



INDICATORS OF SKILLS FOR EMPLOYMENT AND PRODUCTIVITY: A CONCEPTUAL FRAMEWORK AND APPROACH FOR LOW-INCOME COUNTRIES

**OECD and the World Bank
in collaboration with ETF, ILO and UNESCO**

**A REPORT FOR THE HUMAN RESOURCE DEVELOPMENT PILLAR
OF THE G20 MULTI-YEAR ACTION PLAN ON DEVELOPMENT**

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FOREWORD

The skills possessed by each country's population provide the fundamental determinants of prosperity and well-being. However, developing skills is costly and so investments in skill building need to be made wisely. This requires good information about: where skill development is most needed; how well the skills individuals have acquired are matched with those required in the labour market; and the returns on investments in skills in terms of their economic and social outcomes. Putting in place a comprehensive system of information relating to skills development is not easy and is particularly challenging in low-income countries with very limited resources to devote to a strong statistical infrastructure of data collection, processing, analysis and dissemination.

Therefore, this report seeks to provide a framework for the collection of statistical indicators which can be used to guide skill development with a focus on low income countries but which can also be used to allow each country to benchmark its progress against that of other countries, including more economically developed countries. A preliminary list of indicators is also presented in the report as well as a stock-take of data availability and the key areas where further statistical capacity building efforts may be required.

The report was prepared as part of the work that various international organisations have been carrying out under the Multi-Year Action Plan on Development that was adopted by G20 leaders at their Seoul Summit in November 2010. Of the nine pillars underpinning the G20 Action Plan, the Human Resource Development (HRD) pillar called for the relevant international organisation to create a set of internationally comparable skills indicators for developing countries. The OECD, together with the World Bank, subsequently took the lead in responding to this call on behalf, and with the active support and cooperation, of ETF, ILO and UNESCO. This report is the result of this collaboration and will be followed up in 2014, subject to obtaining funding, with the development of an international database of skills indicators and an accompanying report on the database and options for further development.

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ACRONYMS

CONFEMEN	Conférence des ministres de l'éducation des pays ayant le français en partage (Conference of Francophone Education Ministers)
DHS	USAID Demographic and Health Survey
ETF	European Training Foundation
Eurostat	Statistical Office of the European Union
HDR	UNDP's annual Human Development Report
IAG-TVET	Inter-Agency Group on Technical and Vocational Education and Training
IEA	International Association for the Evaluation of Educational Achievement
ILO	International Labour Organisation
KILM	ILO
LAMP	UIS Literacy Assessment and Monitoring Programme
LICs	Low Income Countries
OECD	Organisation for Economic Development and Cooperation
PASEC	Programme d'analyse des systèmes éducatifs de la CONFEMEN (Programme on the Analysis of Education Systems)
PIAAC	OECD Programme for the International Assessment of Adult Competencies
PIRLS	IEA Progress in International Reading Literacy Study
PISA	OECD Programme for International Student Assessment
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
STEP	World Bank Skills toward Employment and Productivity Skills Measurement Study
TIMSS	IEA Trends in International Mathematics and Science Study
UCW	UNICEF Understanding Children's Work
UIS	UNESCO Institute of Statistics
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UNPOP	United Nations Department of Economic and Social Affairs, Population Division
USAID	United States Agency for International Development
WB	World Bank
WBI	World Bank Indicators
WBES	World Bank Employment Surveys
WHO	World Health Organisation

EXECUTIVE SUMMARY

Skills are a key determinant of prosperity and well-being. Hence, policies on skill development need to be made with the best information available, particularly in Low Income Countries (LICs) where resources for investment in skills are severely constrained and can ill afford to be wasted.

This report presents a conceptual framework for choosing the most appropriate skills indicators to guide skills development policies and to benchmark country performance. Based on this framework an initial set of internationally comparable indicators is proposed. The report responds to a call for international organisations to develop comparable skills indicators for employment and productivity in developing countries, particularly LICs. This call was made under the Human Resource Development (HRD) pillar of the G20 Multi-Year Action Plan for Development.

The conceptual framework developed in the report consists of five inter-related domains of indicators, including: **contextual factors** which drive both the supply of and demand for skills; **skill acquisition** which covers investments in skills, the stock of human capital and its distribution; **skill requirements** which measure the demand for skills arising in the labour market; the degree of **matching** which captures how well skills obtained through education and training correspond to the skills required in the labour market; and **outcomes** which reflect the impact of skills on economic performance and employment and social outcomes.

A set of indicators is then proposed in the report using this framework and based on the criteria of: relevance, feasibility, comparability and timeliness. A distinction is made between core indicators, which are seen as both essential and potentially available for a wide range of LICs, and supplementary indicators which, while desirable, are not yet widely available for LICs. Altogether, 58 core indicators and 10 supplementary indicators were identified based on a preliminary survey of available international databases that could be used as secondary sources for obtaining these indicators.

An in-depth inventory of data availability was then carried out to determine more precisely the extent of the gaps in country coverage for each indicator. This exercise was carried out for all countries and not just the LICs. The inventory covered the databases of the key international organisations, including the ILO, OECD, UNESCO, WHO and the World Bank as well as Eurostat and other sources of international data on skills. For many of the indicators, the relevant data already exists but in some cases it may be necessary to go back to the primary data sources to obtain the data required to construct the indicators. For a few indicators, there are large holes in country coverage, especially for LICs. This included the indicators for: earnings by education and occupation; the education level of young mothers, adult training participation; hard-to-fill vacancies; and skill requirements.

Finally, the report puts forward a proposal for the development and maintenance of the international database containing these indicators as well as for some ongoing capacity building to help countries develop the necessary statistical infrastructure to supply the data required to construct these indicators and also to develop their capacity to use these international indicators together with a range of more country-specific indicators to guide their skills development policies.

Introduction

The confluence of technological advancement, globalisation and economic liberalisation in recent years has prompted governments in developed and developing countries alike to prioritise skills development as a key strategy for economic competitiveness and growth. In developing countries, especially the poorest ones, the challenges are profound and complex. Policy makers acknowledge the critical role of a strong human resource base in complementing other investments and policies to boost productivity and economic progress. Yet while these countries are deficient in skills (*e.g.* as measured by educational attainment) relative to richer countries, significant numbers of those who are educated and trained end up unemployed, working in jobs that under-utilise their skills or emigrating to other countries. The result is a misallocation and waste of resources that these countries can ill afford. Low-income countries are therefore in urgent need of new strategies and approaches that focus more explicitly on the link between investments in skills development and employment and productivity.

Reflecting an international consensus on the critical role of skills for economic advancement, including in the poorest countries, the G20 leaders included human resource development as one of nine pillars in the group's Multi-Year Action Plan on Development adopted at its Seoul Summit in November 2010. For the HRD pillar, the G20 Action Plan envisages two actions: (1) create internationally comparable skills indicators; and (2) enhance national employable skills strategies. (see Box 1).

This report focuses on the first of these actions for which the G20 requested the OECD, ILO, UNESCO and World Bank to collaborate on the development of a set of internationally comparable indicators of skills for developing countries. Such a database would in fact underpin the work envisaged under Action 2. It would enhance the evidence upon which countries, particularly low income countries (LICs), might design skills policies and programs and monitor their impact on key outcomes, including responsiveness to current and emerging patterns of labour market demand, employability, productivity, health status, gender equity, and lifelong learning. To be useful, the database would contain information on a wide range of countries so as to enable LICs and other developing countries to put their skills challenges and performance in a comparative perspective.

The objective of this report is to develop a conceptual framework of the information required to guide skill development policies and identify a set of indicators that could form the basis of an internationally comparable database of indicators of skills. It builds upon a substantial body of work by various International Organisations (IOs) in developing indicators of skills and attempts to adapt this work to the particular context of developing countries in terms of their data needs and data constraints. In particular, it builds upon the work of the Inter-Agency Group on Technical and Vocational Education and Training (IAG-TVET) which has established guidelines for the development of indicators in the area of TVET.

The rest of the report is structured as follows. In the next section, a simple conceptual framework and set of criteria are developed to guide the choice of indicators to clarify critical elements of the skills challenge in developing countries. A list of indicators is then identified in Section 2. As set out in Section 3, the choice of indicators should not just be based on those that have been traditionally available but should also take into account the results of a number of ongoing collaborative efforts to explore the collection of new, internationally-comparable, data on skills indicators in a number of both richer and poorer countries. A detailed inventory of data availability for the indicators identified in Section 2 is presented in Section 4. The next steps in terms of

constructing an international database for these indicators and in building statistical capacity are set out in Section 5. This is followed by some brief conclusions.

Box 1. G20 Human Resource Development pillar

Developing human capital is a critical component of any country's growth and poverty reduction strategy. Adding to education initiatives related to the Millennium Development Goals (MDGs), it is important for developing countries, in particular LICs, to continue to develop employment-related skills that are better matched to employer and market needs in order to attract investment and decent jobs.

Action 1: Create Internationally Comparable Skills Indicators

We call upon the World Bank, ILO, OECD and UNESCO to work together to develop internationally comparable and practical indicators of skills for employment and productivity in developing countries, particularly LICs, to assist them to:

- Better match training to employers' needs and future labour market opportunities in developing countries;
- Identify gaps in the education system for basic level employable skills;
- Identify the links between education, health problems, gender gaps and life-long skills development; and
- Produce a comparable database across countries to serve as a monitoring tool for assessing employable skills development in LICs.

The relevant institutions will submit an interim report at the Summit in France, a final report on the skills indicators by 2012, and a final report on the comparable database by late 2014.

Action 2: Enhance National Employable Skills Strategies

The MDBs, ILO, OECD and UNESCO have agreed today to form a unified and coordinated team with the aim of supporting a pilot group of self-selected LICs to enhance their national strategies to enhance their national strategies to develop skills, improve productivity in existing jobs, and promote investment in new jobs. This action should:

- Focus on strengthening national and regional vocational education and training institutions and programs;
- Build on the G20 Training Strategy submitted at the Toronto Summit and begin by identifying existing gaps that act as barriers to increasing investment in skills development and productivity, including through considering the impact of gender gaps and health problems such as non-communicable diseases; and
- Review the work done and, based on the results achieved, consider a wider roll-out of the program to LICs and middle income countries.

Source: G20 Seoul Summit, Leaders' Declaration, November 11-12, 2010, Annex II, Multi-Year Action Plan on Development.

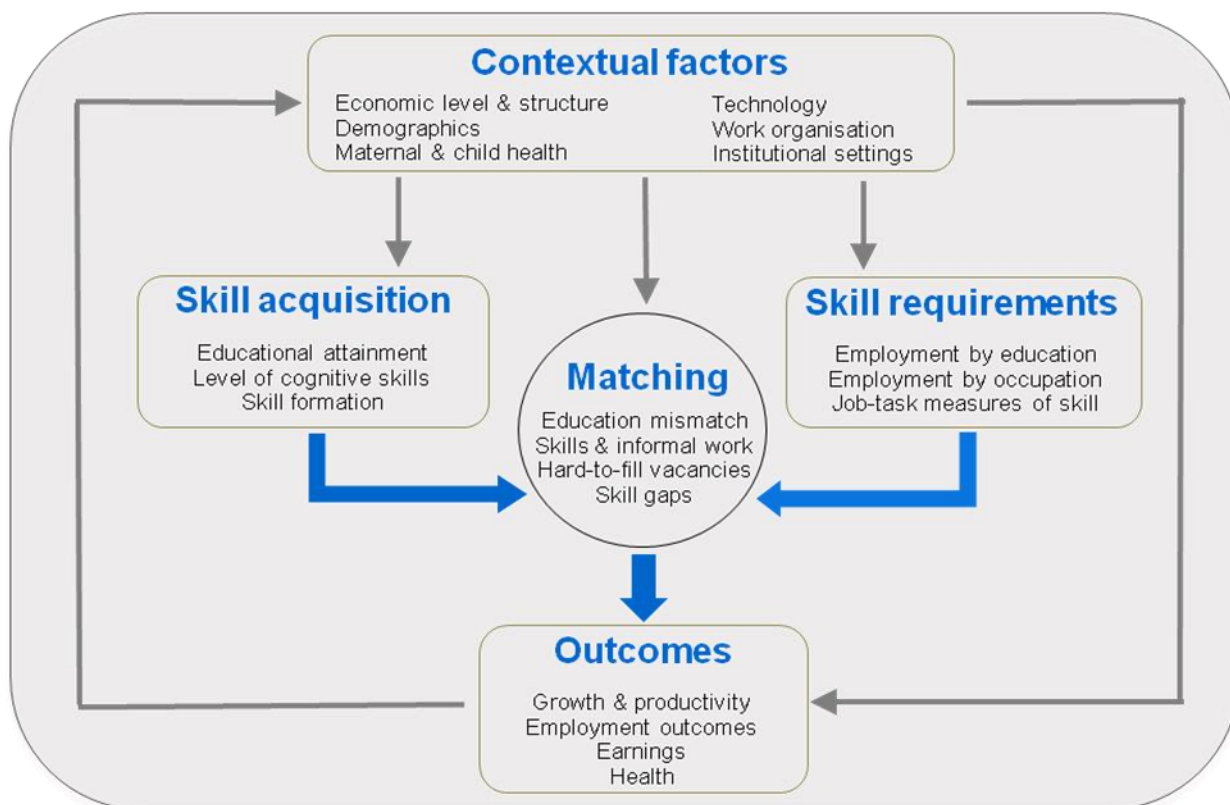
1. Conceptual framework

The conceptual framework proposed for identifying a set of potential skills indicators is set out in Figure 1. Five broad indicator domains are identified which are related as follows. There are a range of factors (**contextual factors**) driving both the supply of skills (**skill acquisition**) and the demand for skills (**skill requirements**). These factors will also have an impact on how well skills obtained through education and training are matched to skills required in the labour market (**matching**) which in turn will have an impact on economic performance, labour market outcomes and social outcomes, such as health (**outcomes**).

The framework makes it clear that a range of indicators are necessary that go beyond just measuring the stock of human capital in each country and investments in this human capital. By

situating these indicators under a common conceptual framework, the resulting database offers a “one-stop” location that analysts can use to create a statistical snapshot of the current status of skills development in a given country and put the picture in comparative perspective. If well-maintained and up-to-date, this resource would reduce the time it takes to mobilise data that are often now scattered in various publications and databases. The statistical profile would not be sufficient to determine policy, but it would provide a useful starting point for developing a more detailed picture based on additional country-specific data and analyses.

Figure 1. Conceptual framework for indicators of skills



Within this framework, the following criteria have been used to select core skills indicators for each of the five broad skill domains:

- **Relevance.** The indicators should provide information that provide a useful comparative backdrop for assisting developing countries, particularly LICs, to identify priorities for skills development and to monitor the impact of their strategies in this regard;
- **Feasibility.** The indicators should focus 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 reasonably accurately.

2. Proposed set of indicators

Based on these criteria and the conceptual framework, a set of “core” indicators was selected within each broad domain following an initial survey of data availability. These are indicators which are considered to be both essential for monitoring and designing skill development policies but also feasible to collect for many LICs. The resulting list is summarised in Table 1 under each of the five indicator domains. Further details are provided in Annex A for each indicator in terms of its construction, rationale, data source and coverage. A number of “supplementary” indicators have been included even though they are not currently available for many countries. Nevertheless, they are considered to be highly policy-relevant indicators and therefore potential candidates for further data-collection efforts. The five broad indicator domains are described in more detail below as well as the choice of indicators within each domain.

Contextual factors

A set of contextual indicators is required to capture the main drivers of skill supplies and demands as well as the key factors affecting the efficiency of the matching process between them. Many of these factors will also affect the outcomes of skill use. Accordingly, a range of indicators is proposed covering five main areas: aggregate economic conditions, demographics, early childhood development, technology and work conditions, and education and labour-market institutions and policy settings.

Skill acquisition

The domain of skill acquisition is divided into two broad areas. The first area covers the stock of human capital in the economy which has been acquired through past investments in skill formation and which is a key driver of economic growth and source of skills for meeting the requirements of employers. This is captured by indicators of educational attainment and literacy which will capture **gaps in the education system for basic level employable skills**. Also included are supplementary indicators of proficiency in foundation skills such as literacy and numeracy skills which are based on direct assessments of these skills (e.g. as carried out in the OECD’s PIAAC survey, UIS LAMP survey and the World Bank’s STEP survey, see Section 3). The second area covers ongoing investments in skill formation. This is captured by indicators on access to education and training, and opportunities for lifelong skills development. Indicators are also included of the extent to which skills are being developed in the crucial growth-enhancing fields of science, technology, engineering and mathematics (STEM). Apprenticeships are also a key path to skill development for many young people and, while comparable data are currently not readily available, a supplementary indicator on participation in apprenticeships has been included.

Table 1. Proposed list of indicators

Contextual factors	Skill acquisition	Skill requirements	Matching	Outcomes
GDP	Educational attainment of the population aged 25 and over	Employment shares by level of education	Proportion of workers who are overqualified or underqualified	Growth in GDP
GNI per capita	Youth and adult literacy rate	Employment shares by occupation	Proportion of qualified workers working in the informal sector	Labour productivity (per worker and per hour worked)
Employment shares by sector	<i>Supplementary indicator:</i> Cognitive skills of students	Incidence of self-employment	<i>Supplementary indicator:</i> Hard-to-fill vacancies (by occupation).	Employment rate (total and by education and gender)
Trade openness	<i>Supplementary indicator:</i> Cognitive skills of adults	<i>Supplementary indicator:</i> Job-task measures of skill use at work	<i>Supplementary indicator:</i> Skill gaps	Employment rate of youth by education, age and gender
Human Development Index	Gross and net enrolment rate in primary education	<i>Supplementary indicator:</i> Job requirements by qualification	Changes in earnings by education	Job quality by education (in informal employment and temporary jobs)
Total Population	Primary education completion : enrolment rate in final year		Changes in earnings by occupation	Unemployment rate (total and by education and gender)
Relative size of youth population	Gross and net enrolment rate in secondary education		Changes in unemployment rates by education	Unemployment rate of youth by education, age and gender
Share of population living in urban areas	Lower secondary education completion: survival rate to the last grade			Youth at risk (by school completion)
Early childhood health	Share of vocational programmes in upper secondary education			Earnings by education and gender
Educational attainment of women with young children	Gross enrolment rate in tertiary education			Earnings by occupation and gender
Access to internet	Education enrolment rate of young adults			Income inequality
Access to mobile phones	Share of tertiary graduates (enrolments) in STEM subjects			Incidence of poverty
Public expenditure on education	<i>Supplementary indicator:</i> Participation in apprenticeships			<i>Supplementary indicator:</i> Prevalence of HIV by education and gender
Pupil-teacher ratio (in primary and lower and upper secondary schools)	<i>Supplementary indicator:</i> Participation in education and training by (working) adults			<i>Supplementary indicator:</i> Infant mortality rate by mother's education
Employment in the informal sector				
Ease of doing business				

Skill requirements

Skill requirements (i.e. the demand for and utilisation of skills) **will** ultimately **determine how productive each country's economy is and its growth potential**. Two key indicators are proposed, including employment shares by education background and occupation. In addition, an indicator has been included on the importance of self-employment, as this form of employment is very common in most LICs and requires its own set of skills, particularly entrepreneurial skills. Ideally, it would be desirable to use indicators that are based on more direct measures of skills used at work. Therefore, a supplementary set of indicators is proposed which draws on the work that is being carried out in new international surveys of adult skills which measure skill use at work based on information obtained from workers about their jobs tasks (e.g. as is the case on the OECD's PIAAC survey and the World Bank's STEP survey, see Section 3).

Matching

Indicators are also required on the **efficiency of matching skills** that have been obtained through education and training with those required by employers and the self-employed. Indicators of over- and under-qualification are put forward as one way to measure this, although a more direct measure of skills rather than qualifications would be preferable but is not possible because of limited data availability. Two other, more indirect, indicators of the matching process are proposed. These are changes in unemployment rates and earnings differentials by educational attainment (and by occupation). All else equal, a rise in the returns to higher education or a drop in the unemployment rate associated with this level (relative to the overall unemployment rate) would suggest that the demand for workers with these qualifications is outstripping supply. Ideally, it would be useful to supplement these indicators with information based on employer surveys of skill gaps and shortages. Therefore, supplementary measures for these dimensions have been included, although issues of comparability and limited availability will need to be resolved before they could be included in an international dataset.

Outcomes

Finally, a number of indicators have been selected which may provide some information on the **links between skills and economic, employment and social outcomes**. In terms of economic performance, the selected indicators cover GDP growth and the level and growth of labour productivity. Employment outcomes are represented by indicators of employment rates, unemployment, youth not in employment or school, and earnings. Social outcomes are reflected in indicators of income inequality and poverty. Supplementary indicators have been included for health outcomes covering general HIV prevalence and infant mortality by mother's education level.

3. Adding a third generation of new, internationally comparable skills indicators

The core indicators identified above mainly refer to what might be characterised as first and second generation measures of skills. Indicators in the first generation share the following features: they focus mainly on supply-side characteristics; rely on administrative records or standard labour force surveys as data sources; and include indicators for which data are now routinely available. Indicators in the second generation build on those in the first generation to provide a more nuanced picture. Thus, they broaden the focus to include: demand-side factors (e.g., composition of the economy, growth rate, wages trends, returns to education and training, time to fill a vacancy, etc.); the use of direct measures of the literacy and numeracy skills of youth who are on the cusp of entering the workforce (e.g. the OECD's PISA test scores for 15 year-olds); and data from new sources, including the World Bank's Enterprise Surveys.

As interest in skills development continues to grow, there is a corresponding intensification of interest in what might be called third generation skills indicators (see Box 2), ones that are indeed closely aligned with the concepts reflected in Figure 1 above. Building on the first two generations of indicators, the defining features of the new indicators include the following: a broader focus on the match between jobs and skills; measurement of the skills possessed by the stock of the workforce, not just those about to enter it; and reliance on new survey instruments designed specifically to generate the new data. To generate this type of information, the OECD has carried out a major international survey of adult skills in 24 mainly developed countries. Based on this experience, the World Bank has carried out similar surveys in 16 developing countries, including a few LICs. The results from this experience will provide an important basis to assess the cost, usefulness and relevance of the greater depth in internationally comparable skills data that are offered by the new instruments, especially in the context of LICs.

Box 2. International surveys of adult skills: recent developments

OECD Programme for the International Assessment of Adult Competencies (PIAAC)

Work on international comparative assessments of the foundation cognitive skills of the adult population began with the International Adult Literacy Survey (IALS) in the 1990s and the Adult Literacy and Life Skills Survey (ALL) of the early 2000s. PIAAC builds on and extends this work through the OECD Survey of Adult Skills. This survey includes a direct assessment of cognitive skills and measures of skills used at work. Its hallmark is the use of standardised survey instruments and data collection protocols to generate high quality, comparable cross-country data on the skills and competencies required by individuals and nations to prosper. The data are expected to help governments understand better how education and training systems can nurture these skills. It was carried out in 2011-2012 in 24 mostly developed countries. The main results will become available in October 2013. A second wave is being carried out which will cover a wider range of countries in terms of economic development.

The UIS Literacy Assessment Monitoring Programme (LAMP)

LAMP consists of a direct assessment of adult literacy skills in developing countries. Like PIAAC, it has been developed learning from the IALS and ALL experiences, but it pays particular attention to measuring reading and pre-reading skills in European and non-European languages using several scripts. Instead of classifying people as either literate or illiterate, LAMP shows reading and numeracy performance levels. Those in the lower end are not treated as a homogeneous group but as different “classes” in order to better inform policy and programme interventions that should be implemented in order to improve the literacy skills in each class. Since LAMP’s main objective is to inform policy at national level, participating countries do not need to conduct activities under a common schedule and the assessment’s implementation depends on each country’s needs. The field test has been completed for El Salvador, Morocco, Niger, and Viet Nam, as well as Jordan, Mongolia, Palestine and Paraguay, and these last four countries have also completed their main assessments, for which a report will be released in mid-2013. In addition, the field test is currently in progress for Afghanistan and Lao PDR.

World Bank’s Skills toward Employment and Productivity (STEP) Skills Measurement Study

The World Bank’s STEP measurement study was launched in 2010 with the aim of enhancing the information available to policy makers regarding the level and distribution of skills relevant to the labour market in the adult populations of developing countries. The study includes both a survey administered to individuals and an employer survey. The individual survey consists of three modules on cognitive skills, technical skills and socio-emotional skills, including a direct assessment of reading literacy based on the OECD Survey of Adult Skills instruments. Eight countries were involved in the first wave of data collection, which took place in 2011: Bolivia, Colombia, Ghana, Laos, Sri Lanka, Ukraine, Vietnam, and Yunnan province of China. The second wave, which took place in 2012/13, involved five countries, including: Armenia, Azerbaijan, Georgia, Kenya and Macedonia.

There are important differences between STEP and the OECD Survey of Adult Skills. First, the target population for STEP was not the resident adult population of the participating country or region as a whole but the population of urban centres. Second, although similar technical standards for the literacy assessment were followed in both surveys, the operational standards applied (including the quality-assurance and control processes) followed protocols established separately by each institution. Both these factors need to be taken into account when comparing results from STEP and the OECD survey.

4. An inventory of data availability

In order to identify more precisely the extent of the gaps in country coverage for each indicator selected in Table 1, a detailed inventory or stock-take of data availability was carried out. This exercise was conducted for all countries, irrespective of their levels of per capita income, and not just for the LICs. This allows for comparisons of data availability across country groupings by level of development, and provides a first indication of the extent to which it will be possible to eventually compare the values of the skills indicators in LICs with those in more economically developed countries.

The inventory covers the databases of the relevant international organisations, including the ILO, OECD, UNESCO Institute for Statistics, WHO and the World Bank as well as Eurostat and other sources of international data on skills.¹ The full list of data sources covered by the inventory is shown in Table 2. For each country and indicator, it was established whether data was available for a recent year (i.e. 2005 or later). This meant examining data availability for 214 countries and 68 indicators (in some cases, the same underlying data could be used for several indicators and so slightly fewer data series needed to be examined).

Table 2. List of data sources covered by the inventory

Source	Weblink
Eurostat statistics database (ESD)	http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database
ILO Key Indicators of the Labour Market (KILM)	www.ilo.org/kilm
OECD Education at a Glance (EAG)	http://www.oecd.org/edu/eag2012.htm
OECD Labour Market Statistics (LMS)	http://www.oecd.org/els/emp/onlineoecdemploymentdatabase.htm
CONFEMEN Programme for the Analysis of Education Systems in francophone countries (PASEC)	http://www.confemen.org/le-pasec
Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ)	http://www.sacmeq.org
UCW and ILO YouthSTATS	http://www.youthstatistics.org
UNESCO Institute for Statistics (UIS) Data Centre	http://stats.uis.unesco.org
UN Department of Economic and Social Affairs, Population Division (UNPOP)	http://esa.un.org/unpd/wpp/index.htm
USAID Demographic and Health Surveys (DHS)	http://www.measuredhs.com
WHO Global Health Observatory (GHO) data repository	http://www.who.int/gho/database
World Bank Indicators (WBI)	http://data.worldbank.org/indicator
World Bank Enterprise Surveys (WBES)	http://www.enterprisesurveys.org/CustomQuery

1. The inventory of data availability based on the Data Centre of the UNESCO Institute for Statistics was kindly supplied by Hiromichi Katayama (UNESCO Institute for Statistics).

A summary of the results of this inventory exercise is presented in Figure 2.² Countries have been grouped according to the World Bank classification of countries by level of per capita income in 2011. There are four country groupings: low income countries, lower middle income countries, upper middle income countries and high income countries. Figure 2 thus shows for each indicator the percentage of all countries in each group for which data is available for a recent year. The colour of the bars – green, orange and red – indicates whether the data availability is considered to be good, fair or poor, respectively. More precisely, green means that the indicator is potentially available in at least 50% of the countries in each country group. Orange corresponds to availability of 25% or more but less than 50%, and red means that the indicator is available in less than 25% of countries in each group. In some of the country groupings, especially the high-income group, there are a number of very small countries with weak statistical systems, therefore a weighted average of data availability is also presented based on the population of each country.

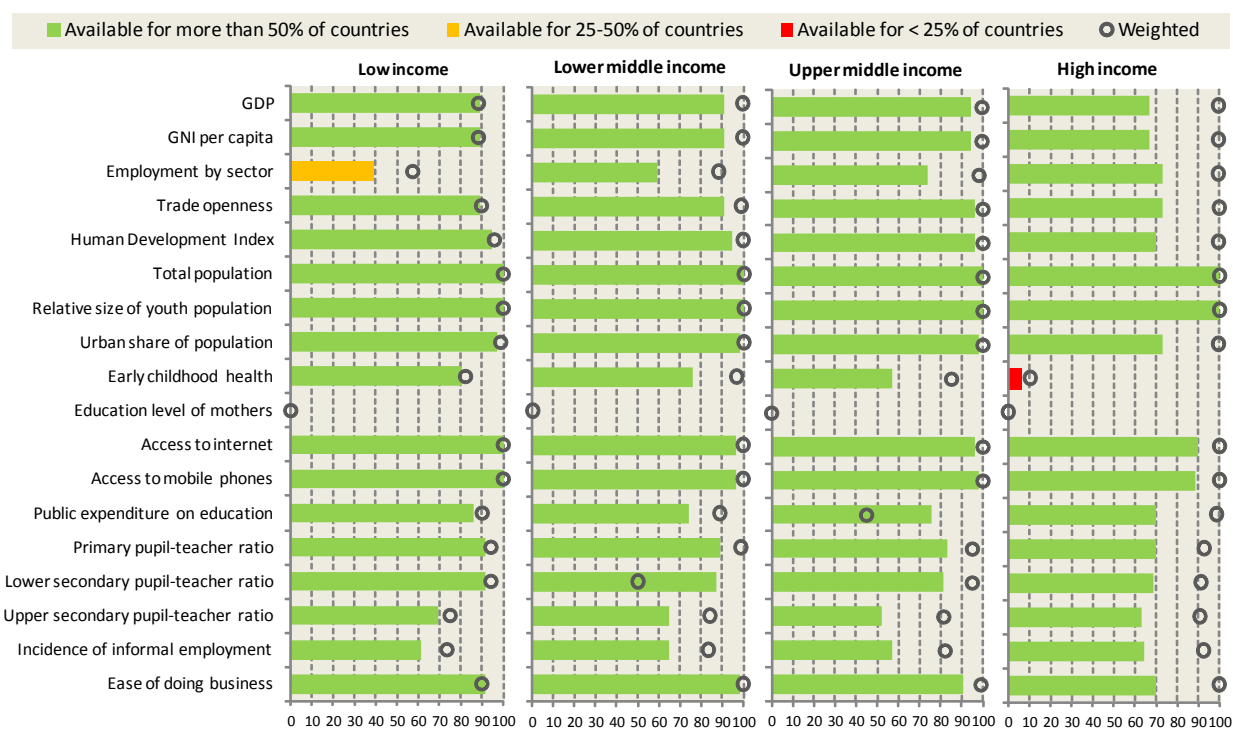
The general picture that emerges from this inventory is that, for most indicators, data is available for the majority of countries in the upper middle income and high income countries (especially once account is taken of population size). However, data availability is patchier for the low income and lower middle income countries. While it is generally quite good for the indicators in the domains of contextual factors and skills acquisition, it becomes poorer in the areas of skill requirements, matching and outcomes. The most notable holes in data availability concern the indicators of earnings by education and occupation where there is a total absence for lower income countries and only modest availability for higher income countries. Other indicators where there is also a notable absence of data available concern the education level of young mothers, training participation of adults, hard-to-fill vacancies and the supplementary indicators of skill requirements.

However, it may be possible to fill in some of these holes by going back to the primary data sources to obtain the data required to construct the indicators. This may be the case for those indicators where the underlying source is likely to be labour force surveys or could be obtained from population censuses. More generally, as discussed below, the construction and maintenance of a database with these skills indicators will need to involve a considerable effort of capacity building to strengthen statistical systems in LICs in order to provide the data required to construct some of these indicators. In particular, this will require reaching agreement among the different agencies and bodies assisting countries in implementing household and enterprise surveys (including labour force surveys) on the key items that need to be included in these surveys to obtain the data required to construct the various skill indicators identified in this report.

2. The complete inventory by indicator for each individual country and is available on request from the author.

Figure 2. Availability of indicators in each country grouping as of January 2013^a

A. Context indicators



B. Indicators of skill acquisition

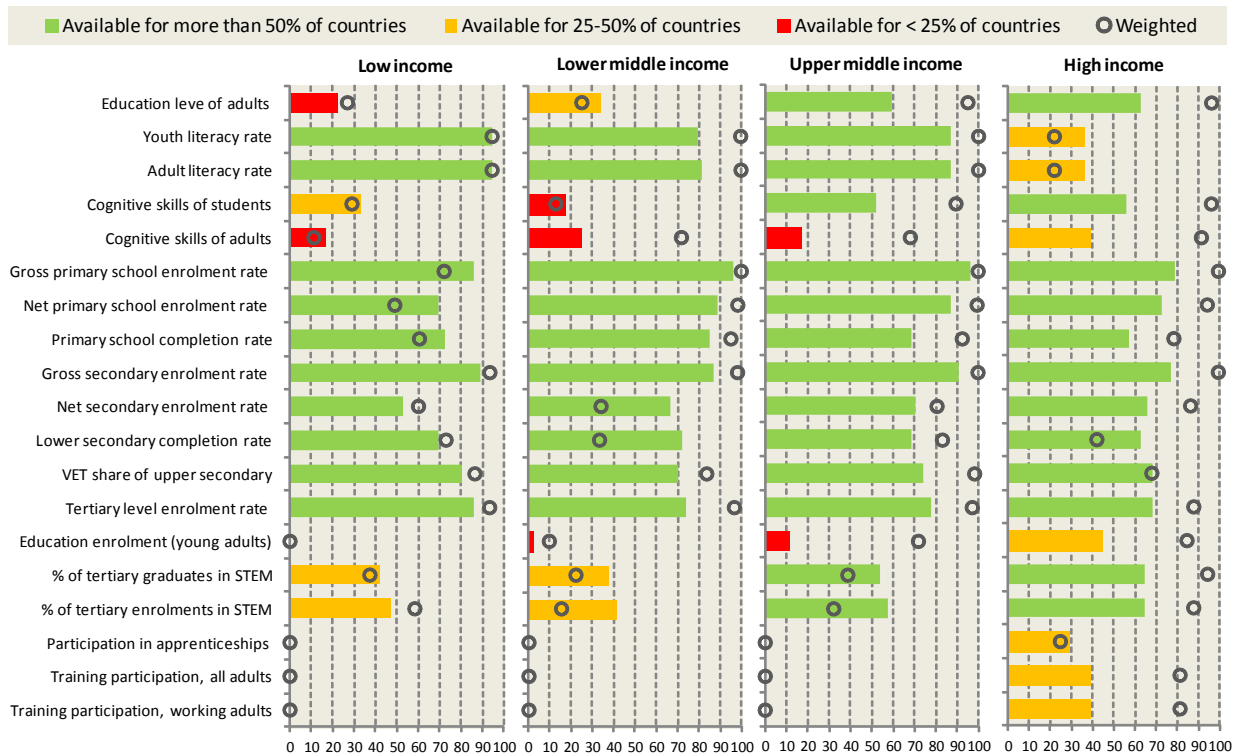
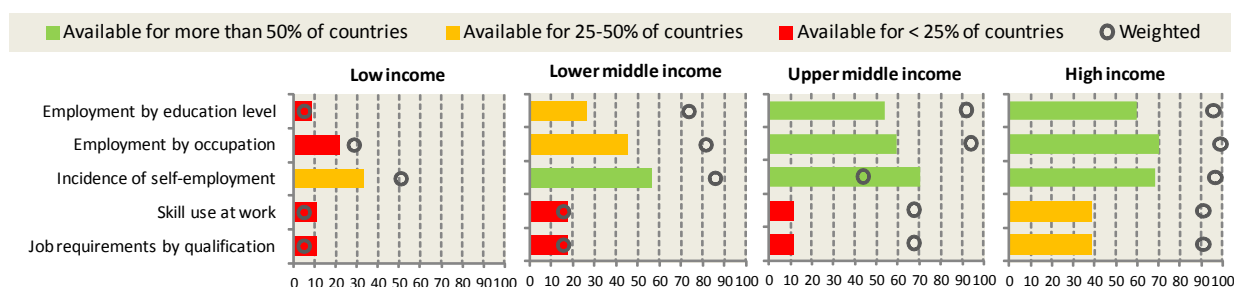
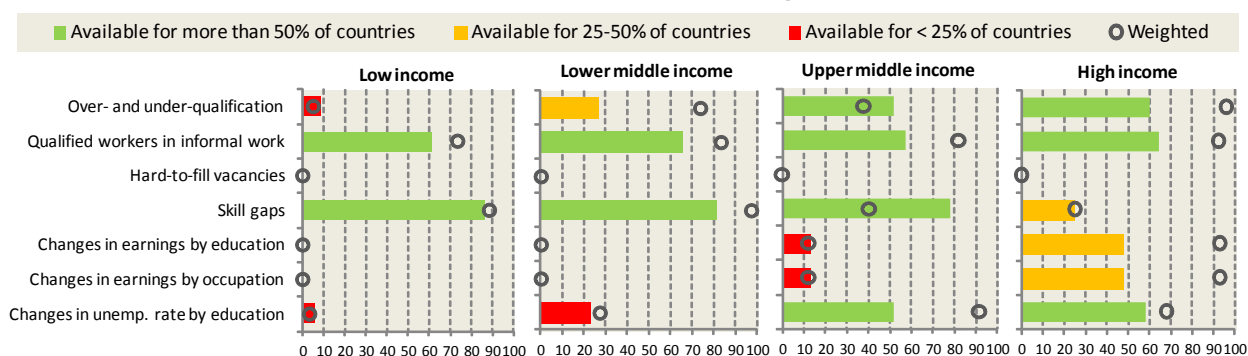


Figure 2. Availability of indicators in each country grouping^a (cont.)

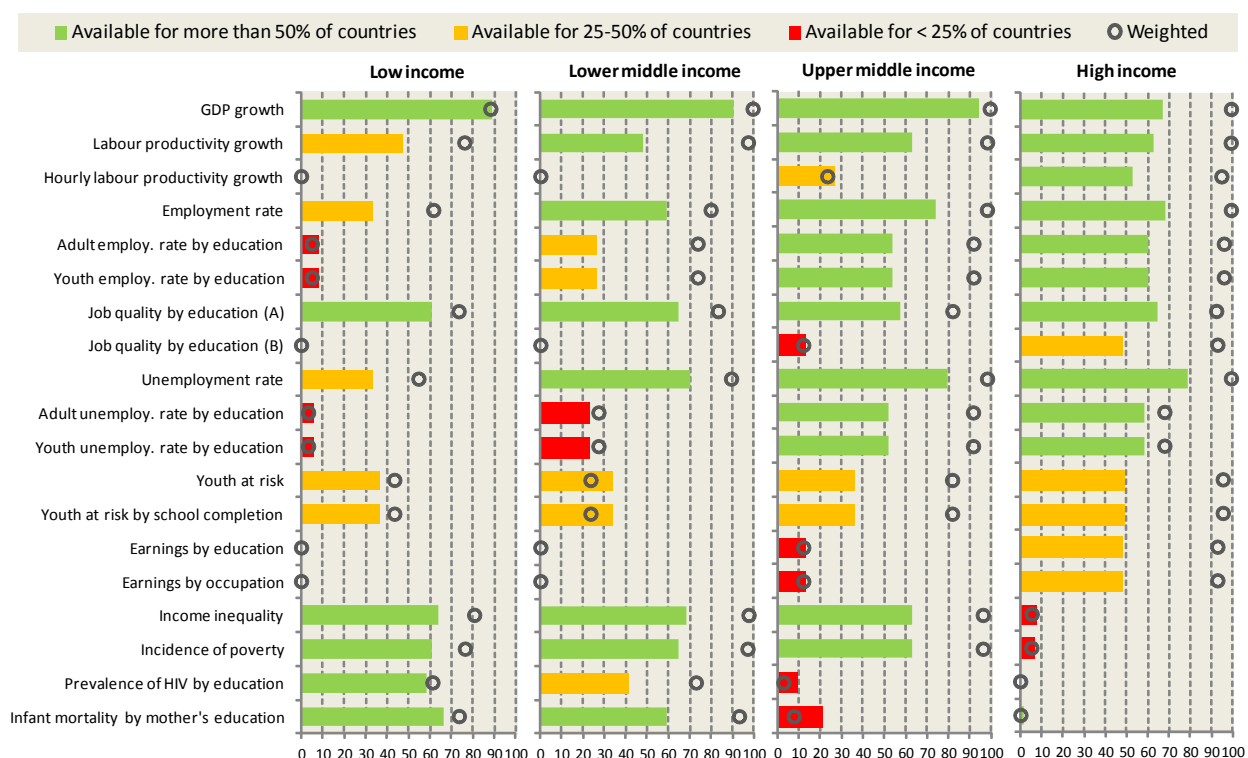
C. Indicators of skill requirements



D. Indicators of matching



E. Indicators of economic and social outcomes



a) For each indicator, the percentage is shown of the total number of countries in each country grouping for which data are available since at least 2005. The weighted figures refer to the percentage of the total population in each country grouping covered by the population in the countries for which data are available.

Source: OECD calculations.

5. Next steps

The next steps in the project can be divided into three main tasks. First, a *database of internationally comparable skills indicators* will be established, subject to funding being available, and which would include support for *further capacity building* of the collection and analysis of statistical information on skills development. Second, a *final report* on the database of comparable indicators will be prepared by late 2014, including recommendations for further development and capacity-building work. Third, as possible follow-up work, *recommendations on good practice* in collecting information on skills using various types of surveys could be developed, including on the use of more nationally-, regionally- and sectoral-specific indicators.

Database of internationally comparable skills indicators and further capacity building

The ultimate objective of this project is to construct and put into use a database of the internationally comparable skills indicators that have been identified. This will require reaching agreement among the relevant international organisations involved on the process of establishing, maintaining and developing the database. There are various possible options for how this could be done. For instance, one of the international organisations could take charge of the development and maintenance of the database or it could be set up jointly by several organisations, possibly as part of the global Knowledge Sharing Platform (KSP) on skills for employment that is being developed as part of the HRD pillar. Whichever option is chosen, the most important requirement would be to maintain the cross-sectoral approach involving indicators covering the fields of education and training, employment and economic and social development. As discussed further below, additional funding for this work would also be required.

The results of the inventory exercise (see Section 4) identified a number of large gaps in data availability especially for LICs. Therefore, in addition to establishing the database, support would need to be provided for building the capacity in these countries to develop and implement the necessary statistical instruments to collect and analyse these data. Again, this could consist of a mix of possible forms of collaboration involving the relevant international organisations as well as South-South cooperation, bilateral assistance between countries, etc. Tanzania provides a good country example of where this type of capacity building exercise has taken place in the context of broader efforts to enhance the capability of a national statistical agency (see Box 3).

This support for capacity building could also consist of providing advice on how to use the skills indicators for skills policy development, monitoring and evaluation. It would also be useful to examine the feasibility, costs and benefits of implementing “third-generation” surveys of adult skills more widely in LICs (see Section 3).

Both the development of the database and the associated support required for capacity building will require additional funding if they are to be carried out. For the sake of providing an estimate of the likely costs involved, the following assumptions were made:

- The database would be established and maintained by the OECD, but as a joint initiative of the relevant international organisations (ILO, OECD, UNESCO, World Bank) either through the IAG-TVET or as part of the KSP on skills, and with full and free access to all users.
- Capacity-building efforts linked to the database would also be jointly carried out by the same international organisations and would involve some travel to LICs.
- The database would cover all countries and would be updated on an annual basis.

- In the first year of operation (2014), one analyst and one statistician on a full-time, full-year basis would be required to establish the database and for the associated capacity-building work. For subsequent years, only 6 months of one full-time analyst would be required plus one full-time, full-year statistician.
- Some additional senior management time would also be required.

Based on these assumptions, it is estimated that the total costs would be 330K € in 2014 and around 200K € in each subsequent year (in 2014 prices).

Final report on the database

Subject to funding being available to construct the database, a final report will be prepared by the end of 2014. This would include the full documentation of the sources and definitions of the indicators in the database and how to access and use the database. It would also include recommendations for further work to develop the database further.

Box 3. The recent initiative by Tanzania to improve its national statistical system

Tanzania is a good example of coordinated action by donors to support a national strategy to strengthen national statistical capacity to generate routine, timely and useful data for policy development. Many of the skills-related indicators proposed in this paper can be derived from the surveys and other data collection activities under the Tanzania Statistical Master Plan (TSMP) which the Cabinet of Ministers adopted in June 2010. The Plan's estimated cost of \$64.4 million during FY12-16 is being financed via pooled arrangements initially involving the World Bank and the governments of Canada and of the United Kingdom and through parallel funding from other development partners. The combined effort seeks to strengthen staff capability, provide equipment and support a program of reforms to the legal, institutional and organisational arrangements so as to enable the National Bureau of Statistics (NBS), the country's main statistical agency, to deliver, as mandated by law, a core statistical program under the supervision of an independent Board of Directors.

NBS's core program focuses on: a) the centennial population and housing census; b) updating and maintaining the master sampling frame for household-based surveys; c) updating and maintaining the Central Register of Establishments, which supplies the master sampling frame for enterprise-based surveys; d) scaling-up cartographic data in the Geographic Information System; e) compiling and disseminating national accounts aggregates and the monthly consumer price index; and f) implementing key surveys such as the Employment and Earnings Survey and the Annual Survey of Industrial Production. Under the TSMP, the NBS expects to minimise the 3-4 year delays in recent years in the production of its flagship statistical products. Aside from the core program, the NBS will continue to conduct household-based surveys; and it intends to strengthen the collection and production of statistics from administrative sources (e.g., the Health Management Information System, the Education Management Information System and the Civil Registration System). The TSMP will align incentives toward enhancing the timeliness and quality of data and reports from the core statistical program while continuing to boost coordination, consistency, and accuracy of the various household surveys and administrative data sources.

Although still new, the TSMP has already produced early results in the form of the National Data Archive (NADA) which was launched in November 2010 as a web-based system hosted by NBS for archiving, documenting and disseminating survey data and reports. Following a simple, automated online registration process, visitors to the soon-to-be-activated website (<http://www.nbs.go.tz/>) can browse, search, apply for access, and download various Public-Use Files containing survey data. The following nine datasets from household surveys that contain many of the skills-related indicators proposed in this report are expected to be available initially: a) the 2009 **National Panel Survey**; b) the 2007 and 2001 **Household Budget Surveys**; c) the 2007/08 and 2003/04 **Tanzania HIV/AIDS-Malaria Indicator Surveys**; d) the 2006 and 2001 **Integrated Labor Force Surveys**; e) the 2004/05 **Demographic and Health Survey**; and f) the 2004/05 **Agriculture Sample Census**. Additional skills-related indicators from the World Bank's data sources for Tanzania, along with those for other countries, can also be found under the World Bank's Open Data Initiative at data.worldbank.org.

Recommendations on good practice

Constructing a set of internationally comparable skills for LICs is not easy because of constraints on data availability as identified in the previous section. However, two key data sources are potentially available in most LICs which could be used to construct many of the “core” indicators identified above. These are labour force surveys and health surveys. Employer surveys are also another key source for information on skills utilisation and skill gaps and shortages. Therefore, as a possible follow-up activity, which would complement the future development of the database and the associated capacity-building work, a list of key survey questions relating to skills could be established which should be systematically included in these surveys. This could, for instance, be overseen by the IAG-TVET.

In addition, for the purpose of national analysis and identification of skill gaps (and as part of the development of national skill strategies as proposed under Action 2 of the G20 HRD pillar), a number of other potential national (or even regional) indicators may also need to be developed in each country that would not necessarily be directly comparable across countries. This could include more qualitative information on governance and funding arrangements and the institutional set-up in each country. Therefore, as part of the follow-up activity proposed above, some general principles or guidelines could be identified concerning the choice of indicators to develop at a national, local or sectoral level and the type of analysis that could be carried out using these indicators.

Conclusions

Skills are key drivers of prosperity and well-being. But understanding where the best investments in skills should be made requires good labour market information covering a range of domains. In this report a set of indicators of skills is proposed for LICs which should help them to guide their skill development policies and to benchmark their performance against other countries across the development spectrum. The next step will be to build a database with these indicators. However, this is not an easy task as it would need to draw on several international data sources and in some instances require going back to primary national sources to collect the necessary information. Moreover, large gaps in country coverage, particular for the LICs, would still remain for some indicators.

Therefore, much further work is still required to strengthen capacity building in the collection and analysis of information on skill formation, needs and utilisation. This should build on existing initiatives for international cooperation in this area (including the cooperation as part of the work on the HRD pillar and by the IAG-TVET), but it would also require sufficient funding to be successful. Nevertheless, the expected benefits of improved information systems to guide skills development policies are likely to be substantial for developing countries in terms of leading to greater productivity and better employment and social outcomes.

ANNEX A: PROPOSED INDICATORS FOR THE DATABASE

Based on the conceptual framework and the inventory of data availability that was carried out, a proposed set of indicators has been identified in the tables below for each of the five broad indicator domains. For each separate indicator, a brief description is given of its definition, the rationale for its inclusion, sources for the underlying data and, finally, the coverage of LICs as of January 2013. Based on data availability for at least one year since 2005, coverage of the LICs is classified as: good, if data is available for at least 50% of these countries; fair, if data is available for 25% or more but less than 50% of these countries; and poor, if data is available for less than 25% of these countries. A distinction has been made between “core” indicators, based on their relevance and immediate availability, and “supplementary” indicators that ideally should be included but for lack of data availability.

I. Contextual factors (C)

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>1. Aggregate economic and social conditions</i>				
C1.1. GDP	Gross Domestic Product	Provides a measure of the overall economic size of each country and the potential resources available for skills development.	WBI	Good
C1.2. GNI per capita	Ratio of Gross National Income (GNI), expressed in a common currency (using PPPs), to the total population.	Provides a measure of the level of economic development of each country and of the potential constraints on the resources that can be devoted to skills development. It provides a useful control for benchmarking the performance of countries.	WBI	Good
C1.3. Employment shares by sector	Shares of total employment in agriculture, mining and construction, industry (manufacturing and utilities) and service sectors.	Provides an economy-wide measure of the general type and level of skill demands for each country.	KILM	Fair
C1.4. Trade openness	Ratio of imports plus exports to GDP.	Provides a summary measure of globalisation which may have an impact on skill demands.	WBI	Good
C1.5. Human Development Index	Composite index of life expectancy, educational attainment and income.	Provides a summary measure of the overall level of social development of each country. It provides a useful control for benchmarking the performance of countries.	HDR	Good
<i>2. Demographic</i>				
C2.1.	Total population	Provides a measure of the overall demographic size of each country.	UNPOP	Good
C2.2. Relative size of youth population	Ratio of the youth population (aged 15-24) to the working-age population (15-64).	Provides a measure of the size of the potential group of new entrants to the labour market relative to the whole working-age population and the scale of the challenge facing each country's education and training system to provide youth with appropriate skills.	UNPOP	Good
C2.3. Share of population living in urban areas	Share of the total population living in urban areas.	Provides an indication of the concentration of demand for skills and accessibility to training services.	WBI	Good
<i>3. Early childhood development</i>				
C3.1. Early childhood health	Proportion of children aged 0-59 months who are below minus two standard deviations from WHO-standard median weight.	There is a range of evidence pointing to the importance of good infant health for subsequent cognitive development in LICs.	WBI	Good

Indicator	Measure	Rationale	Source	Coverage of LICs
C3.2. Educational attainment of women with young children.	Proportion of women with children under 5 years of age by broad ISCED level.	Level of education of mother represents proxy for cognitive stimulation offered by household which has been linked to subsequent cognitive development of children.	Needs to be obtained from primary sources (labour force surveys, censuses or DHS).	Poor
<i>4. Technology use and work organisation</i>				
C4.1. Access to internet	Number of internet user per 100 of the population.	Provides a proxy measure of the availability of IT technology and the potential demand for, and supply of, IT skills. May also indicate ease of carrying out job search and achieving better skill matches or the potential for developing and utilising entrepreneurial skills.	WBI	Good
C4.2. Access to mobile phones	Number of mobile-phone users per 100 of the population.	Provides a proxy measure the availability of communications technology and the potential demand for, and supply of, IT skills. May also indicate ease of carrying out job search and achieving better skill matches or the potential for developing and utilising entrepreneurial skills.	WBI	Good
<i>5. Education and labour market settings</i>				
C5.1. Public expenditure on education	Public expenditure on education as a percentage of GDP.	Provides a measure of public investment in human capital relative to the total resources available in the economy.	UIS & WBI	Good
C5.2a. Pupil-teacher ratio (primary)	Ratio of the number of pupils to the number of teachers in primary education.	Provides a proxy measure of class size and a crude measure of education quality.	UIS	Good
C5.2a. Pupil-teacher ratio (lower secondary)	Ratio of the number of pupils to the number of teachers in lower secondary education.	Provides a proxy measure of class size and a crude measure of education quality.	UIS	Good
C5.2a. Pupil-teacher ratio (upper secondary)	Ratio of the number of pupils to the number of teachers in upper secondary education.	Provides a proxy measure of class size and a crude measure of education quality.	UIS	Good
C5.3. Employment in the informal sector	Share of total employment in the informal sector.	Provides a measure of the size of the informal sector and the potential difficulties workers may face in getting access to collectively organised training.	KILM	Good
C5.4. Ease of doing business	World Bank's composite index of the ease of doing business.	More restrictive rules for setting up and running businesses may stifle job creation and better utilisation of human capital.	WBI	Good

II. Skill acquisition (S)

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>1. Stock of human capital</i>				
S1.1. Educational attainment of the adult population	Distribution of population aged 25 years and above by highest (ISCED) level of education attained	Provides a measure of the stock of skills (as proxied by educational attainment) that are potentially available to employers and which are a key driver of economic growth.	UIS	Poor
S1.2a. Youth literacy rate	Proportion of youth (15-24) that is literate	Provides a measure of basic literacy skills or their absence that complements the indicator of educational attainment, <i>i.e.</i> some individuals may have had some schooling but still be illiterate while others may have had no schooling but may be literate. Basic literacy is an important pre-requisite for many types of further learning.	UIS	Good
S1.2b. Adult literacy rate	Proportion of population aged 15 and over that is literate	Provides a measure of basic literacy skills or their absence that complements the indicator of educational attainment, <i>i.e.</i> some individuals may have had some schooling but still be illiterate while others may have had no schooling but may be literate. Basic literacy is an important pre-requisite for many types of further learning.	UIS	Good
S1.S1. Supplementary indicator: Cognitive skills of students	Mean literacy score of students aged 15 years old	Provides a more direct measure of competence in key skills than educational attainment as well as a measure of the quality of education.	OECD/SACMEQ/PASEC	Fair
S1.S2. Supplementary indicator: Cognitive skills of adults	Mean literacy score of adult population	Provides a more direct measure of competence in key skills than educational attainment as well as a measure of the quality of education.	OECD/STEP/LAMP	Poor
<i>2. Skill formation</i>				
S2.1a. Gross primary school enrolment rate	Gross enrolment rate in primary education by gender.	Participation in primary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good
S2.1b. Net primary school enrolment rate	Net enrolment rate in primary education by gender.	Participation in primary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good
S2.2. Primary school completion rate	Gross enrolment rate in final year of primary education by gender.	Completion of primary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good
S2.3a. Gross secondary education enrolment rate	Gross enrolment rate in secondary education by gender.	Participation in secondary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good

Indicator	Measure	Rationale	Source	Coverage of LICs
S2.3b. Net secondary education enrolment rate	Net enrolment rate in secondary education by gender.	Participation in secondary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good
S2.4. Lower secondary education completion rate	Proportion of students in the first grade of lower secondary education who are expected to reach the last grade.	Completion of lower secondary education provides an indicator of the acquisition of basic skills and is typically a precondition for going on to higher levels of education.	UIS	Good
S2.5. Share of vocational programmes in upper secondary education	Proportion of all enrolments in upper secondary education that are in vocational programmes.	Indicates the possibility for students to obtain moiré vocationally-specific skills.	UIS	Good
S2.6a. Tertiary level enrolment rate	Gross enrolment rate in tertiary education by gender.	Participation in tertiary education provides an indicator of the acquisition of higher-level of skills and the potential future supply of workers with these skills.	UIS	Good
S2.6b. Education enrolment rate of young adults	Net enrolment rate in all forms of education for population aged 20-29) by gender.	Participation in education of older youth provides an indicator of the acquisition of higher-level skills and the potential future supply of workers with these skills.	Needs to be obtained from primary sources (labour force surveys).	Poor
S2.7a. Share of tertiary graduates in STEM subjects	Share of all graduating tertiary students who graduated in the (ISCED) field of science and technology.	Provides an indicator of the focus of the tertiary education system on a key area of skills demand which drives economic growth as well as on the potential supply of new labour market entrants with science and technology skills.	UIS	Fair
S2.7b. Share of tertiary enrolments in STEM subjects	Share of all enrolled tertiary students who are enrolled in the (ISCED) field of science and technology.	Provides an indicator of the focus of the tertiary education system on a key area of skills demand which drives economic growth as well as on the potential supply of new labour market entrants with science and technology skills.	UIS	Fair
S2.S1. Supplementary indicator: Participation in apprenticeships	Proportion of youths (15-24) that are apprentices (either in modern or traditional apprenticeships).	Provides a measure of an important source of learning and skills formation that is not captured by the other proposed indicators of participation in education and training.	Needs to be obtained from primary sources (labour force surveys, censuses or STWS).	Poor
S2.S2a. Supplementary indicator: Participation in education and training by adults	Proportion of adult population (25-64) by gender who participated in education and training in the last quarter/year.	Provides a measure of lifelong learning as well an indicator of and important supply of additional skills in some countries.	Needs to be obtained from primary sources (labour force surveys).	Poor
S2.S2b. Supplementary indicator: Participation in education and training by working adults	Proportion of working adult population (25-64) by gender who participated in education and training in the last quarter/year.	Provides a measure of lifelong learning as well an indicator of and important supply of additional skills in some countries.	Needs to be obtained from primary sources (labour force surveys).	Poor

III. Skill requirements (D)

Indicator	Measure	Rationale	Source	Coverage of LICs
D1.1. Educational attainment of employed persons	Proportion of all employed persons by gender at each level of ISCED (possibly with some regrouping). Time-series where available.	Provides a measure of the demand for skills (as proxied by educational attainment) and, to the extent there are time-series data available, changes in that demand over time. It is a proxy measure for total demand since there be unmet demand for skills and some degree of over-qualification (<i>i.e.</i> some workers may have higher qualifications than those required in their jobs).	KILM	Poor
D1.2. Employment shares by occupation	Proportion of all employed persons by ISCO occupation (1 or 2-digit). Time-series where available.	Provides a measure of the relative demand for different skill groups (as proxied by occupation) and, to the extent there are time-series data available, changes in that demand over time.	KILM	Poor
D1.3. Incidence of self-employment	Share of self-employment in total employment.	Provides a measure of need for entrepreneurial skills.	KILM	Fair
Supplementary set of indicators: D1.S1. Job-task measures of skill use at work	Calculated as the proportion of workers performing various job tasks (either in terms of frequency or at different levels of complexity). These job tasks would cover: reading, writing, numeracy, use of IT, communicating, teamwork, learning new things, physical work and manual dexterity.	These job-task indicators provide more direct measures of broad or generic skills that are required by employers than do educational qualifications of workers.	OECD/STEP	Poor
Supplementary set of indicators: D1.S2. Job requirements by qualification	Proportion of workers by the qualification (education level) that their job requires -- no qualification, low (ISCED 3 or below), high (ISCED 5 and above).	Provides a more direct measure of the demand for skills (as proxied by education level) than obtained from measuring the qualifications of the workforce.	OECD/STEP	Poor

IV. Matching (M)

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>1. Qualifications mismatch</i>				
M1.1. Proportion of workers who are overqualified or underqualified	Proportion of workers whose educational attainment level is higher (lower) than the level required in their job (as measured based on the modal education level for all workers in the same occupation).	Provides an indicator of the extent of qualifications mismatch.	Needs to be obtained from primary sources (labour force surveys or censuses).	Poor. Assumes same data availability as for the joint availability of the skill requirements indicators for employment by education and occupation.
M1.2. Proportion of qualified workers working in the informal sector	Proportion of all workers (aged 20-29, 15+) with a completed secondary or tertiary qualification who are working in the informal sector.	Provides an indicator of the difficulties more skilled workers face using their skills in the formal sector.	Needs to be obtained from primary sources (labour force surveys or censuses).	Good. Assumes same data availability as for the context indicator on informal employment.
Supplementary indicator: M1.S1. Hard-to-fill vacancies (by occupation)	Proportion of all vacancies that are hard-to-fill. (ideally by ISCO 1-digit occupation).	Provides an indicator of skill shortages or unmet demand for skills, although could also reflect firms not offering the going wage or poor working conditions.	Needs to be obtained from primary sources (administrative data or employer surveys).	Poor
Supplementary indicator: M1.S2. Skill gaps	Percent of firms identifying an inadequately educated workforce as a major constraint.	Provides an indicator of skill gaps or unmet demand for skills, although could also reflect firms not offering the going wage or not offering adequate training.	WBES	Good

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>2. Indirect measures of changes in match between skills supply and demand</i>				
<i>M2.1. Changes in earnings by education and gender</i>	Change over time in the ratio of mean hourly (or full-time equivalent) earnings by broad ISCED level and gender relative to hourly (or full-time equivalent) earnings for all workers by gender.	Provides an indicator of the change of relative demand for labour with different levels of education.	Partially available for richer countries through OECD/Eurostat	Poor
<i>M2.2. Changes in earnings by occupation and gender</i>	Change over time in the ratio of mean hourly (or full-time equivalent) earnings by occupation (ISCO 1-digit) and gender relative to hourly (or full-time equivalent) earnings for all workers by gender.	Provides an indicator of the change of relative demand for labour across occupational groups.	Partially available for richer countries through OECD/Eurostat	Poor
<i>M2.3. Changes in unemployment rate by education and gender</i>	Change over time in the ratio of the unemployment rate by broad ISCED level and gender relative to the overall unemployment rate by gender.	Provides an indicator of the change of relative demand for labour with different levels of education.	KILM	Poor

V. Outcomes (O)

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>1. Aggregate economic outcomes</i>				
01.1. GDP growth	Time series of annual growth in GDP (or average annual rate over past 10 years).	Provides an overall indicator of aggregate economic performance.	WBI	Good
01.2a. Labour productivity	Ratio of GDP per employed person and annual growth rate (either as a time series or average annual rate over past 10 years).	Provides an overall indicator of labour productivity which reflects human (and non-human) capital utilisation.	KILM	Fair
01.2b. Hourly labour productivity	Ratio of GDP per hour worked and annual growth rate (either as a time series or average annual rate over past 10 years).	Provides an overall indicator of labour productivity which reflects human (and non-human) capital utilisation.	KILM	Poor
<i>2. Employment and unemployment</i>				
02.1a. Employment rate by education and gender	Employed persons aged 15 and over at each broad ISCED level as a proportion of the population aged 15 and over. Time-series where available.	Provides a measure of the impact of education on the probability of being in employment.	KILM	Fair
02.1b. Employment rate by education and gender	Employed persons aged 15 and over at each broad ISCED level as a proportion of the population aged 15 and over. Time-series where available.	Provides a measure of the impact of education on the probability of being in employment.	KILM	Fair
02.1c. Employment rate of youth by education and gender	Employed youth at each broad ISCED level as a proportion of the population for the age groups 15-19, 20-24, 25-29. Time-series where available.	Provides a measure of the impact of education on the probability of youth being in employment as well as a measure of the school-to-work transitions of youth.	KILM	Poor
02.2a. Job quality by education (A)	For non-agricultural employment, persons in informal employment as a proportion of all persons employed by broad ISCED level.	Provides a measure of job quality by level of education.	Needs to be obtained from primary sources (labour force surveys or censuses).	Good. Assumes same availability as the joint data availability of employment by education and informal/formal status.
02.2b. Job quality by education (B)	Persons in temporary employment as a proportion of all persons employed by broad ISCED level.	Provides a measure of job quality by level of education.	Partially available for richer countries through OECD/Eurostat.	Poor

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>02.3a. Unemployment rate by gender</i>	Unemployment rate by gender for persons aged 15 and over. Time-series where available.	Provides a measure of the overall probability of being unemployed and the associated underutilisation of skills.	KILM	Fair
<i>02.3a. Unemployment rate of adults by education and gender</i>	Unemployment rate by gender for persons aged 25 and over at each broad ISCED level. Time-series where available.	Provides a measure of the impact of education on the probability of being unemployed.	KILM	Poor
<i>02.3c. Unemployment rate of youth by education and gender</i>	Unemployment rate for youth by gender at each broad ISCED level. Time-series where available.	Provides a measure of the impact of education on the probability of youth being unemployed as well as a measure of the school-to-work transitions of youth.	KILM	Poor
<i>02.4a. Youth at risk</i>	Youth (15-24) not in employment or education and training (NEET) as a proportion of the youth population (15-24).	Provides a measure of the youth population most at risk of being marginalised from the labour market and underutilising their skills.	YouthSTATS	Fair
<i>02.5b. Youth at risk by school completion</i>	Youth (15-24) not in employment or education and training (NEET) as a proportion of the youth population (15-24) by whether completed primary school or not.	Provides a measure of the youth population most at risk of being marginalised from the labour market and underutilising their skills by level of education.	YouthSTATS	Fair
<i>3. Earnings</i>				
<i>03.1. Earnings by education and gender</i>	Ratio of mean hourly (or full-time equivalent) earnings by gender and broad level of ISCED to hourly (or full-time equivalent) earnings for all workers by gender.	Provides an indicator of the returns to education.	Partially available for richer countries through OECD/Eurostat.	Poor
<i>03.2. Earnings by occupation and gender</i>	Ratio of mean hourly (or full-time equivalent) earnings by gender and occupation (ISCO 1-digit) to hourly (or full-time equivalent) earnings for all workers by gender.	Provides indicator of the returns to acquiring skills required in different occupations.	Partially available for richer countries through OECD/Eurostat.	Poor

Indicator	Measure	Rationale	Source	Coverage of LICs
<i>4. Social outcomes</i>				
<i>04.1a Income inequality</i>	Gini coefficient for household income distribution.	Provides an indicator of income inequality which may be related to inequalities in the access to education and learning and acquisitions of skills.	HDR	Good
<i>04.1b. Incidence of poverty</i>	Percentage of the population living on less than \$2.00 a day at 2005 international prices.	Provides an indicator of the incidence of poverty which may be related to inequalities in the access to education and learning and acquisitions of skills.	WBI	Good
<i>04.S1. Supplementary indicator: Prevalence of HIV by education</i>	Proportion of the adult population by gender (and rural/urban status) with HIV by broad ISCED level.	Provides an indicator of the links between education and health, although this is likely to be confounded by many other factors.	Needs to be extracted from DHS	Good
<i>04.S2. Supplementary indicator: Infant mortality rate by mother's education</i>	Infant mortality rate, i.e. number of deaths of babies under one year of age per 1,000 live births, by mother's broad ISCED level.	Provides an indicator of the links between education of mothers and infant mortality.	Needs to be extracted from DHS	Good

