, a moral aspect of values that relates to responsibility, duty and obligation towards humanity and nature needs to frame all learning in TVET and should be at the top of the

values hierarchy among teachers and students in the sector. Together with a *behaviour,* component values are underpinned by some *knowledge* about the means or ends considered by the person to be desirable and involve *affection* or feeling.

Through addressing moral values in TVET, students could make judgements about the type of practices they choose. Practices informed by moral values enable students to estimate positive and negative consequences of economic, social and technological developments that concern human beings immediately or in the future. To consider consequences of particular actions lies in the heart of appropriate teaching and learning in TVET.

Approaches towards moral education in TVET depend on the country's context. For example, in the People's Republic of China and the Russian Federation, values development through TVET have been rooted in socialist ideology where TVET was viewed as playing an important part in value formation compared to many other countries where TVET was oriented purely towards skills development. In both countries TVET curriculum includes general education. Classes such as history, language, geography and other general subjects provide an opportunity for the students to receive TVET qualifications together with general school certificate. After the revolution, the People's Republic of China followed the Russian Federation's example in linking moral with political education. Both countries had a commitment to an integrated personal and social morality through an emphasis on participation and character formation. Moral education was often used interchangeably with such other terms as political and ideological education. The coordinated impact on the individual through all educational institutions and media was aimed at development of specific values in TVET students.

Nowadays the situation has changed and interpretation of moral values is different. In the People's Republic of China, since 1978, a clear trend indicates a partial separation of moral education from politics with an increasing emphasis on personal moral qualities (Lee and Ho 2005) that are getting back to the earlier history, to Chinese traditional morals. In the Russian Federation after the collapse of the Soviet Union, all types of value-based education vanished which created a difficult situation for teachers. Study by Pavlova (2009) demonstrated that TVET teachers have been 'lost' as they did not have any guidance on what values to address (previously they used a framework of patriotism to develop students' values). People in the Russian Federation continue to believe that the state should take an active part in formulating values. The study by Kliucharev and Muckle (2005) demonstrates that 70% of respondents (2,500 participants) believe that it should be a state policy in the sphere of ethics and morality. In the recently published document, *The Concept of Spiritual-Moral Development and Upbringing of the Russian Citizen* (Daniluk et al. 2009), the aims for such education was formulated at the state level to underpin curriculum development and teaching practices.

Currently, in both countries the state continues to play an important role in identifying values to be addressed through education. The next sections explore the ways values are interpreted in the People's Republic of China and discuss how values development is addressed by one TVET institution.

How Values Are Interpreted in the People's Republic of China

Although the relationships between values education and political subjects are close, the core of value education in the country is deeply rooted in the ancient Chinese philosophy (except for the period of the inner chaos called 'great revolution' from 1966 to 1976). Confucianism has the most important impact on Chinese culture; its advocated values, attitudes and social relationships have influenced education development. *Lunyu* (the Analects of Confucius) a historical work by Confucius written more than 2,500 years ago explored and established the basic principles of Confucianism and Chinese traditional values. Throughout history many followers have interpreted these ideas that can be expressed by five Chinese characters: Ren, Yi, Li, Zhi and Xin (Dong, 179BC to 104 BC 1991). Although it is difficult to have an exact translation of these words, the approximation of the meanings is as follows: Benevolence, Justice, Etiquette, Wisdom and Honesty. These commands are formulated to guide peoples' behaviour. They also serve as the guidelines for the development of the harmonious society (Jiang, B. 2007):

- Ren (Benevolence) includes peace, love and tolerance. It describes the peaceful character of the nation. It advocates harmonious relationships between human and nature, a win-win situation among competitors. In the modern PRC it is accepted as a scientific concept of the country's development: holistic, harmonious and in accord with sustainability principles.
- Yi (Justice) – instead of the legal framework in ancient PRC, people thought, behaved and dealt with others in moral ways within the framework of justice. The patriarchal clan system in feudal society was underpinned by morals that were more powerful than any regulations. Although today's legal system (partly learnt from the west) represents justice, morals are not ignored in the People's Republic of China. They are linked to justice.
- Li (Etiquette) is an important component of Chinese culture. The original meaning of etiquette was related to the hierarchical structure of Chinese society: seniors and youngsters, gentry and pariah; everyone had a specific position in society. It was so-called 'father is father, king is king' type of relationships. Nowadays, etiquette has a new important meaning that highlights the need for respect among people. An individual's behaviour in society should be guided by shared social norms (common values)
- Zhi (Wisdom) represents respect to academic studies and learning (intelligence and wisdom are of value). There was a belief in ancient Chinese tradition that educated nobles should not do any craft labour but manage workers: 'Those labouring with brain are to be served, those toiling with brawn are to serve' (Meng, 372DC to 289DC 1984). Consequently craftsman skills were not valued and that has led to many dilemmas in TVET in modern PRC.
- Xin (Honesty) in ancient PRC was the basic credendum of people's behaviour. Children have been learning this from the early ages through children's stories.

These five values represent the depth of Chinese culture that has been reflected through different means including Chinese painting, poem, calligraphy, antique and pottery. Development of appreciation of those arts is considered as a powerful educational tool in developing the true spirit of Chinese traditional culture. In the People's Republic of China, elementary and secondary education have compulsory courses within these areas of art and at the tertiary level these courses are electives. If the terminal/instrumental value framework is applied, Chinese values such as Ren and Zhi could be considered as terminal, the end-state values of existence. Yi, Li and Xin could be interpreted as instrumental values that identify the particular mode of conduct or the means in achieving a desirable future.

Economic changes that transfer an agricultural society into an industrialised society and, later on, allow the economy to become a market-based society have been influencing the traditional value system of Chinese society. These economic changes that bring the benefits of industrial prosperity also bring along an individualisation, the establishment of 'jungle law' that characterised the earlier stages of capital accumulation. This process of 'development' caused many environmental and social problems such as pollution, distrustfulness, cheating, lower quality of products, maximisation of profit and unlimited greed (Wu 2004). Competition is considered as 'God's truth'. The saying 'father is father, king is the king' has no longer been applicable, but a 'winner is the king' became the contemporary slogan. Pirate and tinpot products are often the reality in modern PRC.

A number of strategies have been put forward by the state to resolve the above issues and the fundamental role of education has been fully recognised. The essence of Confucius philosophy is very close to the ideals of a sustainable society and a sustainable future. Therefore, looking back to Chinese traditional culture and values could be viewed as an effective way to foster students' development in that direction. Chinese society needs a change that is in accord with traditional values and this has been recognised more and more by the employers. When companies describe the list of skills required for a particular job, they put integrity, honesty, faithfulness and cooperativeness among the main qualities for any job (Jiang 2008). This demand places specific challenges to the TVET system asking it to integrate Chinese culture and values within the sector as employers in the People's Republic of China request it to develop a moral kind of instrumental values discussed in the previous section.

Case Study: Addressing Values in Zhejiang Technical Institute of Economics

TVET in the People's Republic of China

In the People's Republic of China, TVET constitutes an important component of the nation's educational agenda as well as an important avenue for promoting economic and social development and employment (The People's Congress of

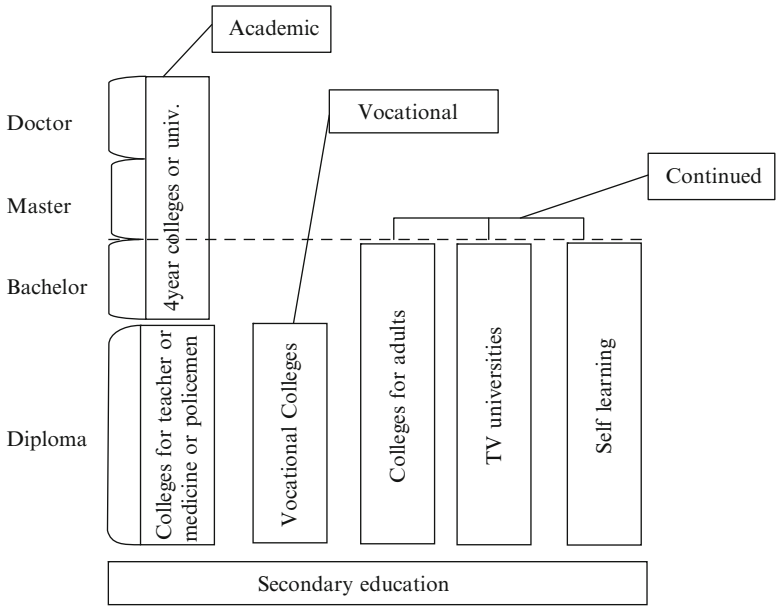

Fig. 18.1 Postsecondary TVET in the People's Republic of China

[the People's Republic of] China 1996). The system of vocational education consists of three levels: junior secondary (3 years), senior secondary (3–4 years) and tertiary (2–3 or 4 years). Junior vocational education starts after primary school education and is a part of the 9-year compulsory education. It is mainly meeting the needs of the less developed rural communities.

The senior secondary TVET is mainly delivered at the senior high school stage through specialised secondary schools (SSS), skill workers schools (SWS) and vocational high schools (VHS). Training is delivered by specialised departments in schools and colleges or through education departments of the companies. Teaching is mainly aimed at developing practical skills. By the end of 2011, there were 13,111 secondary vocational schools in the People's Republic of China.

The postsecondary education system in the People's Republic of China is very big and complex. Secondary school leavers can choose to enter 4-year university or college programmes through the college entrance examination (CEE) if they want to complete their academic education. Another pathway is to go to 3- or 2-year colleges to complete their TVET qualification. For adults, there are adult colleges which provide diploma teaching in a part-time mode. Self-directed learning examination and TV-based universities are popular ways to receive TVET qualifications, particularly for adults. Full-time universities and colleges have a large proportion of TVET students and they are major providers of TVET in the People's Republic of China.

Figure 18.1 shows the structure of postsecondary TVET. By the end of 2011, there were 1,280 tertiary TVET colleges in the People's Republic of China.

Vocational training is mainly conducted and managed by the public departments of Education and Labour at provincial levels, however, the involvement of the private sector is encouraged by the government.

Zhejiang Technical Institute of Economics

Zhejiang Technical Institute of Economics (ZJTIE) is a public TVET college under the leadership of the Department of Education of Zhejiang Province (DOEZJ), and the college is located in the Hangzhou Economic and Technological Development Area (HEDA), Xiasha, Hangzhou, covering an area of 384,000.26 m^2, and the building area is 219,800 m^2. It's library contains 667,600 books and accessible online resources. The worth of teaching equipment is valued at RMB30.1 million. Students' facilities are of a high standard. At present, there are nearly 7,500 full-time students and 5,500 part-time students. Over 400 full-time teachers (including over 90 professors and associate professors) and part-time teaching staff that include successful entrepreneurs from well-known enterprises and doctoral tutors from famous universities work at ZJTIE. The college is comprised of a Logistics Department, Economy Department, Business Management Department, Finance and Accounting Department, Economic Information Department, Automobile Application Department, Foundation Department, Humanity Science Department and Physical Education Department. There are 29 majors such as Logistics Management and Marketing. TVET training organised by the college serves the needs of Zhejiang province and the 'Yangtze River Delta'. Its programmes are guided by the principle 'Morality is the essence, Practice is the base' and focus on delivering a quality education through competency-based education and cooperation with the industry.

ZJTIE has been chosen for the case study as it is known in the People's Republic of China for its interpretation of and actions on integrating Chinese culture and TVET. In 2007, the State Ministry of Education presented it with the top award for achievements in campus cultural development. The college established a school-based approach for values development rooted in traditional Chinese culture that includes the establishment of a Chinese Poetry Teaching Center, National Poem Teaching and Culture, Academic and Ancient Chinese Arts Identification Center and ancient art appreciation activities. Although some aspects of ZJTIE experience are unique, it also shares some common approaches for values development in TVET in the People's Republic of China.

In the contemporary the People's Republic of China competency-based, job-oriented education focused on development of occupational knowledge, and skill does not bring enough competitive advantage for TVET graduates. Vocational colleges need to pay attention to the 'whole person development' including moral values and attitudes. Two widespread approaches applied by TVET institutions are the inclusion of political courses in the syllabus and/or the explanation of occupational ethics.

Moral and attitude education is commonly addressed in vocational institutions through the direct value education that is focused on 'scientific concepts of development' (referred above as Ren value). It describes development of the People's

Republic of China as holistic, harmonious and sustainable. For the personal moral development, 'Eight Do's and Eight Don'ts' has been advocated by the central government. They are related to all types of education including TVET (Ministry of Education 2006) and read as follows:

- Love; do not harm the motherland.
- Serve; do not disserve the people.
- Uphold science; do not be ignorant and unenlightened.
- Work hard; do not be lazy and hate work.
- Be united and help each other; do not gain benefits at the expense of others.
- Be honest and trustworthy, not profit mongering at the expense of your values.
- Be disciplined and law abiding instead of chaotic and lawless.
- Know plain living and hard struggle; do not wallow in luxuries and pleasures.[4]

These principles can be taught through incorporation in the courses such as moral education, language, history; inclusion in the text books; addressing them in class through different approaches such as broadcasting strategy, discussion, explanation; and engaging students in themed activities to deepen students' experiences and understanding.

Another common component of values education in TVET in the People's Republic of China is occupational attitude learning. These classes are specific to students' specialisations and their future occupations. They are usually conducted in the form of a classroom lecture by a teacher or a guest lecture by the employers' representatives or alumni followed by discussions, visits to the work place and discussions of occupational regulations. The occupational attitude learning is also reinforced through internships.

[4] In comparison the recently adapted values for Australian schooling (DEST 2005) constitutes of nine values. This presents a similar attempt from the government to deal with values in education (although in general education). The following values are identified:

- Care and compassion (care for self and others)
- Doing your best (seek to accomplish something worthy and admirable, try hard, pursue excellence)
- Fair go (pursue and protect the common good where all people are treated fairly for a just society)
- Freedom (enjoy all the rights and privileges of Australian citizenship free from unnecessary interference or control and stand up for the rights of others)
- Honesty and trustworthiness (be honest, sincere and seek the truth)
- Integrity (act in accordance with principles of moral and ethical conduct, ensure consistency between words and deeds)
- Respect (treat others with consideration and regard, respect other persons' point of view)
- Responsibility (be accountable for one's own actions... contribute to society and to civic life, take care of the environment)
- Understanding, tolerance and inclusion (be aware of others and their cultures; accept diversity within a democratic society).

Across these nine values, five can be classified as moral values: care and compassion, integrity, respect, responsibility and understanding, tolerance and inclusion.

In addition to these two components that are common to all TVET colleges in the People's Republic of China ('Eight Do's and Eight Don'ts' and occupational attitude learning), ZJTIE has introduced traditional culture education as an important additional component in students' development. This integration of Chinese culture and heritage into the TVET curriculum is a rare practice in vocational education, due to the assumption shared by many that vocational education should be oriented to skills training. The underlying belief for inclusion of Chinese culture and heritage in ZJTIE curriculum is the visibility of the strong links between skills and values, the whole person development and know-how innovations and the competitive market and 21st century requirements.

The ZJTIE's philosophy on inclusion of Chinese culture is also based on the understanding that there is a close link between the Chinese culture and contemporary society. However, it is acknowledged that selective approaches towards identifying the appropriate messages from cultural heritage need to be applied so they would not conflict with modern social and economic needs. As was stated above, the etiquette, for example, contained old hierarchical meanings; therefore, its meaning was updated to deliver the message that in modern PRC all people need to be treated with respect. Another example is the traditional academic orientation of Chinese culture and the ignorance of skill and working people. This issue is also being discussed with students to demonstrate the inappropriateness of this approach in a modern economy and society. The benefit of addressing challenges is that not only states rules such as 'Eight Do's and Eight Don'ts' are usually taught as a compulsory course but also an opportunity for the students to be actively engaged in learning is provided through the following cultural means:

- Calligraphy is a pure Chinese art that could not be associated with modern technology or be substituted by computer or typewriter. In the modern Chinese society of money worship, eagerness for quick success and instant benefit could occupy a person's mind. Calligraphy proposes an alternative of a peaceful and elegant enjoyment that can clear the mind and help a person to focus on work.
- Poetry seems to be forgotten by modern society, and particularly, it is not common for vocational colleges to advocate poetry learning. However, ZJTIE stimulates poetic emotion in students. The skill of reading and writing poems helps students in their professional and family life. It brings their communication skills onto the next level. Sublimate personality wins more appreciation.
- Chinese antiques are the essence of Chinese culture. In the delta of the Yangtze River and other wealthy areas, many businessmen enjoy collecting Chinese antiques as a hobby. Students learn to understand and appreciate Chinese antique, to distinguish between fake and original pieces. This additional knowledge is particularly important as it helps to develop integrity and honesty.
- Chinese drama, music and paintings are also beneficial for students as they bring an understanding of traditional heritage and contribute to the development of an all-rounded person.

These active engagements of students in a variety of activities help them to understand and experience the particular values, be proactive in understanding and organising activities and appreciate Chinese traditional heritage. There are a number of ways on how the above ideas are realised in practice:

Included in Specialised Courses

Occupation-specific courses constitute the major part of students' learning; therefore, Chinese heritage studies embedded in these courses could deliver significant results. Appropriate knowledge values addressed throughout these specialised courses could help students to relate their knowledge of future occupation with moral values. For example, Xin (honesty) is addressed in marketing courses, Li (etiquette) in hospitality and sustainable development (SD) in materials. In 2008 some elements of Chinese heritage studies were embedded in 20 specialised courses.

Delivered Through Compulsory Courses

Regularly, ZJTIE set up some compulsory courses (credit course) like the SD-based scientific concept of development, occupational attitude learning, calligraphy and painting in most majors. Students are learning concepts and skills in the classroom environment and beyond (e.g. site visits for occupational attitude learning). Students' active involvement in discussions and activities are encouraged.

Established as Elective Courses

The large number of optional courses (credit courses) like poetry and antique appreciation is listed as electives. For example, for the period 2004–2008, 58 elective courses have been developed and available for students. On average, one student had chosen 1.26 elective courses during a 3-year study at the institute. All students chose at least one elective course; 80% students chose more than one.

Facilities and Environment

The museum and antique appreciation lab was established in ZJTIE for students to enjoy. They are open for students every day and they are free of charge. An educational influence of the cultural environment could not be underestimated. Building walls and the campus are decorated with Chinese paintings and handwriting as well as Chinese statues. They are produced by students and teachers of the college.

Some teachers bring their own artefacts for the expositions. Matching the philosophy of 'education by environment', general staff of the institute is also involved in cultural activities organised on campus.

Students' Organisations

Students' associations hold rich and colourful activities to include Chinese culture into their leisure. The XINHUA poetry association, calligraphy association, fine arts association and literature association have been in operation since 2001. The XINHUA poetry association publishes its periodical called *Chinese Poetry Education* and distributes it in the region. More than 48 issues have been published.

Students are actively involved in many competitions. For example, in 2007 and 2008 in two local handwriting competitions for TVET and academic students, the participants from ZJTIE won both gold medals. These types of achievements develop students' confidence giving them an opportunity to feel good being TVET students.

Employability

As a result of the above activities and resources provided to students, the employability level of ZJTIE graduates is higher compared to other graduates. Since 2006 the employment rate has reached over 97%. In 2008 it was 98.6% compared to the average for the Zhejiang province of 93.2%. The graduates have been locally and nationally employed due to their developed personal qualities as well as proficiency in an occupation. General managers of all five sub-companies of the Zhejiang Material Industry Group (that has established close links with the college) are ZJTIE graduates. More than 30% of senior managers are ZJTIE alumni. In 2007 ZJTIE received an award for being among the 50 best colleges in the People's Republic of China for the highest employment rate of their graduates. The award was issued by the National TVET Association. The institution's experience attracts public attention. For example, on the 17th March 2009, ZJTIE president Chen Lineng gave an interview for the [People's Republic of] China Central Television station on the issues of employability. Survey demonstrates (Jiang 2008) that employers needed all-rounded, well-educated graduates, the ones that have potential and ability to be trained in the future.

This case study illustrates the way values could be addressed in the TVET sector in the Chinese context. The development of values included approaches through a combination of a compulsory 'Eight Do's and Eight Don'ts' that provides guidelines for values development in the occupational attitude learning and traditional cultural studies. This approach provides an opportunity to address both terminal and instrumental values, including moral values. This combination presents a systematic approach for values development in TVET. In terms of pedagogy, this approach includes both lecture-based and student-centred learning.

These practices help to address all aspects of values: knowledge, feelings and behaviour that increase employability of graduates and contribute to their successful career development.

Generic Green Skills

'Enriched' employability skills that include moral values and framed by 'green agenda' have been argued for in this chapter. The ways moral values are addressed in TVET in the People's Republic of China (as examined above) provide a mechanism to incorporate values associated with generic green skills in technical education and training. Those countries that have a tradition of values development through TVET (e.g. the People's Republic of China, Russian Federation) could achieve this effectively. The tradition of values education in TVET in the People's Republic of China (and in the Russian Federation due to historical links) encourages teachers to address values through generic subjects (e.g. ethics, literature, history, foreign language, biology) and specialised courses relevant to future occupations. In these countries, workshop teachers have been involved in the process of students' upbringing (values development); however, they require a definite framework and guidelines for that. Values that underpin a green economy could serve this need.

In the Russian Federation, for example, over the last half century, patriotism related to victory in the Second World War was the basis for value development. Now that the modern world has changed these, teachers are searching for a new vision that could serve as the basis for value development. As stated by the deputy director of the Methodological Centre for VET in St. Petersburg,[5]

> When you are talking to workshop teachers you realise that they have a deficit in new orientation. Too much [of value education] is built upon our victory in the Second World War (that relates to the age of teachers) which symbolise a fight between world evil and a victory over it. With the current generation it does not work so well as with the previous ones. (Pavlova 2009)

This deputy director discussed the possibilities of education for sustainable development as a framework for upbringing (value development) with workshop teachers, who stated that they would be very thankful if they have new ideas to build their upbringing strategies upon.

ZJTIE was actively involved in the project for addressing SD issues in curriculum with very positive results achieved, including content change and student-centred pedagogy developments. However, TVET teachers involved in the project felt challenged as they had limited knowledge of how to address SD issues through their teaching and they did not have enough reference material and syllabus examples (Pavlova and Huang 2009). Although there are challenges on the practical level of development and implementation of the SD in TVET, on the system level, that was possible.

[5] This centre develops teaching materials and resources for all VET institutions in the city as well as delivering in-service training for VET workshop teachers.

For the countries that do not have traditions of value development in TVET, the inclusion of green generic skills might involve more challenges. The conclusions of research conducted by Goldney et al. (2007) in Australia highlighted the difficulties of addressing sustainability issues in TVET due to the presence of 'a particular VET culture, pedagogy that prevents ESD development in VET'. The situation will be similar to the countries where TVET is exclusively oriented towards skills development.

Conclusion

Employability skills have been traditionally viewed within self-actualisation/competence framework. With an emerging green skills agenda within a sustainable development perspective, the inclusion of moral values in TVET is attracting more and more attention. The importance of moral values has been argued by both practitioners and researchers. Due to the different traditions in moral values inclusion in TVET, some countries such as the People's Republic of China and the Russian Federation have a historical advantage in generic green skills inclusion through TVET. The notion of developing students so they are capable of being involved in the creation of a better society and greener economy, by developing their responsibility and orientation towards the 'others', is closely related to the concept of sustainability that is concerned about humanity and its future, of the quality of life for further generations. It is suggested that a green agenda for sustainable development could provide such a framework for TVET. It could serve as the basis for policy formulation that identifies empowering strategies for students' development.

The reorientation of individual values towards green development empowers TVET graduates with new visions of reality and the means to achieve them. It is argued here that education for sustainable development and a green agenda are effective ways of addressing moral values through vocational education. However, context-specific thinking and planning is required for the development and implementation of these strategies and approaches accepted by TVET teachers and students.

This chapter examines an understanding of values in the People's Republic of China and the ways they are implemented by one TVET institution. The case study of ZJTIE demonstrates a variety of ways values are included in TVET and the results they provide in terms of graduate employability. All three components of values, cognitive, affective and behavioural, are taken into account through the courses and students' activities. The cognitive component provides the awareness of different values and demonstrates the reasons to put moral values first. The affective component establishes links between the practical task and students' feelings by putting activity into a meaningful context. The behavioural component gives students an opportunity to act in accordance with their moral values. Students receive help in developing their own value system so they can respond appropriately when they find themselves in a challenging situation.

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Chapter 19
Schooling's Contribution to a Sustainable Future in Asia: Can Schools Develop 'Green' Citizens?

Kerry J. Kennedy and Joseph Kui Foon Chow

Introduction

The role of schools in contributing to the development of foundation skills such as literacy and numeracy is well known. Yet schools also play a crucial role in preparing future citizens for the complex responsibilities of citizenship in modern democracies. Citizenship education may not be as well known as mathematics and language education, yet it is likely to be found as a component of the school curriculum in most countries. The form it takes varies since it may be a separate school subject, integrated as part of other subjects, a cross-curriculum theme or part of extracurricular activities (Schulz et al. 2010). It may also be optional or compulsory. The specific content of citizenship also varies. The International Civic and Citizenship Education Study (ICCS 2009), involving 38 countries, identified 12 topics that were common although the emphasis given varied from country to country: 'human rights, legal systems and courts, different cultural and ethnic groups, understanding parliamentary voting and elections, the economy and economics, voluntary groups resolving conflict, communications studies (e.g. the media), the global community and international organizations, regional institutions organizations and the environment' (Schulz et al. 2010: p. 51). Schools, therefore, can exert an influence on young

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people's engagement with environmental issues including the contribution they can make to the development of sustainable societies.

There is good reason to believe that schools take this mission seriously. Cogan and Derricott (2000), for example, developed a multidimensional model for citizenship education, one part of which was concerned to encourage students as 'stewards of the environment'. Dobson (2003) showed how a school subject such as English could be used to promote environmental awareness and understanding. Dobson and Bell (2005) promoted the concept of 'environmental citizenship' and showed that it had a particular relevance for school programmes that promote sustainability. Huckle (2008) argued the case for citizenship education to play an important role in promoting sustainable development. Hayward (2012) showed how even children in the primary years can be taught to both understand and act on sound principles related to environmental and social concerns. Finally, a project conducted by the European Commission showed that schools, especially through the development of special skills academies, can play a role in developing 'green skills' for a changing economy (ECORYS 2010). Schools were by no means the only agencies to do so, and firms and private training providers assumed a significant responsibility for on-the-job training for 'green skills' in the context of lifelong learning. Yet partnerships between the full range of providers were seen to be important to address a key issue for the future (ECORYS 2010: p. 6):

More and better skills are indispensable for the European labor force as they make it easier to innovate, adopt new technologies, attract investment, compete in new markets, and diversify the economy. This, in turn, increases productivity and so jobs and growth. For this opportunity be taken, the *European workforce needs access to environmental skills training*. For policy makers, it is important to understand which approaches to providing skills training are most appropriate and deliver the best benefits in terms of achieving sustainable development and providing good-quality jobs.

The study to be reported in this chapter investigated the role of schools in developing understanding of the environment as a key citizenship value that has the potential to influence not just attitudes but knowledge and actions as well. As shown above, the issue of sustainable development including the development of 'green skills' is too important to be left to chance. The issue is whether schools can be proactive in supporting students to become engaged in an agenda that has both personal and social relevance – an agenda related to the future of their societies.

The Study

Data for the study was drawn from ICCS 2009 (Schulz et al. 2010) in which 38 countries and 140,000 students were involved. The particular focus of the current study was on the participating Asian societies: the Republic of Korea; Taipei, China; Hong Kong, China; Indonesia; and Thailand. While these societies cannot be seen to represent the whole of Asia, they are spread across East Asia (Hong Kong, China; Taipei,China; the Republic of Korea) and Southeast Asia (Thailand and Indonesia) with variations in their respective human development indices

Table 19.1 Sample sizes for students, teachers and principals

Samples	Taipei,China	Hong Kong, China	Indonesia	Republic of Korea	Thailand
Students	500	500	500	500	500
Teachers	500	500	500	500	500
Principals	150	84	140	149	149

(very high to medium), gross domestic product (ranging from $1918 in Indonesia to $ 29,912 in Hong Kong, China) and experience with democracy (limited in Hong Kong, China, emerging in Indonesia, developing in the Republic of Korea and Taipei,China and often unstable but developing in Thailand).

Instruments

Students, teachers and principals answered survey questions using separate instruments specifically designed for each group. These instruments were originally developed in English but subsequently translated into local languages under the supervision of International Association for the Evaluation of Education Achievement (IEA) translation protocols (Schulz et al. 2011: pp. 52–57). Only selected questions will be analysed in this study, and these are reported below.

Sample

The sampling methodology followed in ICCS 2009 is described fully in Schulz et al. (2010: pp. 59–68). Student samples were drawn from grade 8 students between the ages of 13 and 14. The average age of the sample was 14.3 years (SD = .56) with student ages ranging from 14.2 in Taipei,China to 14.7 in the Republic of Korea. 49.9% of the sample were male and 50.1% were female. Sample sizes for each participating society are shown in Table 19.1.

Measures
Students

Environmental Knowledge and Skills

Questions related to environmental knowledge and skills were selected from the Civic Knowledge scale reported in Schulz et al. (2010) (five items).

Engagement in Environmental Activities

'Extent of student involvement in environmental organizations' and 'student participation in activities to protect the environment' (2 items)

Context

'Student perception of the respect shown by their country for the environment' (single item)

School

Teachers

'Teachers' participation in environmental organizations' (single item)
'Teachers' confidence in teaching about the environment' (single item)
'Teachers' perception of class room opportunities for participation in activities related to the community geared to local area' (single item)

Principal

'Principals' perception of school opportunities for participation in activities related to the community' (single item)

Data Analyses

'Environmental knowledge and skills' were reported as percentage correct for each question for each participating society. For the student and teacher survey, mean scores and standard deviations were computed for each participating society for the following five items: 'student involvement in environmental organizations', 'student participation in activities to protect the environment', 'student perception of the respect shown by their country for the environment', 'teachers' participation in environmental organizations' and 'teachers' confidence in teaching about the environment'. Two items – 'teachers providing students' environmental experiences' and 'principal's perception of schools providing opportunities of student participating in environmental activities' – were reported in percentage for each society.

The final section of the chapter provides conceptual analysis of issues that need to be considered for the future based on the baseline data analysed in the first part of the chapter.

Results

Environmental Knowledge and Skills

The five questions selected from the 79-item Civic Knowledge scale dealt specifically with environmental issues affecting societies and how these might be managed. As part of the international test, these are secure questions, so their specific content cannot be made public. In general, however, the items dealt with the impact of the environment, responsibility for the environmental, qualities for environmental leadership, community resources for dealing with environmental issues and conflicts of interest when dealing with members of the community on environmental issues. The correlation of these items with the total civic knowledge score ranged from .27 to.44 (Schulz et al. 2011: pp. 132), while the highest correlation among all 79 items is .49, suggesting a moderate relationship between these individual environment items and students' civic knowledge in general. In terms

of item difficulty, the item parameters ranged from −1.17 to −.35 (Schulz et al. 2011: pp. 144), suggesting these were not overly difficult items for students compared to other items on the scale. These measurements were computed using a calibration sample ($n = 500$) from each participating society, and different results might be obtained if item parameters were computed for individual societies. Nevertheless, the above provides a general picture of the content and psychometric properties of the items to be reported below.

Since the Civic Knowledge questions were distributed in multiple booklets, on average, each student had answered a portion of the questions (Schulz et al. 2010). In this study, only those students who responded to all five environmental questions were analysed, resulting in more than 500 cases analysed for each society to ensure adequate representativeness. Figure 19.1 shows the results of students' responses to the five questions in each participating society (the Republic of Korea; Taipei,China; Hong Kong, China; Indonesia; and Thailand). For ease of interpretation, it should be noted that Question 1 dealt with the impact of the environment, Question 2 dealt with responsibility for environmental action, Question 3 dealt with qualities for environmental leadership, Question 4 dealt with the use of community resources for understanding environmental issues and Question 6 dealt with conflicts of interest when dealing with members of the community on environmental issues.

The first point to note about these results is that there is considerable variation in students' responses. Individual questions attracted different levels of correct responses from different groups of students. Question 1, concerned with the impact of the environment, seems to have been a relatively easy question (around 80% correct responses) for students from all societies except those from Indonesia who recorded a very low level of correct responses (around 25%). Answers to Question 2, concerned with taking action on environmental issues, were more consistent across societies ranging from 46% to 63% correct responses, but this area of understanding was not as well understood as the previous one, with the exception of Indonesian students (56% correct compared to 24% on Question 1). Question 3, concerned with the qualities needed for environmental leadership, was well understood by students from East Asia (correct responses ranging from 80 to 90%) but less so by students from Thailand (61% correct responses) and Indonesia (51% correct responses). Question 4, concerned with the use of community resources to assist with understanding of environmental issues, was well understood by a large majority of students from Taipei,China and Hong Kong, China (81% and 88% of students, respectively), somewhat more moderately by students from the Republic of Korea and Thailand (around 70% for each) but less so by students from Indonesia (around 48% correct responses). Question 5, concerned with possible conflicts of interest when working with the community on environmental issues, seems to have been the least understood issue by most students with correct responses ranging from 52 to 61%. The exception to this statement was Indonesian whose students registered the highest number of correct responses (61%) on this area of understanding.

In addition to the regional variation in knowledge and understanding of environment described above, there was also variation within societies. Thus, Hong Kong, China did well on three questions (1, 3 and 4) with at least 80% correct in each case.

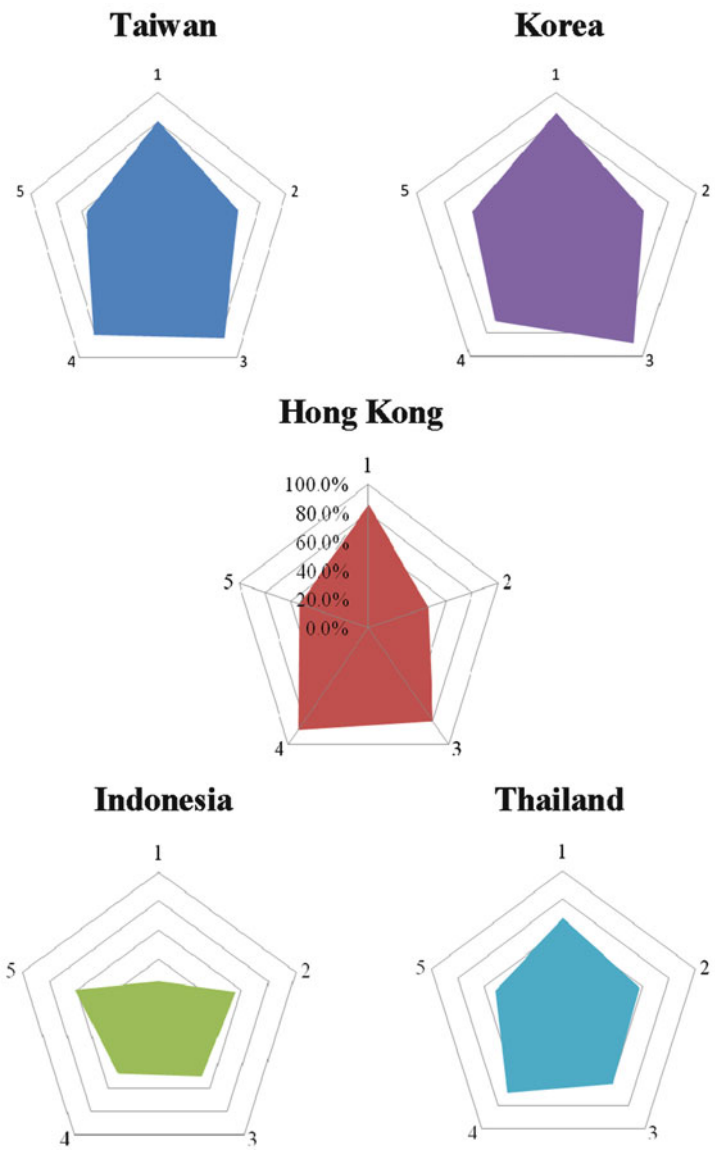

Fig. 19.1 Percentage of correct responses for Questions 1–5 in each participating society

Yet for Questions 2 and 5, only 50% of students scored correct responses. Indonesia represented the opposite case – it had close to the lowest number of correct responses for Questions 1–4 but the most correct responses for Question 5. Students from Taipei,China had relatively high levels of responses on most questions (over 80% correct on three questions and close to 60% correct on two questions), and students from the Republic of Korea showed a similar although not quite as strong a pattern of responses (over 85% correct responses on two questions and over 60%

on two questions) Thai students had moderate levels of correct responses across all questions (ranging from 51% to 67% across all questions).

These variations in students' environmental knowledge and skills, both within societies and across the region, indicate uneven patterns of student learning and uneven engagement with this area of the school curriculum. This issue will be taken up for further discussion later in the chapter.

Student Engagement in Environmental Activities

Table 19.2 indicates the extent to which students across the region are engaged in out-of-school environmental activities – specifically with environmental organizations and actions to protect the environment. Two trends are clear from these results. First, student engagement in environmental organizations across the region is relatively low with mean scores ranging from 1.07 (Republic of Korea) to 2.04 (Thailand). This indicates that the majority of students had in all likelihood never engaged in such organizations. The second trend, however, represents a somewhat different picture. When asked whether 'good citizens' should take action to protect the environment, the level of positive endorsement ranges from 3.27 to 3.68 out of 4, indicating that students across the region believed that taking environmental action is a relatively important attribute of a 'good citizen'. These results may not be contradictory.

Assessing current engagement in an environmental organization is a measure of the here and now – what students are actually doing. The 'good citizen' question measures an attribute of adult citizenship – from the point of view of students, it is a measure of what should be done. Thus while current student engagement in environmental organizations is low, there is little doubt that across the region, students view the environment as a key issue of citizenship concern and perhaps one in which they themselves will engage in the future.

Issues such as engagement in activities related to civic issues are often influenced by the context in which individuals find themselves. Thus students were asked whether they thought their respective governments showed a lot of respect for the environment. The responses showed marked differences across the region. For students in East Asia, there was a moderately positive level of endorsement of their governments' respect for the environment ranging from 2.30 (SD = .88) in the Republic of Korea to 2.78 (SD = .81) in Hong Kong, China and in Taipei,China 2.90 (SD = .86). In Southeast Asia, the responses were more positive with students in Indonesia registering an average score of 3.30 (SD = .69) and those in Thailand 3.31 (SD = .64). Given the analysis in the previous section, it is of interest to note that in those societies where student knowledge and skills seemed to be higher (Republic of Korea and Taipei,China), students indicated that their governments had relatively lower respect for the environment. The reverse is also true. In those societies where knowledge and skills scores were generally lower (Indonesia and Thailand), students indicated that their governments had a relatively higher respect for the environment. These results will be discussed later in this chapter.

Table 19.2 Comparison of students' responses to environmental-related items across five Asian societies

Item	Hong Kong, China			Taipei,China			Republic of Korea			Indonesia			Thailand		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Participation in environmental organization	479	1.34	0.591	494	1.11	0.364	497	1.07	0.306	484	1.88	0.868	495	2.04	0.782
Good citizen – protect environment	480	3.28	0.749	497	3.36	0.744	500	3.27	0.749	485	3.45	0.665	495	3.62	0.584
Agree – government respect for the environment	478	2.78	0.811	495	2.90	0.855	497	2.30	0.881	477	3.30	0.689	497	3.31	0.638

School Support for Promoting Concern for the Environment

Teachers play a fundamental role in developing students' knowledge and skills to the point where it is now generally accepted that the quality of teachers in a school system plays the deciding role in student learning (Hopkins 1999; Darling Hammond 2000; Rivkin et al. 2005). In what follows, various aspects of teacher engagement with issues concerning the environment will be reviewed).

The most positive attribute of teachers across the region was that they felt quite confident teaching about the environment. Teachers in Southeast Asia seemed somewhat more confident than their peers in East Asia with scores for both Indonesia and Thailand at 3.43 (SDs = 0.61 and 0.54, respectively) compared with Hong Kong, China, the Republic of Korea and Taipei,China where the respective scores were 3.01 (SD = .54), 3.4 (SD = 0.59) and 3.19 (SD = .073). This suggests that where the environment is part of the school citizenship education curriculum (as it is in the Republic of Korea, Taipei,China, Indonesia and Thailand., Schulz et al. 2010: p. 51), it will be well taught. It is interesting to note that Hong Kong, China reported that the environment did not form as part of the citizenship education curriculum (Schulz et al. 2010: p. 51) and its teachers registered the lowest level of confidence in teaching about it.

When it came to providing students with experiences about the environment that would focus on the local community, it seems that some teachers did this but it was by no means a universal practice, and there were different levels of endorsement in different parts of the region. The most positive responses came from teachers in Thailand where almost 93% of teachers said they focused on community activities followed by Indonesia with almost 76% providing such experiences. These positive responses were in stark contrast to the responses from teachers in East Asia. Only 17% of teachers in Taipei,China provided these experiences, 34% in Hong Kong, China and 57% in the Republic of Korea. These figures suggest that using the local community as a resource for helping students understand environmental issues varies considerably and is highly dependent on location.

Moving the focus outside of schools, teachers were asked about their participation in environmental organizations – just as the students had been. Just like the students, teachers across the region reported low levels of participation in such organizations. Ranging from 1.21 (SD = 0.51) in the Republic of Korea, 1.28 (SD = 0.50) in Taipei,China, 1.40 (SD = 0.71) in Indonesia and 1.60 (SD = 0.77) in Thailand. High levels of participation would have yield scores between 3 and 4. The pattern of participation in out-of-school activities – or lack of it – is uniform across the region. It seems that feeling confident teaching about the environment and using the community as a resource for environmental education may not necessarily be precursors for more active engagement in environmental issues that confront the community. It maybe that being a teacher and a community activist at the same time are not seen as compatible activities.

Teachers, students and classrooms are embedded within schools. To get some ideas of the importance of this context, principals were asked how many of their grade 8 students in the last year had been provided with activities that engaged them in local environmental activities. The responses were relatively positive across the

region with principals, indicating that at least 90% of students had been provided with some kind of activities that had engaged them in the local community. Yet there were differences in the opportunities provided in different parts of the region based on the emphasis placed on different response categories. For East Asian societies, the emphasis was on providing these opportunities for 'some' students – chosen by 64% of principals in the Republic of Korea, 61% in Hong Kong, China and 54% in Taipei,China. In Southeast Asia, the emphasis was on the categories 'nearly all' or 'most' students – 76% of principals in Thailand and 67% in Indonesia. Emphases such as these can be taken to represent the priority given to such activities, and it seems there may be different priorities in different parts of the region. This issue will be discussed later in the chapter.

Discussion

With reference to the sustainable school framework in the United Kingdom, Scott (2009: pp. 34–35) highlighted some key issues for schools in contributing to sustainability:

> A key component of the DCSF's (Department of Children, Schools and Families) approach is a focus on curriculum, community and campus which emphasizes that, whilst what schools try to teach is important, how the institution as a whole is led, how its resources are managed, and how it contributes to the communities it serves, are also key elements – as is how all these are pulled together so that students see, and are involved in addressing, the wider picture of sustainability. A positive feature of the sustainable schools framework is that it's been written in a way to help heads, teachers and governors understand recent policy focuses such as health, social integration, energy and transport.

The framework to which Scott refers provides a comprehensive statement about the breadth of the sustainability agenda that is seen to influence all aspects of a school's life. The focus is not just the classroom but the community and significant issues within the community. It is clearly a significant challenge for schools, and it is well to keep these broader issues in mind, for they suggest a quite particular orientation to schools and schooling, and it will be helpful in addressing the issues that have emerged from this study.

In this chapter, we have tried to explore just how well schools in selected Asian societies are contributing to the agenda outlined above. The Asian focus has been quite deliberate because it is in this part of the world that economic growth is proceeding apace and fuelling growth elsewhere. This economic dynamism has its positive side – especially in terms of its impact on lagging economies in other parts of the world. Yet unbridled growth that is not sustainable, growth that is not inclusive and growth that does not take account of any negative impact on the environment will not be in the best interests of the planet. Thus students as future citizens need to possess knowledge, values and skills that will enable them to negotiate the best solutions for a sustainable future. To what extent do the students surveyed as part of the study reported here appear to be capable of playing this important role?

Lack of knowledge and skills, more prevalent in Southeast Asia than East Asia, will be a fundamental issue for the future. As the quote from Scott (2009) above indicates, it is not just academic knowledge that is required – it is knowledge of the community and the world outside of schools. Yet this study found that both teachers and students had little experience with environmental organizations outside of school. It seems that education about the environment is largely school focused and maybe even classroom focused (although teachers and principals did indicate that they looked to the local community to engage students with environmental activities). Yet if the community is the focus of sustainability issues, then it also needs to become the focus of the school curriculum.

The unevenness of knowledge and skills across the region is problematic because the problems facing societies are common, for example, economic growth (or lack of it), social and economic exclusion of marginalized groups, including women and girls, old jobs disappearing and fewer newer ones replacing them and environmental degradation. Students need to be equipped to understand these issues as well as confront them. Based on the study reported here, students in the Asian region are on the right track but more will be required. Knowledge needs to be deeper and more widely spread, community engagement needs to be given a higher priority and real-world rather than academic issues need to become the focus of students' experiences.

These kinds of directions for reinforcing new knowledge and skills will be problematic in a part of the world where examinations play such a major role in school systems, where entrance to universities is limited and where competition remains at the heart of education systems. This may well be one reason why students from East Asia appeared to have less experience with community issues and environmental organizations – this takes time away from the study of the academic curriculum that is the focus of examinations. There is much talk about the 'overcrowded' curriculum – too much content to be covered and more and more expectations about what should be included. Traditionalists will also value what has always been part of the school curriculum, but the future demands that the curriculum be thought again to ensure that its content, values and skills focus not on the past but on the future – a sustainable future.

The role of parents, which was not included in the study reported here, must also be taken into consideration when the fundamental aims of the school curriculum are being considered. The examination 'culture' that is more evident in East Asia than Southeast Asia is fuelled by parental aspirations for the career advancement of their children. As Kennedy and Lee (2008) have shown, this culture is embedded in deep cultural values related to Confucianism and to the meritocratic ethic that underpins it. Examinations are the public policy instruments that keep this culture alive and that provide the pathway to limited university places. It is in this context that the traditional academic curriculum reflected in examinations is also supported by parents: it provides the pathway to a successful future for their children. Talking of a more relaxed approach to schooling, a more relevant approach to the curriculum and the removal of examination pressures will elicit negative responses from parents. Changing the school curriculum to align more with community needs is not an easy task. The difficulties are not just with

conservative educators but with community members in the form of parents who continue to look for meritocratic outcomes that can be delivered by an academic curriculum and a public examination system.

As for teachers, this study has shown that while they are confident teaching about the environment and using the environment as a resource, they may not themselves be good 'environmental citizens'. They teach it – they do not live it. There is some literature on this issue suggesting that in the area of citizenship education, teachers themselves need to be role models – they need to be 'active citizens' since this is exactly what they are encouraging students to be (Kennedy 2005, 2011). It is, of course, a big task for teachers who have so many varied responsibilities and for whom teaching about the environment is just a small part of these. Yet teachers are citizens as well – the responsibility for the future is as much theirs as it is students'. It does not seem unrealistic for them to engage in issues that are important to society and seek to influence them. It may not be part of their job description but even from the perspective of students 'it is what good citizens do'.

This study looked at two context variables – the country and the school that have considerable potential to influence students' attitudes. It seems axiomatic that if schools are to play a role in supporting the sustainability agenda, then governments themselves should be seen supporting a similar agenda. Based on the result of this study, students in Southeast Asia seem to have more faith in their governments on this issue than students from East Asia. Of course, these are simply student perceptions, so they may not reflect the realities but perceptions coming from somewhere; so it needs to be assumed that students are 'reading' their local political scenes in order to pick up these perceptions. At the very least, this means that governments need to do a better job communicating their policies and priorities for the sustainability agenda, but it also may mean that governments should take a deeper look at their policy priorities to ensure that they reflect future needs in this area. If students are to be good environmental citizens, then their governments need to be out the front leading on this issue.

On the issue of schools as contexts for encouraging environmental learning, the results of this study have been encouraging. Teachers appear to be confident teaching about the environment; there are links with community issues and students are gaining experiences in being exposed to these issues. In terms of school leadership, principals seem to be aware of the need to provide community-based learning opportunities for students. When all of this is put together, it suggests that a good foundation has been laid. The question is whether it is enough and whether more can be done. This raises important issues about the expectation of schools in Asian societies and the extent to which they might orient themselves to addressing key community issues relating to the environment and to sustainability. Addressing this issue takes us beyond the data provided in this study. Yet it seems important to do so in order to develop a picture of how schools in the region might move from where they are to where they need to be if they are to play a role in advancing the sustainability agenda. The next section of this chapter will address this issue in a preliminary way as means of demonstrating a possible future direction for schooling.

Sustainable Futures: A Role for Schooling

There is no shortage of literature on the kind of transformations needed to enable schools to meet the challenges of the future. They can be summarized under three broad headings: a whole-school approach to sustainability, a curriculum linked to the community and a new skills agenda. Each will be addressed in what follows.

A Whole-School Approach to Sustainability

'Environmental education' and 'sustainability education' are related constructs, but they are not the same. A more inclusive concept that embraces both is 'Education for Sustainable Development' [ESD] described by Gough (2005: p. 39) in the following way:

> ESD recognizes the importance of economic viability and productive employment at the community, regional, national, and international scales and provides students with the life skills they need to be constructive and active citizens, capable of and committed to contributing to a peaceful, abundant and sustainable future.

ESD brings together both the outcomes of schooling with the processes of schooling and is deliberately linked to citizenship preparation. This means that the citizenship curriculum can be enhanced by focusing on broader economic and social issues rather than narrowly constructed issues related to political institutions and political processes. Most importantly, community engagement can be factored into the curriculum so that citizenship issues are not just passive issues about voting, political parties and engagement with the media. Rather, they are about genuine civic engagement that is a much vaunted outcome for citizenship education. Sustainability issues such as those concerned with growth and development, poverty and social inclusion can be genuine areas of investigation for a citizenship curriculum underpinned by ESD. As Gough (2005) showed in the Australian context, some of these things are already happening, so it is something to which education systems in Asia can pay attention.

This expanded understanding of sustainability education does not have to be confined to what schools directly teach. Schools themselves can become sustainable communities. This can encompass everything from constructing 'green schools' as reported by Oetinger (2010) to People's Republic of China's *Green School Project* that focuses on 'whole-school environmental management and protection, EE [Environmental Education] curriculum and professional development, and greening of school grounds' (Henderson and Tilbury 2004: p. 13). That is to say, schools in their use of energy resources, their building materials, their daily operations and their values can reflect what it is they believe society itself ought to be.

A good example of the development of the idea of schools as sustainable communities is the *Hong Kong Green School Award Project* sponsored by the government, higher education institutions and the Hong Kong Productivity

Council. The purpose of the scheme is to 'encourage schools to formulate a school environmental policy and environmental management plan towards a green school; enhance environmental awareness, develop environmentally friendly attitude and promote green practices among school managers, teachers, non-teaching staff, students and their parents' (Environmental Campaign Committee 2012). This is not the only example of such an initiative as shown by Henderson and Tilbury (2004), but it has been chosen here because it demonstrates that within the region, work has already begun. It is work that needs to be accelerated so that schools might stand out in their communities as exemplars of what can be done if there is a commitment to a green agenda. Barton (2000) has discussed 'the potential for eco-communities', and there is no reason why schools should not play a leading role in these communities.

A Community-Oriented Curriculum?

Reference has already been made to the importance attached to examinations in Asia and their role in providing opportunities for advancement in meritocratic societies. The 'work hard ethic' induced in particular by Confucianism means that examinations are seen as the means by which families can gain advantage for their children irrespective of low income or other social disadvantage. Examinations are inevitably linked to a traditional academic curriculum – often one that streams students so that the focus is on preparation for university entrance even when the majority of students will not make it through the extremely competitive system that allocates places. Yet such a curriculum will not help create the kind of schools referred to above and will certainly not contribute to them.

A considerable reform is needed to reorient the school curriculum so that it can be more strongly linked to the community and its needs. The academic curriculum is linked to the past: old knowledge, old skills and old values. It is embedded in debates about forms of knowledge that were constructed largely in the 19th century as mass primary education was being pursued in most Western countries and when secondary education remained the preserve of the elite. The 21st century now provides access to higher education for larger and larger segments of the population, and lifelong learning means that schools provide a starting point in a learning journey but by no means the whole journey. The school curriculum can move forward to become more inclusive of multiple forms of knowledge, more oriented to issues rather than subject disciplines and more geared to the solution of world's real problems rather than textbook problems.

Yet such a reform requires leadership – it will not come of its own accord. Many governments in Asia have initiated education reforms as part of renewal for the 21st century (Kennedy and Lee 2008: pp. 24). Yet for the most part, these have not dealt with examination systems that remain entrenched in places like the Republic of Korea, Hong Kong, China, Taipei,China and Singapore. We have seen in the study reported here that education systems have started to embed issues related to the

environment in the school curriculum, but this aspect of the curriculum remains marginal while examinations hold such sway. Government leaders need to be bolder if schools are to contribute to the sustainability agenda. Curriculum reform needs to be more transformational and geared to engaging students as future citizens in major issues of the day – school graduates need to be problem solvers not just passive receptors of outdated knowledge. This agenda is a significant challenge for education policy makers, but it is one that will have to be met if sustainability is to be the core priority for the future.

New Skills for New Times

Linked to radical curriculum transformation is the issue of what kind of skills should be expected from school graduates? There is a current emphasis on so-called 21st century skills – problem solving, critical thinking, innovation, communication, team work, etc. Yet there are also reports of a different kind of '21st century skill' – often called 'green skills'. An initiative in Victoria, Australia, has enabled senior school students (years 10 and 11) to study for a Certificate in Carbon Management that would both provide them 'green skills' as well as contribute to their Australian Tertiary Admission Rank, thus giving a vocational subject the same status as an academic subject in the school curriculum (*Education Review* 2012). A number of nongovernmental organizations, also in Australia, have developed the 'igreen program' that supports students about to leave school in developing environmental assessment skills that they then must use on real assessments in the local community. It was also certificated training that gave students a credential they could use in seeking employment (Steplight 2011). These examples show that schools themselves can become the means by which students are trained to learn new skills that can help them with their careers but also contribute to sustainability in a very practical way. Such curriculum experiences are a long way from the traditional academic curriculum, but they go a long way towards integrating schools and the community. It is a direction that many education systems in Asia could well consider in the light of future needs related to sustainable futures.

Limitations

There were three main limitations to this study. First, it drew on secondary data for analysis, so there was no opportunity to ask new questions or interrogate different groups (e.g. parents). These two issues would be well addressed in future studies. Second, the analysis undertaken was descriptive rather than bivariate or multivariate. The reason was to try and establish some baseline information in a relatively unexplored area. Future research should look for relationships among the variables identified here and build explanatory models. Third, while societies from the Asian

region were the focus of this study, only five such societies were included on account of the secondary nature of the data that was available. To gain a broader picture of the sustainability issue across Asia, more societies could be included in future studies, especially those that may show greater variation than that shown in the current study.

Conclusion

This study has used both empirical and conceptual methods to show how schools currently contribute to the sustainability agenda and how they might continue to do so in the future. The results have shown that while environmental education appears to be part of the school curriculum for most students in the selected societies, its outcomes are uneven and the opportunities for students to engage with real-world environmental problems are also uneven across the region. It has been suggested that a more inclusive area of study such as Education for Sustainable Development (ESD) might be a more effective way of linking issues of sustainability with the school curriculum. In turn, this can be linked to citizenship education since sustainability should be a key value for students as they take on the responsibilities of citizenship on leaving school. To have the requisite knowledge and skills to do so seems an important outcome of schooling in the 21st century.

Finally, examples were provided towards the end of the chapter of some ways in which schools have incorporated 'green skills', as distinct from knowledge and values, as outcomes in the curriculum. While the examples provided are somewhat limited, they do show that there is a potential to value such skill development while not undermining other forms of knowledge and skills acquisition. There are important lessons here if schools are to shoulder more responsibility for the sustainability agenda and hopefully education systems will embrace these opportunities in the interests of a more highly skilled population and a more sustainable future for all.

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Appendix

Tables 19.2 and 19.3 show the descriptive statistics for each of the scales referred to above. There were four response categories for most questions (unless otherwise specified), with '4' representing the most positive endorsement and '1' representing the most negative endorsement. Tables 19.4 and 19.5 show the distribution of the responses in the questions reported.

Table 19.3 Comparison of teachers' responses to environmental-related items across five Asian societies

Item	Hong Kong, China			Taipei,China			Republic of Korea			Indonesia			Thailand		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Personal activities – environmental	491	1.44	0.611	495	1.28	0.503	492	1.21	0.508	493	1.40	0.705	492	1.60	0.766
Confidence in teaching about environment	102	3.01	0.554	90	3.19	0.733	83	3.04	0.594	69	3.43	0.606	53	3.43	0.537

Table 19.4 Comparison of teachers' participation in local environmental activities at school across five Asian societies

	Hong Kong, China		Taipei,China		Republic of Korea		Indonesia		Thailand	
Item	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Providing students environmental experiences	34.3%	65.7%	17.1%	82.9%	56.6%	43.4%	75.7%	24.3%	92.6%	7.4%

Table 19.5 Comparison of principals' responses to opportunities of student participating in environmental activities across five Asian societies

Item	*During the current, how many students in the school had opportunities to take part in environmental activities?*				
	All or nearly all (%)	Most of them (%)	Some of them (%)	None or hardly any (%)	Not offered at school (%)
Hong Kong, China	7.3	26.8	61.0	2.4	2.4
Indonesia	29.5	37.4	23.7	5.0	4.3
Republic of Korea	8.8	23.0	64.2	3.4	0.7
Thailand	22.8	43.6	30.9	2.7	0.0
Taipei,China	5.4	29.7	54.1	8.8	2.0

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Part IV
Going Forward: Possible Next Steps for a Skills Framework

Chapter 20
Skills for Inclusive and Sustainable Growth in Developing Asia and the Pacific

Shanti Jagannathan

The growing prominence of Asian economies and corporations, against the backdrop of globalization and technological progress, is leading to long-term changes in trade, business, and labor markets. Asia's economies have achieved remarkable growth rates. According to the ADB study *Asia 2050*: *Realizing the Asian Century*, if Asia continues to grow on its recent trajectory, it could account for 51% of world GDP by 2050 (compared with 27% in 2010) (ADB 2011).

Strengthening education and skills is an important policy lever for development. To quote, Ho Chi Minh said: To reap a return in 10 years, plant trees. To reap a return in 100, cultivate the people. Support to education is a key priority in enabling developing countries to become knowledge-based economies. Education and skills development are crucial to achieving inclusive growth and sustainable green growth. Governments are considering policy options to strengthen the human resource base required to serve the growth sectors of the economy, to avoid the "middle income trap," and to increase employment.

Jobs and skills are pressing challenges for developing countries. Paradoxically, there is also a growing concern of skills mismatch. How do skills training systems support skills acquisition and continued upgrading? How does the education system interface and interact with labor markets and industries to coordinate skills development with changing industry needs? What are good practices and lessons from different countries and regions that can better inform skills development policy making? In Manila, 12–13 December 2011, the event brought together diverse top-level professionals in government, the private sector, and academia. A range of issues on strengthening skills development systems and technical and vocational education and training (TVET) were discussed at the forum, particularly in the

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context of advancing inclusive growth and increasing employment. This brief has been prepared by drawing on papers presented and key messages discussed at the forum (http://www.adb.org/news/events/skills-inclusiveand-sustainable-growth-developing-asia-pacific).

Skills for Growth and Competitiveness

Jobs and Skills Are Pressing Development Challenges

Global unemployment stood at 200 million in 2011, almost half of that in Asia and the Pacific. In the People's Republic of China (PRC), 25 million people need to be employed in urban areas annually, while current annual job vacancies are only 12 million. India has a target of creating a pool of skilled workers of 500 million by 2022. Skills training systems are pressed to create "work-ready" people to increase employment. It is acknowledged that growth alone is not enough. More jobs and greater inclusiveness help to redress poverty, inequality, and exclusion.

However, skills development and TVET are only part of the strategy for employment, particularly for youth and vulnerable groups. Table 20.1 shows that the global youth unemployment rate in 2011 was 12.7%, compared with 4.6% for adults. An estimated 6.4 million young people dropped out of the world labor market in 2011. Countries with a youthful demographic profile need to consider strategies that would improve job prospects for young adults. Of India's current population, 47.8% is below 29 years, which will further increase to 49.9% in 2021. The mean age in Indonesia is less than 29.

A large share of employment in developing Asia is found in the informal sector. Improved skills increase prospects of better-quality jobs. Specialized strategies for skills training for small and medium enterprises would help their growth and increase employment prospects for workers in the informal sector. Skills training policies need to be augmented with labor market and social protection policies to redress the obstacles to workforce participation, increase employment, and reduce vulnerability of employment.

Addressing Skills Mismatch Calls for Not Just Upskilling but Also "Right Skilling"

Emerging and modernizing economies are very much concerned with upskilling their workforce to meet the demands of knowledge-intensive and high-technology industries. Asian technology has reached or is close to the global cutting edge in many areas such as electronics, computers, information technology, services, communications, pharmaceuticals, and biotechnology. Technology adoption in

Table 20.1 State of unemployment and employment in Asia

	2011 Adult unemployment rate (%)	2011 Youth unemployment rate (%)	2011 Adult labor force participation rate (%)	2011 Youth labor force participation rate (%)	2011 Share of vulnerable employment[a] (%)	2011 Share of employed poor[b] (%)
World	4.6	12.7	68.9	48.7	49.1	14.8
East Asia	3.2	8.8	76.5	60.2	48.7	7.8
Southeast Asia and the Pacific	2.7	13.4	76.0	52.3	61.6	11.1
South Asia	2.3	9.9	63.4	41.2	77.7	35.9

[a]Vulnerable employment: share of workers who are self-employed, employed in the informal sector, or unpaid family workers. Vulnerable jobs tend to be noncontractual and do not have social protection

[b]Employed poor: share of workers in employment earning less than $1.25 a day

Source: International Labour Organization (2012). *Global Employment Trends 2012*.

Asian countries has proceeded at a rapid pace, exerting pressure on the level of skills required in the workforce.

In the PRC, technological progress and industrial restructuring and upgrading are leading to a shortage of skilled workers. The PRC's National Medium- and Long-term Talent Development Plan (2010–2020) addresses vocational training and employment promotion. In the Philippines, a priority is to increase the number of qualified technicians at higher levels of national certification of the Technical Education and Skills Development Authority. The Council of Australian Governments has supported reform targets that include doubling the number of higher-level (diploma and advanced diploma) qualification completions by 2020. This is an exerting pressure to increase the number of people with higher educational qualifications.

However, recent trends point to the growing problem of skills mismatch with labor markets. The 2011 Manpower Global Talent Mismatch Survey points out that 41% of employers surveyed in Asia (compared with 28% in 2006) reported difficulty in filling positions due to the lack of suitable talent in their markets, compared with a global average of 31%. With a growing incidence of graduate unemployment in Asia's advanced and emerging economies, focus needs to shift to "right skilling" of the workforce.

Aligning Skills Training Policies with Economic and Industrial Policies

As Asian economies move away from low-cost labor advantages in manufacturing toward knowledge- and technology-intensive industries, the quality of the human resource base is crucial for competitive strength. An appropriate skills strategy is a key component of a successful economic and industrial policy. However, a number of countries, despite prioritizing skills development for economic growth, are yet to ensure adequate harmonization of skills and training policies with economic and industrial policies. The experience from countries like the Republic of Korea; Singapore; Hong Kong, China; and the People's Republic of China demonstrates a strong case for successfully integrating education and policies for skills development into nations' overriding frameworks for economic development. Countries need forward-looking skills policies so that appropriate occupational skills are available to fast-growing and emerging sectors of the economy as shown in Box 20.1.

Box 20.1 Leveraging Skills Training for Competitiveness

Common components of growth led by skills development	Examples of a skills training system that supports economic strength
Government and employers in strategic economic sectors are committed to skills development at all levels including high-level technology skills	Institutions, processes, and resources are effective at three levels:

(continued)

Box 20.1 (continued)

Skills strategies are supportive of the transition to higher-value-added products and services and priority sectors (e.g., plans for skills development in 20 high-growth sectors in India)	*Immediate*: matching skills to jobs and effectively connecting supply of skilled people to available jobs
The qualification framework supports development of competency-based skills and standards required by industry	*Medium term*: repairing talent mismatches in the economy through effectively shaping supply to meet demand-side forces
Labor market information and skills forecasting is available and used for skills and training	*Long term*: preparing a pipeline of skilled, semiskilled, and highly skilled workers aligned to the needs of priority sectors of economic and industrial importance, harmonized with investment, financing, and other policy provisions
A sustainable system of funding for higher-level skills development is available with flexible approaches to skills training delivery	

Source: Chenoy et al. (2011)

Ensuring Industry-Led Systems for Skills Training with a Conducive Regulatory Framework

There is widespread acknowledgment that the private sector is a critical partner for increasing cost efficiency, quality, and relevance in skills training. Although there is concern about the profit-driven nature of private provision, it is recognized that the private sector can also serve the poor and disadvantaged through voucher schemes and contracted training. Academy–industry partnerships, internships, and placement programs are mechanisms by which the matching of skills with jobs can be strengthened.

However, ensuring congruency of skills with the needs of employers through institution–industry partnerships is easier said than done effectively. On the one hand, a conducive regulatory environment is needed for private sector players to occupy a legitimate space for financing and providing skills training. On the other hand, several supportive measures are required to build a culture of partnership—for example, training institutions could be required to ensure employer representation on the governing boards and to establish employer advisory committees for each program so that updating and renewal of the curriculum reflect employer expectations. The private sector can also provide ancillary services such as supplies, publishing, and facilities management. Alternative funding mechanisms are needed to ensure that poorly performing public systems are not the only options available to the most disadvantaged.

Public funding to training institutions could be linked to accountability for performance, such as percentage of graduates employed and employer and employee satisfaction rates from training.

Industry support is required in the design and delivery of a responsive and diversified skills training program that focuses on applied learning. Industry participation is particularly crucial in the context of bodies such as sector skills councils to determine competencies and occupational standards needed in the workforce and to ensure that assessment and certification are acceptable to employers.

Box 20.2 Public–Private Partnerships in Skills Training: Example of India

The unique public–private partnership for skills development in India	Possible contributions from private sector
National Skill Development Corporation (51% private and 49% government stake; endowed with a corpus)	Supporting sector skills councils for assuring talent needed in industry
Objectives:	Setting up standards and quality assurance to ensure use of global best practices
Nurture development with long-term capital	
Improve returns by providing viability gap funding	Modernizing labor market information for accurate and real-time inputs
Viable skills ecosystem:	Supporting industry-relevant training
Support systems required for skills development	Demanding and absorbing "ready-to-work" and "certified" employees
Sector skills councils	Supporting internships and placements
Quality assurance mechanisms	Supporting employee cadres to act as trainers and assessors of competencies
Information systems	Promoting and rewarding lifelong learning
Train-the-trainer programs	
Skills standards and competency mapping	

Source: Chenoy (2011)

Supporting Qualification Frameworks and Quality Assurance

Qualification frameworks can strengthen links between education, training, and the labor market. They are means by which industry, government, and training institutions agree on standards for qualifications and learning outcomes. Qualification frameworks can also help to move the workforce toward meeting the economic goals of countries.

However, it is important to underscore their limitations, as they cannot by themselves make TVET more successful. While the introduction of a qualification framework usually has high levels of commitment from governments, it is more difficult to ensure continued arrangements for quality assurance, certification and accreditation systems, well-conceived learning pathways across different levels of education and training, and regular updating of standards and qualifications. By far the most crucial aspect of a qualification framework's effectiveness is to ensure adequate support from industry and employers. Countries need to consider establishing an appropriate "qualification corridor" that allows workers to move up the skills ladder over time. Industry and employers need to support government initiatives for qualification frameworks by giving preferential treatment to certified persons and favoring the hiring of only skilled people to promote the "skills ecosystem."

Strengthening the Skills and Workforce Development System

Increasing the Prestige of Skills Training and Rebranding TVET

Many education systems fragment and split vocational training from academic degrees with no bridge between the two. This often results in TVET being perceived as less prestigious than academic streams. Pathways from TVET to bachelor's and master's degrees are crucial so that students have options for moving from one stream to the other. A more integrated secondary, postsecondary, TVET, and higher education system enables acquisition of qualifications and certification in a flexible and nonhierarchical learning pathway. For higher-order and knowledge-intensive skills, interface with higher education is essential.

The qualifications obtained through TVET could merit reconsideration. TVET is associated with diplomas and certificates, whereas academic streams grant degrees with higher signaling value. In Canada, for example, the 150 colleges, institutes, polytechnics, and universities with a college mandate initially offered 2–3-year technician/technologist diploma programs. In response to demand in recent times, colleges now offer 4-year applied bachelor's degree programs and 1-year postgraduate certificates that target students seeking more practical skills to improve job prospects. Courses offering in Australia start from certificate level going all the way up to doctoral degree. Sri Lanka's qualification system recognizes competencies at different levels, starting from entry level to advanced level. Vocational/technological competencies at level 7 are equivalent to a bachelor's degree. A policy framework that blends skills training with higher education opportunities would help enhance the prestige of TVET and prevent it from being a dead-end learning pathway.

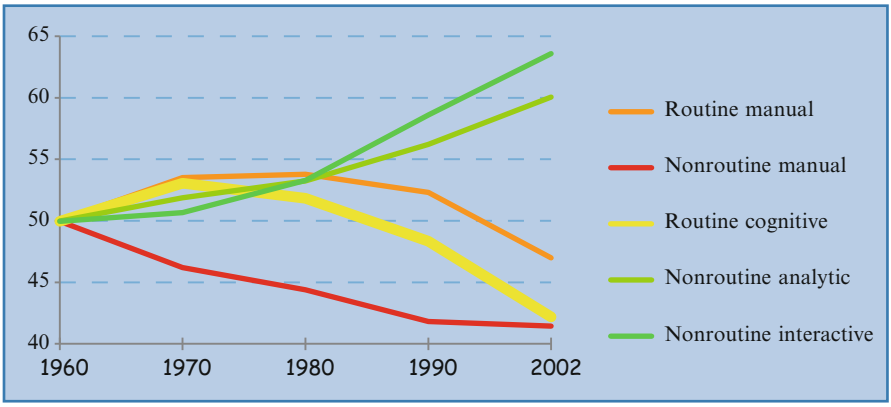

Fig. 20.1 Demand for skills (United States) (Source: Levy and Murnane 2005).

Strengthening Foundational Skills and Direct Measurement of Skills

As countries move up the value-added chain of production, employment shifts away from jobs involving routine cognitive and manual tasks toward jobs requiring tasks such as critical thinking and complex communication. However, measurement of skills largely focuses on proxies such as years of education or qualifications. More years of education do not necessarily mean higher skills. Qualification-based measures also ignore the fact that skills can be acquired informally and outside the education and training system through work experience. A recently developed instrument by the Organisation for Economic Co-operation and Development, the Programme for International Assessment of Adult Competencies, aims to provide internationally comparable direct assessment of foundational skills of the adult population (ages 16–65) in literacy, numeracy, and problem solving.

There is a growing demand for cognitive skills involving understanding, interpretation, analysis, and communication. Figure 20.1 shows a steep decline in the demand for routine cognitive skills and a sharp increase in the demand for nonroutine interactive skills. While skills training systems need a base of strong foundational skills, they also must adapt rapidly to changing market requirements. This has implications for the design of curriculum and its delivery, the type of courses on offer, and their regular renewal. While routine skills are easiest to teach and test, they are also the ones that are easiest to digitize, automate, and outsource.

Mainstreaming Soft Skills into TVET for Improved Productivity

The combination of foundational skills, soft skills, and technical skills contributes to successful performance in the workplace. Employers are increasingly stressing

the importance of soft skills to enhance effectiveness of technical skills. Attributes such as critical thinking, communication, collaboration, creativity, and problem solving enhance application of technical skills. Countries such as Canada are looking into mainstreaming soft skills into technical training programs. Soft skills or employability skills are sometimes considered even more important than technical skills for performance in the workplace.

The focus of skills training is often restricted to increasing enrollments without adequate attention to outcomes from training. Output per worker in developed economies and the European Union was $72,900 in 2011 versus an average of $13,600 in developing regions (International Labour Organization 2012). Despite increased productivity levels in Asia over the last decade, more attention to output per worker and higher productivity returns from skills training are needed. In addition to expanding access to opportunities for skills training to a large proportion of the population, outcomes from training need to be commensurate with the investments made. Skills utilization is just as valuable to productivity as skills acquisition.

Box 20.3 Examples of Employment Services

Australian employment services	Jobstreet.com, Philippines
Work placement with post-placement support and/or workplace mentors	Mediator/bridge between employee and employer
Intensive prevocational training targeted at basic technical and employability skills	Career Congress series bringing together 150 university representatives with 100 employers, government, and media
Workforce diversity and inclusion strategies for a supportive environment for the disadvantages	Sharing of best practices
Reverse marketing or "supply push" models to negotiate vacancies to suit specific job seekers	National Internship Movement
Job redesign for people with disabilities	Support to job seekers in critical thinking, communication skills, and other soft skills
Labour Market Information Portal website with a wide range of data for skills forecasting	

Source: Sinclair and Colet (2011)

Integrating Employment Services into Skills Training

The design and delivery of skills training have been undergoing rapid change. Traditional institution-based training delivery is giving way to multimode delivery mechanisms. Employment services such as career guidance and placement have become crucial to ease obstacles and constraints to workforce entry.

Advocacy and support systems for vulnerable groups to participate in labor markets is a valuable ancillary service demonstrated in countries such as Australia and Canada. Apprenticeships and internships are assuming even more prominent roles in strengthening the link between training institutions and employers. Apprenticeship schemes need to be redesigned and modernized so that they are not discredited as a source of cheap labor to employers. On-the-job training is also crucial for improved skills match. There is need to consider modular approaches to skills training and skills updating given the rapid pace of change and transformation in the market place. Lifelong learning and training are crucial for continued workforce participation.

Box 20.4 ADB Support for Strengthening Policies and Practices in Skills Development: An Emerging Framework

Issues for consideration	Possible policy levers	Possible benefits
Addressing the pressing challenges of jobs and skills for development in Asia	Skills policies linked with labor market and social protection policies Affirmative action to overcome obstacles to workforce participation	Increased training opportunities and improved employment prospects Reduced vulnerability and informality of employment
Addressing the paradox of skills mismatch with employer needs	Training courses based on an assessment of "right skills" required for the workforce, with a mix of high, medium, and basic skills levels. Incentives for skills development for high-technology industry employers	Reduced skills mismatches to jobs and reduced graduate unemployment A highly skilled workforce supports technology absorption and moving up the value chain
Leveraging skills training to improve competitiveness	Matching skills development priorities with economic and industrial priorities (e.g., skills, training for pillar industries in the PRC, skills development in the economic master plan of Indonesia, skills development for 20 high-growth industries in India)	Well-conceived and systematic skills training frameworks can support the overall economic growth aspirations and global competitiveness of nations
Ensuring industry-led systems for skills training	Conducive regulatory framework for the private sector. Employer representation on governing boards of training institutions and employer program	Availability of "work-ready" human resources and "certified" employees A responsive and diversified skills training system aligned to industry needs

(continued)

Box 20.4 (continued)

	advisory committees. Industry representation in sector skills councils and in accreditation of skills	and focused on applied learning
Ensuring recognition of skills training and certification but setting realistic expectations from national qualifications frameworks	Developing national qualification frameworks. Industry-led occupational standards and their use in training. Establishment of a "qualification corridor"	Certification, accreditation, and recognition of qualifications and training improve market orientation and confidence in learning outcomes
Increasing the prestige of skills training and rebranding TVET	Policy framework blending skills training with higher education. Introduction of associate degrees for TVET and applied bachelor's degree programs	Horizontal and vertical mobility in learning without dead ends Increased opportunities to upgrade skills and improve education qualifications
Strengthening foundational skills	Using tools for direct measurement of skills such as the Program for International Assessment of Adult Competencies in Asia. Strengthening nonroutine cognitive skills	Better assessment of actual skills Improve foundational skills that help advance skills development.
Mainstreaming soft skills into technical skills training systems	Incorporation of soft skills development, particularly critical thinking, communication, and collaboration, into training programs	Application of technical skills at the workplace is improved with good soft skills, and productivity is increased
Complementing skills training with employment services	Linking employment services such as career guidance, placement services, internships, and apprenticeship programs with training programs	Training leads to jobs; workforce participation is improved. There is better utilization of skills

Source: Compiled by Author

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Technical and Vocational Education and Training: Issues, Concerns and Prospects 19

Rupert Maclean · Shanti Jagannathan · Jouko Sarvi *Editors*

Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific

Focusing on the Asia-Pacific region, which in recent years has been the engine of global economic growth, this volume surveys trends and prospects in technical and vocational education and training (TVET) with particular reference to achieving inclusive growth and the greening of economies. Underlying the increasing pressure for new models of TVET provision is the rapid pace of technological change, demand for a work force which is highly responsive to evolving needs and a transforming market place that calls for higher order skills and lifelong learning. The book proposes a re-engineered, modernized TVET system that fosters an innovative approach which enhances the employability of workers as well as the sustainability of their livelihoods.

The book includes contributions from leading policy makers, researchers, and practitioners, including those in the private sector in analyzing and forecasting the most urgent priorities in skills development. The book argues for creative approaches to TVET design and delivery particularly with a view to improving job prospects, and meeting the goals of inclusion, sustainable development and social cohesion. Addressing issues such as the chronic mismatches between skills acquired and actual skills required in the work place, the volume proposes diversified approaches towards workforce development and partnerships with the private sector to improve the quality and relevance of skills development. The new imperatives created by 'greening' economies and responses required in skills development and training are addressed. Developing TVET is a high priority for governments in the Asia Pacific region as they seek to achieve long-term sustainable growth since the continued success of their economic destinies depend on it. The volume also includes an emerging framework for skills development for inclusive and sustainable growth in the Asia and Pacific region.

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