

# **Knowledge and Skill Development in Developing and Transitional Economies**

An analysis of World Bank/DfID Knowledge and Skills for the Modern Economy

Project

by

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## Executive Summary

### Overview

In April 2001, the UK Department of International Development (DFID) and the World Bank agreed to collaborate on a project titled “*Knowledge and Skills for the Modern Economy*”. The three-year research, analysis and dissemination activity was intended to provide the tools and knowledge for policy makers in developing countries to make informed policy choices for reforming post basic education and training systems to meet the challenges of lifelong learning. To further this goal, DFID committed approximately \$3.9 million to a trust fund that the World Bank agreed to manage and implement. Over its term, the trust fund has financed 17 studies tackling various issues related to lifelong learning, skills investment and development, education, networks, partnerships and technology. The studies represent a diverse range of projects and contexts covering an impressive array of topics, methodologies, and variations in data and analysis from most geographical regions of the world. This detailed macro-analysis of the various sub-projects concludes the overall project with a view to abstracting the critical knowledge and implications for improvement, sustainable policy, leadership, strategic planning and future action.

The main report begins by setting a framework for understanding the nature and challenges of knowledge economies, knowledge societies and lifelong learning goals that delineate the ultimate aspirations for knowledge and skills development. It then conducts two kinds of macro-analyses: the first through five clusters of projects that are grouped together in relations to shared concerns, and the second through significant emergent themes that cut across most or all of the 17 projects. Key summaries and recommendations for further research and

action are listed at the end of each chapter. The final two chapters then draw overall conclusions and recommendations and identify gaps that warrant further action or exploration.

### **Knowledge Economies and Societies**

Knowledge and Skills Development takes place within the context of a present reality and preferred future. The gaps in many developing countries between current reality and preferred future are enormous and the challenges for knowledge and skills development that will bring the future closer are therefore significant and substantial.

More and more developed nations are or aspire to be what are called *knowledge economies*. The knowledge economy is not just a synonym for information economy or information society. In an age of electronic, digital and satellite technologies, knowledge economies address how information and ideas are created, used, circulated and adapted at an accelerating speed in “knowledge-based communities,” i.e. networks of individuals striving to produce and circulate new knowledge. In knowledge economies, wealth, prosperity and economic development depend on people’s capacity to out-invent and outwit their competitors, to tune in to the desires and demands of the consumer market, and to change jobs or develop new skills as economic fluctuations and downturns require. In knowledge economies, these capacities are not just the property of individuals, but also of organizations, which have the capacity to share, create and apply new knowledge continuously over time in cultures of mutual learning and continuous innovation. Knowledge economy organizations develop these capacities by providing their members with extensive opportunities for lifelong upskilling and retraining; by breaking down barriers to learning and communication and getting people to work in overlapping, heterogeneous and flexible teams; by looking at problems and mistakes as

opportunities for learning more than occasions for blame; by involving everyone in the “big picture” of where the organization is going; and by developing the “social capital” of networks and relationships that provide people with extra support and further learning.

The knowledge economy is a learning society. Economic success and a culture of continuous innovation depend on the capacity of workers to keep learning themselves and from each other.

According to OECD, successful knowledge economies rely on four sources of innovation:

- scientific and technical knowledge
- interactions and incentives to innovate among users and doers
- decentralized modular patterns of innovation within a coordinated system
- widespread application of information and communication technologies, including in education

Knowledge economies work best when they are developed in conjunction with *knowledge societies*. Partly, this means recognizing and ensuring that knowledge economy initiatives do not only bolster existing or emerging elites, but also have spin-off benefits and yield social dividends for the broader civil society – through reductions in poverty, improved health, greater education and workforce participation for women and girls, and declines in levels of violence and criminality. The sometimes chaotic effects of fast-moving knowledge economies also need to be counterbalanced by creating conditions of security and stability in which investment can be conducted; by investing in the public sphere so it can work more effectively with private enterprise; by protecting universal access to, distribution of and long-

term storage of information that is a matter of public interest and investment; and by ensuring that the bonds of community, family life and indigenous culture are not eradicated by unrestrained economic progress.

There is a yawning gap between these preferred futures of knowledge economies and knowledge societies and the current realities of most developing countries, where industrialism, unemployment, subsistence living and vast informal economies define day to day life for most of the population.

One way to close the gap is through education and training. Improved access, universal basic education and foundation of literacy offer essential first steps on the path to becoming successful knowledge economies. But knowledge economies demand not just more education, but education and training that is also better and different. In the context of knowledge economy aspirations, the challenge of educational reform is therefore not just to *increase access* or even raise conventional tested achievement, but also to *change the nature* and *improve the quality* of learning, teaching and training so that they address knowledge economy objectives. How to do this when public resources are limited, poverty and unemployment are widespread, informal economies are extensive, inflexible bureaucracies are obstructive, and corruption is rife, is the fundamental challenge of knowledge and skills development.

In education and training development, we are moving from an age of access to a quest for quality. The very existence of this significant project suggests that the World Bank and DfID are on the cusp of making this substantial shift in investment and development strategy.

## **Lifelong Learning**

Knowledge economy learning is shared learning, continuous learning and lifelong learning. Rapidly changing knowledge economies depend and thrive on effective orientations to lifelong learning. Lifelong learning involves continuous upgrading and retraining but also much more than that in terms of continuous, personal and collective learning, growth and development.

Lifelong learning takes place in the formal, nonformal and informal economic sectors. In less developed countries, the informal sector is currently the largest and most significant. One of the greatest challenges of knowledge and skills development is to find ways to promote the transferability of learning and what is learned from the informal to the formal economy. Four issues in lifelong learning are central in less developed countries

- *Access and provision* that is flexible, affordable and available
- *Motivational patterns and incentives* that are established in positive attitudes to and experiences of learning in basic education, facilitated by tangible and transferable forms of qualification and recognition, and completed when skills learned are harmonized with economic opportunities to use them
- *Culture* that needs to be challenged when it impedes the lifelong learning opportunities of groups such as women and girls, and that should be worked with and capitalized on where indigenous lifelong learning skills are already strong.
- *Status and quality* of effective pedagogy and those who deliver it.

## **Project Findings**

The 17 Trust Fund project findings fall into five clusters.

- The demand for skills and the effects of investment climates
- Primary and secondary education reform and training

- Further and higher education and training
- Networks and partnerships
- Technology and innovation

The findings compellingly illustrate the challenges faced by developing and transitional nations as they use their limited resources to educate the many. The gap is clearly widening between those who are better educated (whether it be individuals, regions or countries) and those who are not. Progress in providing access to primary schooling contrasts with the challenge of improving results where there is little evidence of improvement in the quality of teaching and learning outcomes. Pathways that might help the under-educated acquire more training or gain access to the formal economy are not always evident or available. When training provision is increased, it tends to be taken up by those who have the benefits of prior training already. Also, while there are many initiatives to introduce technological hardware and software into schools, few provide support in ways that are pedagogically effective.

Despite these challenges, the projects also point to a number of examples of innovative and promising practice. By working across sectors and disciplines, a number of workers and learners are achieving significant progress in ways that provide clues and directions for policy development and for the strategic directions that governments might choose to follow. In Peru, for example, public universities have worked with private industry and overseas technological innovation to develop and sustain a cutting edge and highly successful asparagus industry that has built itself on the indigenous agricultural knowledge that is already present in the culture. In Chile, public universities and NGO'S have partnered with private and public educational institutions and used collaborative, representative, and local decision-making teams, to bring about effective uses of technology in schools. In many countries, multi-national corporations are

beginning to exercise greater corporate social responsibility as they engage with communities to improve services, the environment, and the education of local workers. And in Namibia, current data on local markets and market saturation have been compiled in a low-cost way to help inform choices about and provisions of just-in-time training courses that are fitted to immediate local needs. Examples such as these have arisen in all five clusters of projects which we now summarize in turn:

### ***1. The Demand for Skills and the Effects of Investment Climates***

There is a huge demand for a more educated workforce in less developed and transitional economies. Yet in regions like the Middle East and North Africa, while demand is shifting towards more educated workers, most of the labor force remains in agriculture, family enterprises, or the informal economy. The resulting low levels of skill limit how well technological innovation that has been introduced through trade and Foreign Direct Investment, can be transferred into the local economy. While one solution might be a virtuous spiral of skill upgrading and technology transfer, where technological innovation increases the demand for skilled workers, and raised educational attainment, countries with very low skill levels are often unable to attract initial investment and can find it hard to adapt technologies that have been developed for high skill “leader” countries. The spirals can also be selective and inequitable, providing more training for those who have already received training previously, and improving productivity only at the cost of employee equity.

How well a country is able to respond to the training needs of its people and its economy is dependent on social, political and other factors that make up its investment climate. Once regarded as uncontrollable “externalities” to economic behavior, investment climates such as corruption, financing, tax administration, regulations and policy uncertainty clearly influence the

performance of firms; they explain much of the variation among countries in their experiences of and orientations towards economic and educational development; and they are therefore legitimate and necessary targets for donor attention and policy intervention.

One significant aspect of the policy environment and investment climate is the emphasis given to public versus private training. Yet each makes a contribution. While the private sector has had considerable success in providing appropriate training in urban areas to larger businesses with specific needs, the public sector addresses broader education content and often offers better support in isolated or rural areas. Although training benefits are greatest where the investment climates are strong this is more the case where companies are large, relatively new, export orientated, and/or foreign owned.

The implication is that both public and private training merit expansion, attention and increasing interconnection in an overall strategy which recognizes that one-size does not fit all and that local responsiveness is essential.

*One promising practice is in Namibia where modest and prudent donor support has helped local training centers collect data about local consumer demand and about market saturation points for skills, so this can inform and guide discussions about training courses and provision on a just-in-time, one or two year basis, as fluctuating local conditions demand.*

## **2. Primary and Secondary Education, Training and Reform and Teacher Training**

The spine of any educational system is the quality and reach of its basic and secondary sectors, along with the education of its teachers. All further and subsequent lifelong learning is supported by this. Access to primary schooling or basic education has improved greatly across the regions during the past decade, with most countries now educating about 95% of their populations. Yet these promising figures disguise considerable repetition of grade levels and high drop-out rates leading to young people having poor levels of basic skills when they enter the labor force. These patterns continue at the secondary level, where, despite improved access,

drop-out rates remain high and achievement levels are largely stagnant. Access does not always or even usually translate into achievement. For success to occur, policy needs to promote greater quality and higher standards in learning, teaching and teacher education.

It is enticingly easy and inexpensive to address this problem by developing standards frameworks of knowledge economy competencies to which teachers should adhere and aspire. But these frameworks have little value unless teachers have developed the capacity to meet the standards in question.

In many developed and developing countries, qualified secondary school teachers tend to be the hardest segment for the teaching profession to attract, the most expensive to educate and the most difficult to retain in school, especially among male teachers and those in high-demand areas, such as mathematics, science and technology.

Secondary school teachers who remain in the system lack *confidence* and *competence* due to the erosion of their traditional subject-based authority as they face greater number of more challenging and changing students in a mass rather than elite system. Although there is remarkable convergence among interviewed stakeholders as to knowledge-society competencies that teachers should acquire and display in the classroom, teacher education programs still place most stress on *content knowledge* rather than *knowledge of teaching and learning* and of *how to teach one's subject*.

Secondary teacher training is poorly equipped to address these problems. Teacher education reform therefore needs to move beyond listing the competencies that comprise and create quality learning, to articulating teacher education across a continuum of lifelong learning over time, and integrating it with school development, leadership development and strategies of

systemic reform – with teachers working and learning together more in schools that are stronger professional learning communities of quality and improvement.

*Vietnam's teacher education reform is moving in a knowledge economy direction. While there are only a few outliers of promising practice on the ground, at this point, increased access plus improved quality are clear priorities of the system, well embedded in the discourse, and amenable to a young teaching force that is open to improvement.*

Educational quality and improved teacher education will not be achieved in developing countries without intelligent, effective and orchestrated reform efforts. It is difficult for countries to learn about the effectiveness of their reform efforts without evidence of improvement or its lack in their own system and in relation to comparable systems elsewhere. Yet many countries with developing and even transitional economies have limited data about their students' achievement or their systems' effectiveness. They also have limited competence and capacity to collect, organize and interpret such data in ways that can usefully guide policy or practice.

The Knowledge and Skills Trust fund has been able to support courses for policy-makers on interpreting reform alternatives and on administrating and analyzing national education assessments, but these assessments provide only limited leverage for improvement unless they are relevant to and useful in the specific countries where the data are collected.

Further educational reform progress in developing countries might be advanced by

- increasing awareness of not only the *content* of different reform alternatives but also of *change processes* for implementing them and developing teacher capacity to do so.
- facilitating national assessment comparisons not with the highest performing countries, but with those that are economically and politically similar and also perform better (requiring improved typologies of countries to make this possible).

- developing data management, not just as summative systems of *assessment of learning* that has been completed, but also in local systems of *assessment for learning* that provide real-time feedback on student learning that can guide local improvement

### **3. *Further and Higher Education***

Beyond and sometimes beside conventional secondary education is the training and education that most directly abuts the world of employment and the economy: technical and vocational education and training, and tertiary education. Some of the most obvious connections between lifelong learning and knowledge economy are to be found in the provision of technical and vocational education and training (TVET).

Trust Fund studies of TVET found that quality and quantity is lacking in most developing countries and in many transitional economies. Much of this is due to the pervasively low status of TVET but there are a range of other formidable problems too. Pedagogies are conservative, content is often traditional, and assessment procedures are summative rather than formative - all out of step with knowledge economy needs. Too much effort has to be devoted to remediating problems of basic literacy that have not been dealt with adequately in the earlier stages of education. Public systems for delivering training tend to be over-centralized, inflexible, supply driven, and not sufficiently accountable. Pathways between general, vocational, tertiary education and the workplace, where further training opens doors between informal and formal economies, are generally insufficient, underdeveloped and unclear.

Yet, there are exceptions to these patterns. In Africa, for example, despite widespread unemployment, and the proliferation of HIV/Aids, there are considerable strengths, achievements and opportunities on which TVET reforms can be built. For instance, African enterprises provide a substantial amount of formal and informal training along similar lines to

that found in middle-income and developed countries. New governance arrangements and the establishment of national coordinating bodies and training authorities have also often given stakeholders authority to develop training markets and allocate resources.

Training challenges are greatest within the vast informal economy, where smaller enterprises train less frequently, or use only traditional apprenticeships that perpetuate conventional technologies and that lack standards or quality assurance. Training for the informal sector necessarily has to be flexible in its delivery. For those who undergo it, it also needs to have an immediate application if it is to justify their investment. Because full cost recovery is rarely achieved in the short-term, public sector and NGO investment seems to be most effective in this case.

Worthwhile future directions for TVET reform include improving the quality of public training by making it more flexible and responsive to changing markets; building on the existing capacity of a broad network of non-government training institutions and enterprises that include NGOs, religious-based providers, and for-profit trainers; targeting niche markets in small enterprises with good growth prospects in locally developed models of intervention; developing multiple pathways between systems and levels to improve flexibility and responsiveness; and improving quality and quality assurance by devising incentives to attract, retain and develop high caliber staff in higher status systems.

Beyond secondary education, the tertiary sector in all countries offers even scarcer access to educational opportunities. Yet it is here that the highest levels of contribution to the knowledge economy can obviously be made – in a sector that continuously creates and produces new knowledge. The Trust Fund projects identified and found considerable variation among seven Central and Eastern European countries in tertiary education. In these new European

economies, which are also post-Soviet societies, the expansion of tertiary education provision in the last fifteen years has not changed its basic character or quality in terms of teaching methods, quality of learning or acquisition of skills. Public universities and other training institutions run the risk of becoming irrelevant to a rapidly changing economy, private institutions are prone to reductions in quality and both sectors run the risk of declining accountability.

There are important exceptions, though. In Romania, which has moved quickly to becoming a market economy and democracy, reforms have concentrated on eliminating obsolete course content, on building a coherent legal framework to ensure more effective coordination, on initiating more flexible study programs, on developing national standards for institutional accreditation, on adapting a transferable credit system, on developing quality indicators, and on allocating disproportionately greater funding to the most dynamic and effective higher education institutions. Similarly, Latvia has significantly expanded higher education provision and take-up, both regionally and through a new private sector, as well as introducing a quality assurance system, instituting a system of student loans, and upgrading as well as developing new study programs. The Trust Fund project reports provide no guidance on how these directions and developments might be transferable to tertiary education systems in Africa or Latin America, for instance. The Trust Fund projects also examined career guidance systems within and beyond further and tertiary education. These programs, it was shown, can improve the relationship between skill supply and demand in knowledge economies and can also increase access to education and training for the disadvantaged and the poor. Such systems are most effective when they are coherently administered, provided by a range of institutions, sequenced according to ascending priorities, and guided by an ongoing evidence base of access and impact.

#### *4. Networks and Partnerships*

Knowledge societies are network societies. In network societies, increased communication and travel mean that migrants who seek better economic opportunities abroad need not sever their ties to or communications with families and friends in their homeland. Network societies also encourage greater knowledge sharing among partners with a mutual interest in increased prosperity – fostering increased collaboration above and beyond the public/private divide.

Diaspora networks are globally distributed populations that are connected by common faith, ethnicity, or national identity, and that activate and renew these connections by networking locally, globally and back to their homeland. They provide one powerful means for developing economies to access knowledge, skills and investment from elsewhere. While talented students in developing countries still migrate to continue their studies and work in the advanced economies, when they became entrepreneurs or managers of multinational firms, they then often use their own global networks, and especially those of their Diasporas, to reinvest in and help build new establishments in their home countries. At their best, these emerging migration ladders comprise a virtuous cycle of co-development of both migrant human capital and home country institutions. In particular, expatriate networks can help to identify and surmount obstacles to reinvestment, and can access the relevant technical knowledge in other countries that will assist the home country. More research on who connects with whom in diaspora networks and on what ways are most beneficial for improving understanding about how to support them more effectively through methodologies such as social network analysis could be especially helpful in this regard.

*In 1997, Ramón L. García, a Chilean applied geneticist and biotechnology entrepreneur with a Ph.D. from Iowa State University contacted Fundación Chile.*

*to help provide the technical infrastructure that would allow Chilean agribusiness to develop domestically viable variants of crops typical of California's Central Valley. After jointly reviewing their portfolios of initiatives, Garcia's company and the Fundación founded a new, co-owned company to undertake long term R&D projects needed to transfer technologies to Chile that were key to the continuing competitiveness of its rapidly growing agribusiness sector. Without Garcia's combination of continuing, deep knowledge of Chile, advanced US (i.e. developed country) education, exposure to US managerial practice and experience as an entrepreneur, establishment of the new company would not have been possible. This company has successfully developed a technological platform for applying modern biotechnology to the improvement of grapes and stone fruits: two key export crops that are very important to the Chilean economy. This diasporas network did not simply bridge existing Chilean capacities with new opportunities, but actually developed new and stronger capacities.*

In addition to diasporas, knowledge exchange, transfer and creation benefit when people build, develop and participate in institutional partnerships. In knowledge economies, some of the most interesting and promising partnerships span the public/private sector. Several examples of successful and sophisticated cross-institutional partnerships were spread across the Trust Fund project studies, demonstrating the value of supporting effective lifelong learning by connecting indigenous skills and knowledge to solid public education and advanced university research capacity as well as to technological development and skills along with economic investment from overseas.

*The asparagus industry in Peru has been built on a well-developed formal educational base, at the core of which is a public agricultural university, the Universidad Nacional de la Molina, in Lima, where most of the entrepreneurs in the asparagus industry were trained. These entrepreneurs, in turn, learned new techniques in asparagus growing and processing from U.S. (green) and Spanish (white) asparagus growers. Peruvian entrepreneurs were brought to the U.S. by USAID to learn these new techniques. Spanish investors, on the other hand, came to Peru to take advantage of lower wages. In both cases, technology transfer took place and was adapted to Peruvian conditions. Further, Peruvian entrepreneurs learned (and continue to learn) advanced techniques of irrigated desert agriculture by taking courses in Israel. Peru's asparagus producers are organized into an association that disseminates information and assists with marketing. In addition, the university at La Molina produces research on new export crops as well as pest and disease control, that is made available to asparagus producers, constantly adapted to local conditions, and taught by larger*

*growers to technicians and small farmers. All this lifelong learning has high payoffs for economic development.*

*This case exemplifies the value of treating the public and private sectors not as opponents but as allies, working together to support lifelong learning and training that promotes the greater economic and social good, and that is deserving of complementary rather than competitive investment.*

While public institutions work more closely with private organizations to promote effective lifelong learning and training associated with economic development, private businesses and organizations can in turn contribute to social projects that benefit the public good and improve the investment climate of security and stability in which economic development occurs. One of the key trends in this second sort of public/private partnership is the movement towards greater corporate social responsibility (CSR).

Most CSR efforts have focused on issues such as monitoring working conditions in global supply chains, ensuring environmental sustainability, and improving quality of life in communities that are heavily dependent on single industries such as mining. The collapse of Enron and other high profile corporations that put profits before principles has amplified the receptivity to CSR initiatives.

One of the papers in the Trust Fund projects itemizes a key set of characteristics that characterize good CSR practices. They include having a grasp of specific and strategic capabilities for transferring know-how to host countries, where they build human capacity for sustainable economic development; trying to address the population's need for core business competencies while also meeting strategic social goals; – demonstrating a capacity for building effective partnerships and collaborations with the public and social sector; being able to stimulate innovation simultaneously in the business and social worlds; and doing all this in a sustained way, over time, through building greater capacity at the local level.

*One of Unilever's soap factories in Indonesia, treats water from the nearby river to manufacture soap, toothpaste and shampoo – since they all require clean water. It is in Unilever's commercial interest to improve water quality in Indonesia and also part of its social and environmental responsibility. Unilever Indonesia's Clean River program focuses sustainably on involving and training everybody living along the river to contribute to its improvement and provides training so that the villagers can look after the river in a self-sustaining way.*

A more coordinated approach to CSR might be achieved through creating Corporate Social Responsibility Agencies at regional and national as well as possibly local levels, to connect training investment to local knowledge, national practices and the creation of social value (including strong investment climates) as well as direct economic value.

## ***5. Technology and Innovation***

Few things seem more integral to knowledge economies than modern technologies, their prevalence and their use. One of the most significant “new basics”, of knowledge economy learning is the ability to learn and use skills in new technologies.

The need to acquire skills in information and computer technologies places immense demands on educational systems in less developed and transitional economies. First, there are the logistical challenges of technical infrastructure, power and electricity. Availability of and financial support for distribution of hardware and software come next. Issues of equality of access between rich and poor, women and men, and people in rural and isolated communities versus urban areas are a pervasive problem running through all these issues of access in the quest to close the growing digital divide between advanced and less developed economies.

Beyond these issues of initial access, even more sophisticated challenges concern pedagogically effective and sustainable forms of use. Private sector involvement through the investment of multinational hardware and software companies can boost rates of early adoption of new technology, but then the options and financial capacity of countries to maintain, renew and expand hardware and software in a sustainable, free and open way, are limited. More promotion and promulgation of open source software may offer one solution to this challenge of sustainability.

The greatest challenge to effective educational implementation of ICT repeats the pervasive problem of educational change in knowledge economies generally- the inability of schools to undertake reform in teaching and learning. Without attention to transformation in teaching and learning, the educational promise of technological change will always remain stillborn.

According to the Trust Fund projects, school computers are typically installed separately in a small lab, in the library if there is one, or in the administrator's office. They are rarely found in classrooms, which makes it almost impossible to integrate them effectively into the teaching and learning process. This challenge of new technologies therefore reiterates the call for quality teaching that can develop new knowledge economy basics of creativity, problem-solving, teamwork and so on.

One way to advance improvements that connect ICT adoption to quality teaching and learning is by promoting school-based participation in planning, developing and implementing technologically-driven change. It is noteworthy that in Trust Fund surveys, half the teachers surveyed feel they have indeed played an important role in such planning. Effective teacher learning and involvement also depends on equally effective processes of learning and involvement among school leaders. In the Trust Fund surveys, among all the people who have participated in the planning and decision-making processes to bring ICT to schools, the heads-of-school feel that they have had the greatest impact. This raises questions about the kinds of support and training that are necessary for them to become effective leaders of knowledge economy learning and technology implementation.

*In co-operation with public and private partners, universities, parents, school owners, and administrators, the ENLACES project in Chile sought to provide diverse leadership and local representation in order to ensure that informed judgment about technology use might improve and enhance learning across the country, especially in isolated and rural schools. In ENLACES, staff development for teachers (including the use of classroom facilitators) continues for at least two years with some activities extending beyond that period. Support is also sensitively differentiated based on differences in teachers' previous experience and attitude. A majority of Chilean classroom teachers now have PCs and Internet at home, and more than 80% have successfully completed two-year training in ICT with Enlaces, that familiarizes them with the basic uses of technology—in particular with Internet, word processing, spreadsheet and presentation software. Quality digital content in the form of CD and web-based resources also enables teachers to access information and materials to an*

*unprecedented degree. Most importantly, teachers from specific neighboring areas (or microcenters) work together to design activities in “communities of practice” where they learn how to use technology to improve teaching and learning.*

### ***Summary***

The five project areas are not mutually exclusive. Strong partnerships use advanced technology. The link between education and economic growth strengthens as the rate of technological transfer increases. More effective use of technology depends on better quality pedagogies and higher quality programs in teacher education. Investment climates try to change and not merely adapt to the contexts of partnership that include public provision. These issues surface more clearly in the cross-project themes.

### **Cross-Case Themes**

Across the diverse range of Trust Fund projects, nine significant themes and issues emerged from the analysis and review.

#### ***1. The Growing Divide***

Increased access to and quality of education, training and use of technology lead to improved educational opportunities and enhanced economic development. At the same time, current patterns of training access and provision are creating a disturbing escalator effect that is widening the gaps in achievement and participation between included and excluded populations.

Those who have initial access to further education and training are the most likely to take up other opportunities for yet more training, education and use of technology. Once on the escalator of opportunity and achievement, they rise to higher levels, other escalators, or lateral

walkways of even greater opportunities and all their accompanying benefits. Skill upgrading and technology transfer also operate in virtuous, self-reinforcing upward trajectories.

Those who do not get on the escalator, or who are scarcely aware it is there, are increasingly left behind, trapped in unemployment or the vast sector of the informal economy where training opportunities are unavailable or inappropriate.

Currently, therefore, while increased and long overdue training opportunities and provisions commonly lead to improvement for some and to overall economic development in many cases, these experiences of training appear to be exacerbating rather than alleviating the economic and achievement gaps between the wealthier and poorer populations in developing economies. Attention to widening the scope, reach and capture of initial training provision right into the informal economy, now appears to be a key priority.

## ***2. Lifelong Learning and Training***

Many of the studies and reports either examine or use the notion of lifelong learning as a framework for thinking about and implementing various forms of skills training particularly as it relates to the knowledge economy. While conceptualizations of lifelong learning vary across the projects, many of them equate it with more specific kinds of training. Yet a robust lifelong learning framework encompasses learning throughout the life cycle, from early childhood to retirement. It includes formal, non-formal, and informal education and training that addresses civic and personal interests as well as labor market demands.

There is a significant gap between the theory and rhetoric of lifelong learning for the new economy, and the actual practices and policies of governments and most workplaces. While the rhetoric talks about global competitiveness, most workers scrape out a living in the informal economy; while the rhetoric refers to knowledge jobs, most employment is more menial in nature; while the rhetoric emphasizes ongoing skills training for all, it is predominantly the well educated in larger firms who have access to skills training; and while the rhetoric discusses the value of knowledge work, proportionally few jobs and little of the content in the training that is offered in developing economies actually conforms to the “knowledge work” category.

More robust images of lifelong learning are ones where people have the skills, dispositions and values to continually access information and build knowledge not only for the workplace but for the family, community and society; where people have initiative, are problem-solvers, are creative and innovative in making the most of their life chances and are willing and able to contribute to the greater good.

These more robust and inclusive visions of lifelong learning needs to be affirmed and applied in all projects focused on knowledge economy objectives; to be incorporated into internal quality assurance mechanisms within the World Bank/DfID and other donor agencies so that they do not become narrowed into technical training; and to be pursued outside the formal sector as well as within it.

### ***3. Quality***

The agenda for educational improvement in developing and transitional economies is moving from one of access to quality. In emerging knowledge economies, increased access is a necessary but not a sufficient condition for significant improvement. Countries seeking to evolve into complex knowledge economies now require the attraction and development of high quality teachers, and high quality practices of teaching and learning related to knowledge economy and knowledge society competencies, if they are to become successful. Yet in secondary education, TVET and teacher education, well qualified teachers who provide good quality education are a scarce resource – with low pay, low status and poor support being the major barriers to improvement.

It is not nearly so easy to quantify quality as it is to measure levels of access. Numbers and types of qualified teachers can serve as one proxy for quality, but the content of teacher preparation courses often builds little capability to develop and deliver knowledge economy

pedagogies. Standards frameworks can provide clear pointers towards where and how quality should be improved – but frameworks imported from other countries may be too far ahead of the contexts in which they are being applied, and they have little value unless there are clear strategies to develop teachers' capacity to meet them. Finally, quality assurance systems of data and information are only useful if they allow comparisons with similar countries that perform at a different level, and if they provide local information and feedback about the settings that people can immediately affect.

More promising strategies for improving the quality of teaching and teacher education involve reorganizations from consecutive to concurrent teacher education provision, on a career-long continuum of professional learning that is integrated with school-level and system-wide improvement initiatives.

#### ***4. Pedagogy***

Fast moving and flexible knowledge economies require knowledge workers who exhibit creativity and flexibility, who are innovation-oriented, who are committed to lifelong learning and respond well to needs for retraining, who can share information and develop solutions openly and collaboratively, and who are skilled in the use of modern technologies. Secure and open knowledge societies which provide the conditions in which knowledge economies flourish, call for citizens who value and contribute to the public good, who can work and live with increasing cultural and religious diversity, who can develop open and trusting relationships with others and resolve conflicts peacefully, who have a cosmopolitan knowledge of, interest in and active engagement with cultures in other parts of the world, who can care for others in strong communities, who are resilient in the face of adversity and who use the natural world and its resources sustainably.

Creative knowledge economies and secure knowledge societies go hand in hand. Their development and maintenance place significant demands on the schools and educational systems which are responsible for cultivating the skills and dispositions that are essential in a knowledge-driven world, that is swathed in insecurity.

Teaching and learning in the knowledge society have to be able to foster creativity and problem-solving capacity, be amenable to collaborative and team-based organization, be ready to encompass a broad curriculum that is not confined to the minimal requirements of technical training or the basics of literacy and numeracy, be able to incorporate new technology, and be sensitive to offering flexible and personalized forms of delivery.

Yet most pedagogies in developing and transitional economies remain stubbornly traditional and woefully inadequate for knowledge economy needs. Clearly, one of the greatest challenges for donor agencies in the years ahead is how to break this vicious and debilitating cycle of poor teaching quality and low grade pedagogy, and to devise more appropriate ways of measuring and documenting the effects of future interventions in this regard.

## ***5. Technology***

The Knowledge and Skills Trust Fund reports make many references to efforts to link increasingly sophisticated uses of technology with greater skill development; resulting in upward spirals of improvement in developing economies.

Some successes are described of larger, export-oriented firms introducing sophisticated technologies and providing appropriate training so that local workers can use them effectively, though the danger remains that when advanced technology is imported from highly developed economies, it can be too far ahead of local capacity – even where additional training is provided.

Lower-tech solutions sometimes provide more sustainable options in very poor countries and regions, developing local capacity to a point that might be able to sustain higher tech solutions later. Technological initiatives that connect with and capitalize in indigenous cultural capital also show great promise.

Development of technological expertise and capability begins in school where more affordable and open-access solutions offered by open-source software are worthy of further exploration. Pedagogically, apart from a few exceptions, new technologies are largely being tacked on to existing school structures and incorporated into traditional classroom pedagogies, rather than transforming the quality of teaching and learning in ways that are appropriate for knowledge economy needs.

#### ***6. Public and Private Responsibilities***

The most consistent patterns of success in knowledge and skills development are associated with private rather than public initiatives. By contrast, public sector practice and provision is portrayed as bureaucratic, inflexible, outdated, uncompetitive and sometimes corrupt. Yet the obvious strategy of shifting more support to the private sector has limitations. Investment in the vast informal economy which yields few or no immediate returns is much better orchestrated by the public sector, for example. And in Africa, many of the most successful initiatives in the informal economy are led by voluntary and religious organizations, and other NGOs.

Emerging global trends suggest a more complex mix of public and private strategies as the path to economic success – for instance in China and Malaysia. Indeed, some of the most successful examples of training and lifelong learning initiatives embody these principles of

public/private partnerships. Supporting both sectors, especially where they work in partnership with one another, therefore seems to have greatest merit.

### ***7. Culture and Context***

The capacity to provide effective support for knowledge and skills development is profoundly influenced by the political and social climate for investment. Hitherto, in line with conventional economic thinking, there has been a tendency to treat these contextual factors as unalterable “givens” or “externalities”. The result has been a tendency to build an investment by-pass around the public system or to employ models of technology, standards frameworks, data management and decentralization that are imported from more developed societies, with little regard for how the cultures into which they are inserted will nuance or nullify them over time. With the shift from institutional access to cultural quality, the likelihood of failed implementation due to such misunderstanding is magnified.

Yet the reports show glimpses of emerging efforts to work *with* local cultures whenever possible, identifying and building on the social capital and other assets they contain, rather than viewing them largely as impediments and deficits. Given these insights and experiments, more complex models of mixed and varied public and private support and intervention strategies, that address cultural and political as well as economic change, are now beginning to emerge.

### ***8. Theories of Change***

The seventeen Trust Fund reports represent the beginnings of a shift in educational change and reform strategy. Established theories of change have emphasized structures and educational access. Centrally imposed standards frameworks and performance targets have been advocated to provide a common sense of direction and a yardstick for accountability, while decentralized management and private incentives and funding have been promoted as ways to

deliver results more flexibly and effectively, without the hindrance or expense of centralized state bureaucracies. Assessment of learning, in the form of tested achievement, is regarded as a way to measure and monitor program accountability, and to prompt increased attention to improvement by making international comparisons of performance public. In all this, traditional culture is a restriction on modernization, more than a resource for its development.

The emergent theory of change, adjusting to the fast-growing reach of a knowledge economy world, in an age of increasing insecurity, moves beyond issues of access to questions of quality. Standards are defined in ways that bring them closer to the realities of existing practice with more attention being paid to developing people's capacity to meet higher standards, than to adhering to the paper standards themselves. Neither centralization nor decentralization, public nor private investment, are objects of ideological advocacy, but areas for pragmatic judgment, where the balance and mix of centralized/decentralized, public/private is decided according to what is most "fit for purpose" in the country and culture concerned.

In the emergent theory of change, imposed strategies of standardization and privatization are replaced by a greater emphasis on public/private partnerships, network-based and peer-driven forms of positive pressure, and more flexible, just-in-time, localized and personalized forms of program delivery. *Assessment of learning* in the form of data used for summative quality assurance once educational outputs are completed, is replaced by *assessment for learning*, where data are used to inform ongoing decisions and adjustments in quality and processes in order to produce better outcomes. In the emergent theory of change, existing cultures are regarded as containing usable assets for modernization and not just as presenting impediments to it.

## ***9. Country Frameworks and Typologies***

Country typologies can provide useful guides and clues to investment and training strategies. The projects here are too diverse and incomplete to justify new typologies but they do suggest 10 dimensions along which progress can be ranked. These dimensions are listed in the main report.

### **Gaps and Future Directions**

The Trust Fund reports have given rise to significant findings – the link between economic opportunity and development and educational training; the connection of this link to upward spirals of technology implementation and integration; the importance of developing clear emphases on and broad interpretations of lifelong learning; the shifting terrain of policy intervention from educational access to improvement of pedagogical quality and systemic quality assurance; the struggle to make strides in the low status technical and vocational educational sector and the even greater struggle to make any worthwhile training impacts in the vast informal economy.

Among these trends and findings, emergent signs of promise and of positive new practices are evident– the power of public-private partnerships in a world where these sectors had often been regarded as opposed; the emerging recognition being given to the voluntary and religious sectors in terms of their contribution to training and development; the untapped power of diasporas in an increasingly network-driven world; the potential of lower-cost, more sustainable technology initiatives such as audio-based learning and open source software to provide first steps on to the escalator of development and opportunity; and the credence given to case study reports and methodologies alongside conventional econometric analyses as ways of

deriving insight from the secret successes of interesting outlier initiatives, and into the indigenous capital of cultures where interventions are being attempted.

The Trust Fund reports also expose and highlight a number of gaps in research and strategic knowledge that might set a useful agenda for further inquiry and intervention strategy by the World Bank, DfID and other donor agencies. Because these gaps and recommendations are made succinctly in the full report, and because of their strategic importance, they are reproduced here verbatim.

### **School-to-work Transition**

- How are developing and transition countries building national qualification systems? How do those systems contribute to articulating secondary education, vocational training, tertiary education and lifelong learning approaches?
- How do such systems articulate between and among countries? How do they add to labor mobility and what is their impact on migration?
- What is the impact of certification systems on the employability of graduates, mobility of workers, etc.?
- How many students drop out of post-compulsory education before receiving a diploma and, most importantly, what happens to them, in terms of employment, mobility, further learning opportunities, etc.?
- Under what conditions do private and corporate partnerships strengthen or weaken access to knowledge economy and knowledge society opportunities?
- How well-integrated are the certification systems regarding labor market information about relative scarcities (i.e, which certified skills are more scarce), and how well do schools in middle-income or poor countries relay information to students on what the various certification systems and labor market information systems have to say about the job market?
- What are the characteristics of higher education programs with strong labor market linkages in developing countries? (e.g. locally-relevant fields of study, governance with civil society/industry participation, internships/practical training, applied academic research, etc.?)
- What measures can be taken to significantly increase literacy achievement in basic education so that lifelong learning is not disproportionately directed to remediating deficits in literacy among adults in training programs?

### **Informal Economy**

- How can we document more effectively what skills and competencies are actually being learned in the informal economy, whether these are relevant to knowledge economy objectives and what successful strategies currently exist for transitioning workers with these skills into the formal economy through prior learning assessment etc?
- What homegrown, local models of learning, teaching and training hold promise for wider adaptation within a low-cost, long-lasting and sustainable process for improving teaching quality and developing knowledge economy and society skills and competencies?
- What are the more effective community-based models for developing competencies? How might these have an impact on skills and labor?

### **Competency-based, skill-based and outcome-oriented curriculum reform**

- Is there a viable version of the so-called 21st century Key Competencies taking shape in developing countries? What is the role of those competencies and standards in both citizenship education and school to work transition?
- How can post-compulsory offerings be diversified through alternative pathways, without creating more *cul-de-sacs* of failure?
- How do non-university tertiary education programs develop effective competencies in developing countries?
- How do systems of standards and competencies need to be developed in ways that are appropriately ambitious yet also sufficiently realistic, given existing levels of capacity in developing and transitional countries?
- What tools or strategies can be identified or devised that locate and link standards frameworks and capacity levels so that they interact and propel one another through upward spirals of development and improvement?

### **Education and Labor Markets**

- What measures have been and can be taken to raise the status and attractiveness of TVET within less developed and emerging economies?
- What reforms can be implemented to improve the effectiveness of TVET and thereby increase its attractiveness?
- What types of second-chance education and training programs for school dropouts currently exist in developing countries? How effective are they at helping participants link to the labor market?
- What types of formal and non-formal education and training programs lead to better short term employment outcomes as well as improved capacity for lifelong learning?
- What measures are tertiary education institutions in developing countries taking to avoid outward migration and retain their highly skilled graduates?
- Where have universities partnered successfully with business as well as social and community agencies to initiate successful development and training initiatives for the knowledge economy. What are the key characteristics of these partnerships? How might they be replicated elsewhere?

## **Human resource policies (teachers and leaders within educational institutions)**

- What are the relative payoffs of professional learning communities vs. models of prescribed instruction as ways of developing and delivering quality teaching and learning in less developed and transitional economies?
- Given the connection of leadership to learning outcomes, what current policies and strategies of leadership for learning in less developed and transitional economies are being proposed and which ones are most beneficial for their impact on student learning via developing and supporting teaching quality?
- What kind of pre-service and in-service training best supports various educational reform goals and agendas, such as competency-based curriculum, outcome-oriented instruction, decentralization, etc.?
- How are teacher education studies – and specialized institutions – being positioned in contemporary higher education institutions?
- What performance measures are being used or introduced to assess quality of faculty at tertiary education institutions in developing countries? How effective are they? (tenure, output measures, etc.). What incentives or rewards are being introduced to improve teaching quality?
- How and to what extent are training and development strategies in teacher education being aligned with ambitious but achievable standards and competencies frameworks for teachers and teacher educators alike?
- What alternative models for delivering teacher education other than short-term, consecutive ones can be developed that contribute simultaneously to improving individual teacher quality and the quality of pedagogy and organization in existing schools?
- In countries with increasing institutional autonomy in tertiary education, how are such institutions building human resource management capacity? (Capacity to employ, promote, diversify incentives, and terminate faculty and staff effectively.)

## **Quality Teaching and Teaching Quality in a Knowledge Society**

- What does quality teaching look like in developing or emerging settings within a knowledge economy framework and what factors beyond standards frameworks are necessary to create it?
- Which are the most pertinent and useful alternative delivery modes, methodological approaches and teaching skills in a knowledge society?
- How do emerging quality assurance systems evaluate teaching and learning? What is the impact of quality assurance mechanisms on teaching and learning in tertiary education?

## **Monitoring and Evaluation**

- How can policy and administrative systems in less developed and transitional economies develop cultures of assessment FOR learning and not merely assessment OF learning?
- What is the evidence and what are the indicators that knowledge economy skills and new basics are being taught and learned in practice? How can labor market outcomes be assessed for youths who are taught the new skills and competences?
- What is the impact, in tertiary education, of the expansion of quality assurance regimes, on the assessment of teaching and learning for the knowledge economy?
- What are the scaled up possibilities for collecting and applying local data about market opportunities and saturation, as a way to guide just-in-time, localized training initiatives.

## **Role of ICTs**

- What successful models exist of ICT adoption, where there are clear benefits for the improvement of teaching and learning in relation to knowledge economy skills and competencies and for effective quality instruction in general?
- To what extent have ICTs become a new environment of communication, socialization and networking for young people, even leading to new forms of citizenship? What are the implications of ICT implementation for secondary and tertiary education, in particular concerning curriculum reform and teaching/learning methodology?
- How are tertiary education institutions in the developing world evolving with the advent of wireless technology and cheaper, more powerful technology? Are they lagging or leapfrogging? What is the impact on teaching, learning and research?
- What are the relative benefits for start-up and sustainability of multinational based vs. more open-source driven uses of software?

## **Science and Technology**

- How can international aid be used for accelerating technological learning in less developed and transitional economies at different levels of development?
- How can “aid-enabled” technological learning contribute to improving developing countries’ productivity and competitiveness in the global knowledge economy? What lessons should be drawn from past Overseas Development Aid projects with science and technology components?
- How can developing countries maximize their technological learning from FDI and international R&D cooperation? In this connection, what should be the role of public-private partnerships?
- How can science and technology capacity building in developing countries help to meet the development goals in socially and environmentally sustainable ways?
- What can less developed and transitional countries do to alleviate or even reverse the ‘brain drain’ as a major obstacle to national human capital accumulation?

- What low cost, lower tech solutions (e.g. mobile phone technologies, audio materials) provide the best initial leverage in moving many people in less developed countries on to the escalator of training and opportunity?

### **Culture and Context**

- What assets or forms of local cultural capital are contained in indigenous cultures and traditional families and communities that are pertinent to learning and training in a knowledge economy and society? How can reform and intervention programs effectively audit, then capitalize on these forms of indigenous capital?
- In an era of quality improvement, which disciplines and strategies will best help international aid and donor agencies to understand and work successfully and productively with local and national cultures where development initiatives are being attempted?
- How can existing typologies of development be further modified to account for and integrate the varying paths to development taken by different countries in recent times, and in an age of insecurity to account for key social and political influences in post-conflict, post-totalitarian, post-colonial and post-apartheid regimes?

### **Change and Sustainability**

- As a complement to teaching reform alternatives to key policymakers, what are the reliable, evidence-based aspects of *change process* (implementation, leadership, capacity-building, sustainability, etc.) that could be included within these courses, and what methods of instruction on these courses best represent these principles of change process, and assure successful subsequent implementation by the participants?
- What home-grown, local, capacity-building models of learning, teaching and training hold the best promise for wider adaptation within a low-cost, long-lasting and sustainable process for improving teaching quality and developing knowledge economy and society skills and competencies?
- What measurable indicators of sustainability can be developed that would serve as useful guides and quality assurance mechanisms for steering and evaluating intervention by international donor agencies in the areas of education, training and development? Drawing on Hargreaves and Fink (A. Hargreaves & Fink, 2006) how might these indicators include attention to the following key components of sustainability.
  - *depth* of attention to actual knowledge economy competencies, authentic lifelong learning and quality teaching and pedagogy
  - *endurance* of initiatives and their success over time beyond the initial period of funding and implementation
  - *breadth* of “scaled up” impact across many institutions, systems and even societies through locally adaptable models that motivate and secure shared involvement and responsibility
  - *justice* of ensuring that training and lifelong learning inclusively benefit all, not just those who have already received some of it or who already work outside the informal economy

- *diversity* of schemes that have a “fit-for-purpose” response to local contexts and that link and network partners together in support of their development
- *conservation* not eradication of existing knowledge and tradition whenever possible as powerful sources of indigenous capital
- *resourcefulness* in terms of affordable use of long-term financial resources, prudent (not depleting) uses of human energy and resources, and environmentally sustainable use of natural resources.