IIEP PÔLE DE DAKAR PAPERS

Compilation of the main indicators for analysis of the relationship between education/training and employment

#1
Tools and methods

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Acronyms and Abbreviations

DHS	:	Demographic and health survey
EMIS	:	Education management and information system
ETS	:	Education and training system
ILO	:	International Labour Organization
INSEE	:	National Institute of Statistics and Economic Studies, France
ISCO	:	International Standard Classification of Occupations
MICS	:	Multiple indicator cluster survey
NEET	:	Not in education, employment or training
NSI	:	National statistical institute
OECD	:	Organisation for Economic Co-operation and Development
QWB	:	Unified questionnaire of basic well-being indicators
SDG	:	Sustainable development goals
SMIG	:	Guaranteed minimum inter-professional wage
SPC	:	Socio-professional category
SSA	:	Sub-Saharan Africa
TVET	:	Technical and vocational education and training

Production of this document

This Compilation of the Main Indicators for the Analysis of the Relationship between Education/ Training & Employment was elaborated with the aim to identify and summarize information about and definitions for indicators relating to the labor market and education sectors.

Foreword

On August 2, 2015 at the United Nations headquarters in New York, 193 countries approved and adopted 17 sustainable development goals (SDGs). SDG4, to "Ensure inclusive and quality education for all and promote lifelong learning" and SDG8 to "Promote inclusive and sustainable economic growth, employment and decent work for all" are those that directly call on education and training systems.

To best play their part in achieving these two goals, the education and training systems (ETS) of Sub-Saharan Africa (SSA) will be required to conduct ever more analysis on strengthening the links between education/training and employment. However, the ownership as well as the utilization of the data and indicators harnessed by this type of analysis by education sector players face several constraints. The main one relates to the great majority of education sector actors' misconception of the data and indicators used in the analysis of the links between education/training and employment, due to limited access to this specific information, whose production often falls on institutions beyond the education/training sector (NSIs, ministries of labor and so on). Furthermore, other factors exist that do not contribute to a better ownership of the indicators pertaining to employment by education sector players, such as: the plurality of indicators designed to measure employment issues, the complexity and technicality of some indicators for laypersons as well as the weakness of information systems on employment and training. Yet the mastery of the most common labor market terminology and indicators by education sector players is a prerequisite to pilot the education sector in light of labor market demand and the needs of the economy.

To contribute to remove these constraints, UNESCO's International Institute for Educational Planning's (IIEP) Pôle de Dakar has undertaken to elaborate a compendium of the most common indicators relating to the labor market in the context of Sub-Saharan African countries. The aim is to consolidate in a single publication, the smallest common multiple of indicators found in the majority of research and analysis carried out in SSA countries. Indeed, this compilation does not purport to provide a comprehensive review of the definitions of indicators relating to the sectors of the labor market and education, but rather to target the most important information and summarize it. The purpose and content of this document were determined on the basis of: (i) a review of recent literature on the topic; (ii) analytical work carried out by the IIEP's Pôle de Dakar; and (iii) experience gained through the technical assistance provided to Sub-Saharan African countries. The empirical dimension is therefore an essential pillar of the methodological approach, as several lessons have been learned on strengthening capacity while providing country support. In 2014, the International Labour Organization (ILO) reviewed its classification relating to employment and work. This updated information contributes to the definitions offered in this publication, and allow to better specify, for instance, the difference between the concepts of work and employment.

The compilation of indicators is organized into six parts. The first part (I) briefly presents some of the terminology most frequently used in education sector analysis in relation to the labor market. The five remaining parts successively present a selection of indicators commonly used to measure and describe: population, in relation to the labor market (II); employment status (III); the quality of ETS' labor supply (IV); the difficulties faced by ETS leavers in terms of professional integration (V); and the strength of the education/training and employment relationship (VI).

I. Main Terminology

Labor market: In economics, by analogy with the market for goods and services, the labor market designates the theoretical market where the supply and demand of work meet (or the supply and demand of labor). Demand for work is constituted by the needs of enterprises and the economy (factors of production), and supply of work by employees and jobseekers.

Working-age population: It is composed of the group of individuals of legal working age. The minimum legal age to work is 15 years in most countries; this age is also that prescribed by the International Labour Organization (ILO). The age of 65 years represents the one at which the vast majority of people withdraw from the labor market. In general, in the absence of any other indication, the estimation of labor market indicators is based on a reference population of individuals aged 15-64 years.

Work: Work refers to the activities carried out by people to produce goods and services destined to be consumed by others or by those that produced them. Three types of work can be differentiated between: (i) production work for personal consumption; (ii) work in employment; and (iii) voluntary work.

Unemployed working persons: People who carry out productive activities for personal consumption (for instance, domestic work or subsistence agriculture), or other types of unremunerated or voluntary work.

Employment: Employment is a set of tasks and functions that are or should be carried out by a single person for a given economic unit. Employment refers to the work performed in a transactional context, where remuneration is offered in exchange for work carried out, or for hours clocked, or for the profit derived from the sale or barter of goods and services. Remuneration can be in cash or in kind, and can be received during the same reference period as the work performed, or not. Employment also encompasses the work performed in exchange for training or hands-on professional experience to learn a job, a profession or specific tasks, without remuneration in cash or in kind. Unpaid employment refers to individuals who are business owners or employers, own-account workers, members of producers' cooperatives, or contributing family workers.

Informal employment: Practically speaking, people employed in enterprises and production units (formal or informal) and by households are considered to be in informal employment when at least one of the following three conditions is not fulfilled:
- the employer pays an insurance or social security allowance;
- remunerated sick leave is provided;
- remunerated annual leave, or compensation thereof, is provided.

Informal sector: The informal sector includes all informal enterprises and production units. A production unit (individual, family or other) is deemed to be informal if at least one of the following conditions is fulfilled (the criteria of an activity's informal nature) :
    (i) it is not incorporated (according to the compulsory requirements of its country, that may be the obtention of a statistical identifier, or tax registration);
    (ii) it does not keep written and formal accounts (this generally means that the unit does not draw up balance sheets or profit and loss documents).

Vulnerable employment: People who have jobs that carry a certain degree of uncertainty and insecurity are considered to be in situations of vulnerable employment. Contributing family workers and own-account workers are considered by ILO to be "vulnerable". Indeed, people with either status are less likely to have a formal job, generally have lower access to social advantages or social security programmes and are more greatly exposed to economic cycles.

Visible underemployment: People in visible underemployment are those who, throughout a brief reference period, wish to perform more hours, or work less than the threshold of working hours set at the national level, and are available to work longer hours in a later period of reference. Visible underemployment is therefore characterized by an insufficient workload in the light of legal standards (this duration can vary according to countries; it is between 35 and 40 hours in the vast majority of countries). ILO increasingly uses the term "time-related underemployment" instead of visible underemployment.

Invisible underemployment: People in invisible underemployment involuntarily work for income below the guaranteed minimum inter-professional wage (SMIG), as set by national legislation.

Unemployment (ILO definition): Unemployed persons include those that over the previous seven days: (i) were without employment; (ii) were available to work; and (iii) were actively looking for a job. People meeting this description are often called "unemployed according to the ILO".
Activities considered to constitute an active job search include, among others:
    - Making contact with a public placement office (employment agency, municipality and so on);
    - Contacting a private recruitment agency (interim, employment agency) in view of finding work;
    - Sending an application to an employer;
    - Undertaking searches through contacts (personal, unions and so on);
    - Publishing, replying to or reading job advertisements;
    - Participating in entry competitions, interviews and so on; and
    - Searching for land or premises, undertaking to obtain authorizations, licenses or public resources.

Unemployment (in the wider sense): people who are "unemployed according to the ILO" and the so-called "hidden unemployed" (formerly known as "discouraged workers") together represent the individuals who are "unemployed in the wider sense". The hidden unemployed are those people who during the reference period (usually the seven days prior to a survey): (i) did not have a job; (ii) were available to work; but (iii) did not actively look for a job. When discussing unemployment in unspecified terms, the ILO definition of unemployment is considered to apply.

Potential labor force: The potential labor force includes individuals without a job, those who are looking for a job but are not immediately available to work, and those without a job who are immediately available to work but are not looking for a job.

Population not in the labor force: This group includes the potential labor force, unemployed workers and other working-age persons that do not work.

Annual ETS labor supply: Each year, a cohort of students or learners decide to stop studying, with or without a diploma (or qualification). This output of youth leaving the ETS each year implicitly or explicitly constitutes the "annual ETS labor supply" to the labor market.

II. Description of the Population According to the Labor Market

Labor Force Participation Rate[1]

Definition : Percentage of the working-age population in the labor force.

Purpose/Interpretation: The labor force participation rate determines the weight of the labor force within the working-age population. It enables an appraisal of the degree of participation of the population of legal working age. It provides an indication of the relative size of the labor available to produce goods and services. The labor force participation rate is theoretically comprised between 0 percent and 100 percent. A high rate signals strong participation of the working-age population.

Calculation Method: Divide the weight of the labor force (employed population + unemployed) by the total population of legal working age and multiply the result by 100.

Disaggregation Types: By education level, gender, geographic area (region, rural or urban area of residence), age groups and so on.

Data Required: Information on the occupational status (employed, unemployed or not in the labor force) as well as on the age of the reference population group used.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies, retrospective surveys, education to labor market transition surveys, demographic censuses.

Remarks: Surveys performed since 2013 adhering to the new ILO standards offer variables that provide a better description of the work force. It should also be noted that the part of the population that is not in the labor force may include persons in the ETS. Therefore, the labor force rate is more relevant when it relates to the population not in the ETS. If not, the calculation in relation to the total population will tend to provide labor force rates that will be all the lower that youth have a marked inclination to prolong their education.

Unemployment Rate

Définition : Percentage of the labor force that is unemployed.

Purpose/Interpretation: The rate enables an appraisal of the degree to which the labor force is excluded from employment. The unemployment rate theoretically ranges from 0 percent to 100 percent. A high unemployment rate signals that an important part of the labor force can not find a job. It represents the most used indicator to assess the effectiveness of economic policies, and in particular employment policy, active[2] labor market policy and vocational training policy.

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1. Although increasingly less used in economic literature, the terms "active", "economically active" or "inactive" also enable the characterization of the population in relation to the labor market: active individuals include all working-age people who are employed or unemployed. Economically active individuals include all working-age people who have a job. It should then be noted that the inactive population is composed of those individuals of working age that are not active. The activity rate in this instance is the percentage of the working-age population that is active (the inactivity rate being equal to 1-the activity rate). The unemployment rate is then the percentage of the active population that does not have a job.
2. Active labor market policies (also called "politiques d'activation" or "programmes actifs du marché du travail" in French), are labor market programmes created by governments to encourage the unemployed to find a new job.

Calculation Method: Divide the number of unemployed persons by the total weight of the labor force and multiply the result by 100.

Disaggregation Types: By education level, gender, geographic area (region, rural or urban area of residence), age groups and so on.

Data Required: Information on the occupational status (employed, unemployed or not in the labor force) as well as on the age of the reference population group used.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies, retrospective surveys, education to labor market transition surveys, demographic censuses.

Remarks: As the value of the unemployment rate is a snapshot of the situation of a study population group with respect to employment at a given point in time, it can assume atypical values due to cyclical shocks (situational decrease in growth, policies that are in favor of or unfavorable towards short-term employment and so on). It is therefore advisable to draw conclusions on the basis of unemployment rate time series. Furthermore, debates on workplace integration generally focus on this indicator. However, the unemployment rate alone does not allow for a qualitative appraisal of workplace integration, that is multifaceted by nature (type of job, quality of employment and so on). A high unemployment rate may be the result of poor labor market regulation (a situational issue) or a mismatch of training supply with the economy's needs (a structural issue).

Note 1: The rate of unemployment in the wider sense is the ratio between the population that is unemployed in the wider sense and the total labor force (employed population plus the population that is unemployed in the wider sense).

Note 2: Youth unemployment is an important policy issue in many countries, whatever their level of development. One of the most widely used indicators to describe this situation is the ratio of youth unemployment to adult unemployment.[3] This allows an appraisal of the prevalence of unemployment among youth compared to adults. The ratio being close to 1 implies that the unemployment issue is not specific to youth, but impacts the entire country, whereas it being above 1 reflects a situation where youth are disproportionately affected by unemployment.

Note 3: The employment rate or employment/population ratio is an indicator often used in literature to describe a study population in relation to employment. By definition, the employment rate is the ratio between the number of employed individuals and the total working-age population. The employment rate provides information on the capacity of an economy to create jobs. For many countries, this indicator provides more information than the unemployment rate. The employment rate (e) can be derived from the unemployment rate (u) and the labor force participation rate (a) through the following equation: **e = a (1 – u).**

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3. "Youth" are defined (by ILO and OECD) as individuals aged 15-24 years. (However, effective definitions may vary from one country to another; in particular, the lower age limit is generally determined by the age of the end of compulsory education, where it exists.) The term "adult" then refers to individuals aged 25 years and above.

BOX 1: Diagram of the Situation of the Population in Relation to Employment and Work

The diagram elaborated below, based on the main indicators outlined above, provides a quick view of the situation of a study population with respect to employment and work:

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                        ┌─────────────────────┐
                        │   Total Population   │
                        └─────────────────────┘
              ┌──────────────────┴──────────────────┐
   ┌────────────────────┐              ┌────────────────────────┐
   │   Of working age    │              │        Other            │
   │    (15-65 years)    │              │ (under 15 or over 65 years) │
   └────────────────────┘              └────────────────────────┘
        ┌──────────┴──────────┐
 ┌─────────────┐      ┌──────────────────┐
 │ Labor Force │      │ Not in the Labor  │
 └─────────────┘      │      Force        │
                       └──────────────────┘
  ┌──────┴──────┐        ┌──────┴──────┐
┌──────────┐ ┌────────────┐ ┌──────────────┐ ┌────────┐
│ Employed │ │ Unemployed │ │  Potential    │ │ Other  │
└──────────┘ └────────────┘ │  labor force  │ └────────┘
                             └──────────────┘
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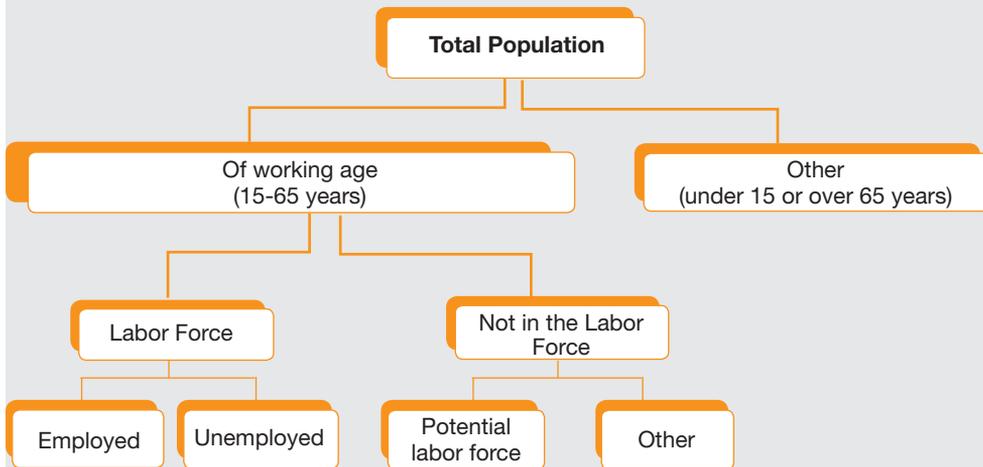
As indicated in ILO's Key Indicators of the Labour Market, several analyses can be carried out. A significant proportion of the population being unemployed, not in the labor force, or both, points to the existence of substantial underuse of the potential labor force, and hence of a country's economic potential. Governments facing this situation should, where possible, seek to analyze the reasons for this inactivity, in order to then determine the policy measures required to remedy the situation.

If for instance the majority of the population not in the labor force is comprised of women who do not work because of domestic responsibilities, governments might wish to encourage the creation of an environment facilitating the economic participation of women, with measures such as the opening of child care facilities or the introduction of flexible working hours. Another example may be disability, a recurrent reason for people to remain outside the workforce. Here, programmes promoting the employment of people with disabilities would enable a reduction of this specific inactivity rate. These points illustrate the fact that the elaboration of policies that are sensitive to a particular national context can only be contemplated after a detailed examination of the causes of inactivity in that country.

III. Description of Employment Status

Vulnerable Employment Rate

Definition : The percentage of the employed population whose employment is vulnerable.

Purpose/Interpretation: This indicator aims to present the weight in the economy of jobs that carry high levels and degrees of uncertainty and insecurity. A high vulnerable employment rate signals the existence of a relatively important number of precarious jobs. This rate accompanies the interpretation of the unemployment rate, that may be low due to the great prevalence of precarious employment.

Calculation Method: Divide the number of individuals whose job is vulnerable by total employment and multiply the result by 100.

Disaggregation Types: By gender, level of education, type of qualification, age group, activity sector and so on.

Data Required: Information on the characteristics of the jobs of economically active individuals, including in particular their socio-professional classification.

Data Sources: Employment surveys, household surveys with an employment component and so on.

Remarks: When comparing countries, or areas within a given country, attention must be paid to the definitions, data collection methods and level of coverage used by surveys that measure vulnerable employment. Indeed, these three elements play a fundamental part in how results are measured and interpreted. This indicator is included in the list of those periodically computed or updated by ILO for its member countries. Results obtained with the use of the ILO definition should be interpreted with great care, as a significant proportion of own-account workers are frequently found to be in comfortable or non-vulnerable work situations.

Informal Sector Rate

Definition : The percentage of enterprises (production units) within the informal sector.

Purpose/Interpretation: It is used to measure the share of a country's informal economy. By inverse reasoning, the informal sector rate provides an idea of the level of an economy's modernization. It also enables an appraisal of a government's tax raising capacity, in as much as an important informal sector constitutes a limit to the levy of contributions to national wealth.

Calculation Method: Divide the number of informal enterprises (production units) by the total national number of enterprises (production units) and multiply the result by 100.

Disaggregation Types: By branch of activity, geographic area (urban or rural area, location) and so on.

Data Required: Information on informal production units, their incorporation/registration, book-keeping, the type of activity and so on.

Data Sources: Labor force surveys, employment surveys, business surveys, government sources, informal sector surveys and so on.

Remarks: Household surveys with an employment component are often the only available data source to measure this indicator in SSA. The use of these surveys does not however enable an appraisal of informal employment in its full complexity. For this reason, it is recommended to keep in mind that the estimated values are generally approximations.

Informal Employment Rate

Definition: The percentage of the total employed population whose occupation is informal.

Purpose/Interpretation: The availability of this indicator, conversely, enables an appraisal of the level of modernization of employment. A drop in the informal employment rate could reflect some improvement in work conditions and income.

Calculation Method: Divide the weight of informal employment by total employment and multiply the result by 100.

Disaggregation Types: By gender, education level, type of qualification, geographic area (urban or rural area, location), activity sector, type of job and so on.

Data Required: Information on employment characteristics (leave benefits, possession of a pay slip, social security declarations), socio-professional category (SPC), business registration/incorporation (with tax authorities or the chamber of commerce) and so on.

Data Sources: Employment surveys, household surveys with an employment component, informal sector surveys and so on.

Remarks: Household surveys with an employment component are often the only available data source to measure this indicator in SSA. The use of these surveys does not however enable an appraisal of informal employment in its full complexity. Indeed, in the absence of adequate information enabling the identification of informal employment, common practice consists in considering individuals with one of the following socio-professional categories as being informally employed: employers, own-account workers, contributing family workers, apprentices, unskilled workers, household workers and undeclared employees. For this reason, it is recommended to keep in mind that published values are generally approximations.

Visible Underemployment Rate

Definition: The percentage of total employment that is in a situation of visible underemployment.

Purpose/Interpretation: This indicator enables an appraisal of the degree of underutilization of the human capital available in the labor market. It also reflects a quantitative insufficiency of jobs.

Calculation Method: Divide the number of individuals in a situation of visible underemployment by total employment and multiply the result by 100.

Disaggregation Types: By gender, education level, geographic area (urban or rural area, location, region), type of employment (formal, informal), profession, activity sector and so on.

Data Required: Information on the occupational status and workload of the study population considered.

Data Sources: Employment surveys, household surveys with an employment component, government sources, graduate tracer studies and so on.

Remarks: This indicator is most relevant when applied to the formal sector because the vast majority of players in this sector respect current labor regulations.

Invisible Underemployment Rate

Definition : The percentage of total employment that is in a situation of invisible underemployment.

Purpose/Interpretation: This indicator is used to appraise the productivity of labor. It reflects a poor distribution of labor resources or an imbalance between labor and other factors of production, which leads to low incomes and poor productivity.

Calculation Method: Divide the number of individuals in a situation of invisible underemployment by total employment and multiply the result by 100.

Disaggregation Types: By gender, education level, geographic area (urban or rural area, location, region), type of employment (formal, informal), profession, activity sector and so on.

Data Required: Information on the occupational status and income of the study population considered.

Data Sources: Labor force surveys, employment surveys, household surveys with an employment component, government sources and so on.

Remarks: Income data are not always available in household surveys with an employment component, and where they exist, they tend to be of poor quality. This makes estimating this indicator fairly difficult. Statistics on invisible underemployment should therefore be interpreted with much care and attention.

Note 4: The term "underemployment rate" is found in economic literature. It usually represents the percentage of the employed population that is (visibly or invisibly) underemployed. It is however necessary to be careful when conducting comparative analysis of the "underemployment rate". Indeed, some countries use the term in reference to time-related underemployment, whereas others include unemployment in its estimation.

IV. Quality of the Education/Training & Employment

Share of Early Leavers

Definition: The percentage of the population leaving the ETS early. In the course of a given academic year n, youth are considered to be leavers if they were enrolled in year n-1 and were no longer enrolled in year n. Leavers are labeled "early" if one of the following two conditions apply: (i) they are under the minimum legal working age in the country; or (ii) they did not complete basic or compulsory education.

Purpose/Interpretation: To estimate the share of ETS leavers that are insufficiently prepared to join the labor market. It is hoped that this share will be as low as possible. Early leavers are generally found to be excluded from the modern sector of the economy, and by knock-on effect, increase the size of the informal sector. They are also often found to inflate the ranks of the population group that is not in the labor force.

Calculation Method: Divide the number of ETS early leavers for a given year by the total number of leavers that same year and multiply the result by 100.

Disaggregation Types: By gender, education level, geographic area (urban or rural area, location) and so on.

Data Required: Information on the age, education level and schooling status of ETS leavers.

Data Sources: Household surveys with an education component, EMIS and so on.

Remarks: The concept of "leaver" most often refers to an exit from the "formal" education system. Available data do usually not allow to include leavers from the nonformal or informal systems. Leavers from the formal system are systematically associated to the prospect of joining the labor market, despite the reality that they may have several other causes (integrating the nonformal training system, starting an internship and so on).

Share of Unqualified Leavers

Definition: The percentage of the population that left the ETS without a qualification. Higher education and the TVET system are the ETS cycles responsible for providing learners with technical and vocational skills. Unqualified leavers are those for whom the highest level attained is neither higher education, nor technical and/or vocational secondary.

Purpose/Interpretation: To measure the qualification level of the ETS' "annual labor supply" to the labor market. A low proportion reflects an ETS' good capacity to produce qualified labor for the labor market.

Calculation Method: Divide the number of leavers for whom the highest level attained is neither higher education nor technical and/or vocational secondary by the total number of leavers that same year and multiply the result by 100.

Disaggregation Types: By gender, geographic area (urban or rural area, location), training cycle (TVET, higher) and so on.

Data Required: Information on the training level and type of training (general education, TVET, higher) of ETS leavers, institutions attended and date of exit from the ETS.

Data Sources: Household surveys with an education component, EMIS and so on.

Remarks: An person leaving higher education or TVET without a diploma or certificate is usually considered to be an unqualified leaver. Some survey data do not enable the determination of the diploma or certificate of leavers.

BOX 2 : Determination of the Flow of ETS Leavers

Several methods are available to determine the flow of current education system leavers, using either government statistics (Education information management systems – EMIS) or household surveys with national coverage (HDS, MICS, QWB and so on) as baseline data.

Ideally, such research should be based on an education database that enables the tracing of students, and therefore the identification of leavers and their respective education levels. In practice, such a database is almost never available, so common school statistics on enrollment by grade for two consecutive school years are often used.

The estimation of leavers is then reached by comparing data on the number of students for those two years. One starts from the hypothesis that students enrolled in a given grade in academic year t, would either be enrolled in the following grade (as new entrants) or enrolled in the same grade (as repeaters) in academic year t+1, if they are still in the system. The number of leavers can be deduced by subtracting the number of new entrants in the following grade plus the number of repeaters in the same grade in year t+1, from the number of students in the grade considered in year t. This approach implicitly assumes that there are no (or very few) enrollments in the middle grades, of students who newly join the education system (migrations), in as much as it considers all new entrants to a given grade as being students that were enrolled in the previous grade, the previous year.

• Determination of the Current Flow of ETS Leavers on the Basis of Household Surveys

In cases where education information systems do not provide data to estimate the volume of annual leavers from the ETS, resorting to household surveys is an alternative. Two estimation approaches can be contemplated:

• On the basis of direct questions on individuals' current and past school attendance

Even when surveys were not specially designed to cover this question, they often include an education component. Two questions on the schooling status of surveyed individuals can enable an estimation of education system leavers. The first bears on current school attendance (Are you currently enrolled in school?) and the second on school attendance during the year prior to the survey (If you are not currently enrolled in school, were you enrolled last academic year?) Then any person not enrolled the year of the survey, but who was the previous year, is considered to be a leaver. Other questions (such as relating to the highest level attained) can enable a distribution of leavers according to their education level.

This approach carries the advantage of providing the situation of leavers living within national borders at the time of the survey. However, these surveys' frequency is not always annual, and the delay between the data collection and publication phases can sometimes be considerable.

• On the basis of labor market data

The second approach consists in using trends in the number of active individuals in the labor market. This approach requires the availability of databases from two household surveys and carries the disadvantage of not providing the flow of leavers who are too young to enter the labor market, being based on the assumption that education system leavers who join the labor market comply with the legal working age (usually over 15 years). Where the databases of two surveys conducted at a five-year interval are available, the first step would be to determine the growth in the number of jobs in-between them. This growth in total employment represents the volume of new jobs created and filled between the two dates. Assuming these new jobs have been taken by education system leavers, the number of active leavers is reached by comparing the number of new jobs filled to the employment rate (1-unemployment rate) for youth aged 15-29 years having been enrolled in the past. The number of leavers is reached by comparing the number of active leavers obtained above with the employment rate for the same population group (youth aged 15-29 years having been enrolled in the past). The average annual number of leavers can finally be obtained by dividing the estimated number of leavers over the period by 5 (or the number of years between the two data sets).

V. Professional Integration Issues Encountered by Education and Training System Leavers

Average Time to Access a First Job

Definition: The average time (usually in months) elapsed between the moment a graduate completes their education and the moment they find their first job.

Purpose/Interpretation: To assess the average duration of the transition from the education system to employment. The shorter this duration, the more the integration of youth into the labor market is considered to be fast and fluid.

Calculation Method: The computation of this indicator requires the availability of a household survey with an employment component, or better still an employment survey, in which the following two questions are asked:
(i)   Are you currently in your first job?(or an equivalent question); and
(ii) How long (in months) were you unemployed before finding your first job? (or an equivalent question).

The average duration of the transition from school to employment (the average time to access a first job) is estimated as the median of the answers given to question (ii), among those persons answering "Yes" to question (i), who are currently in their first job.

Disaggregation Types: By gender, education level, age group, geographic area (urban or rural area, location).

Data Required: Occupational status (economically active, unemployed), current school attendance, age of individuals, information on the first job and so on.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: Access to a first job may not be long-lasting. It is therefore advisable to complement this indicator with those relating to job continuity. Furthermore, failing the availability of a graduate tracer study, the results derived from transversal surveys are only approximations.

> **BOX 3: Average Duration of the Transition from School to the Labor Market**
>
> The average duration of access to first employment is an indicator that initially seems worthwhile to determine the ease or difficulty with which youth integrate the workplace; but in practice it raises complex measurement issues. Indeed, the precise calculation of this duration for each person requires the use of longitudinal data (panel surveys or graduate tracer studies).

The approach presented above leads to approximate results based on a transversal survey, but its application requires availability of a body of information on the first job. However, with the exception of employment surveys strictly speaking, data on first jobs is not common in the majority of household surveys with an employment component.

To lift this constraint, OECD elaborated in 1998 an approach to the computation of the "duration of the transition from school to the labor market," on the basis of transversal surveys offering no data on first employment. This indicator is based on occupational status by single age and can be elaborated with the help of common labor statistics. Indeed, OECD considers that the duration of the school-work transition can be defined as the period elapsed between: (i) the minimum age at which under 75 percent of youth study and do not work; and (ii) the minimum age at which at least 50 percent of youth work and no longer study.

Based on this, OECD (1998) recommends that the duration of the transition be estimated as follows:

✓ Select the population that studies but does not work, and distribute it by age into quartiles: the third quartile thus represents the average age of school leavers;
✓ Select the population that does not study but works, and distribute it by age into quartiles: the second quartile (the median) represents the average age of access to first employment;
✓ The average duration of the transition from school to work is the difference between the average age of access to first employment and the average age of school leavers.

To obtain homogenous and comparable results, the 15-29 years age group is chosen as the reference population. However, it should be remembered that this approach, although permitting an approximation of the average duration of the transition from school to the labor market, remains weak in contexts where the practice of birth registration is not wide-spread, or where issues relating to individuals' age declaration/measurement are prevalent.

Average Duration of Employment in the Early Years of Occupation

Definition: Youth leaving school tend to switch among different statuses during the first years of their active life (unemployment, inactivity, employment). The average duration of employment during the first years of active life is obtained as the sum of the time spent employed throughout each of the years of the period under consideration.

Purpose/Interpretation: The indicator sheds light on the difficulty, or lack of, that education system leavers face to attain sustainable integration into the labor market. The greater the average duration of employment during the considered transition period, the more sustainable youth's integration into the workplace.

Calculation Method: A survey carried out on a cohort of N individuals, collected from each respondent information on the time spent under each of the different statuses during the first three years of their active life. The results for a given respondent i are presented in the table below.

TABLE 1: Time Spent under Each Different Status During the First Three Years of Active Life, for Respondent i

Year 1			Year 2			Year 3		
Unemployed	Inactive	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive	Employed
6 months	2 months	4 months	3 months	1 month	8 months	2 months	1 month	9 months

The time spent employed during the first three years of active life (Ti) is the sum of the time spent employed during each of those years, so Ti = 4 months + 8 months + 9 months = 21 months. This calculation can be carried out for each individual of the study population (of N individuals). The average time or duration of employment Tavg for the first three years of active live will be obtained as the average duration of employment for the entire study population:

$$T_{moy} = \frac{1}{N} \times \sum_{i=1}^{n} Ti$$

Disaggregation Types: By gender, education level, geographic area (urban or rural area, location).

Data Required: Individuals' occupational status (economically active, unemployed), current school attendance, age, date of leaving school.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: The calculation of the average duration of employment during the first years of active life (3-5 years are generally considered) requires the availability of longitudinal or retrospective surveys that retrace the working life of leavers during their first years in the labor market. Indeed, in these surveys youth are asked to provide an employment history. This type of survey is rare in the context of African countries. Box 4 presents the most common approach to estimating this indicator on the basis of transversal data obtained through household surveys.

Note 5: In addition to calculating the average duration of employment during the first five years of active life, it is often instructive to also calculate the "average duration of unemployment" and the "average duration not in the labor force". When combined, these three indicators provide a global perspective of the lives of ETS leavers in the first five years of their active life. This naturally implies the following reality: "average duration of employment" + "average duration of unemployment" + "average duration not in the work force" = 5 years.

BOX 4: Computation of the Average Duration of Employment of a Cohort of Leavers During their First Five Years of Active Life, on the Basis of a Transversal Type Survey (Household Survey with an Employment Component).

To estimate the average duration of employment, the study group is composed of youth aged 15-29 years having left the basic training system. A distribution of their labor market status is then used, according to duration. The calculation can be performed for several categories (k) of respondents.[4]

Algebraically, where ER is the employment rate t years after the end of the education of category k, the average number of years spent in employment, NE, D years after completing basic training, is obtained by:

$$NE_{kD} = ER_{k1} *D + (ER_{k2} - ER_{k1}) *(D-1) + (ER_{k3} + ER_{k2}) *(D-2)+…+ (ER_{kD} - ER_{(k(D-1)}) *1$$

The period is often chosen to be five years (D=5); the literature considers that the threshold of five years is a reasonable approximation of the duration of the transition process from school to work in Sub-Saharan African countries.5 The k category may refer here to the modality of: the level of education (primary, secondary, TVET, higher); or of gender (man or woman); or again of the geographic area (urban or rural).6 Where required, the "average duration of unemployment" and the "average duration of inactivity" can also be estimated. The sum of the three averages should be 5 years.

NEET (Not in Education, Employment or Training) Rate

Definition: The percentage of the population aged 15-24 years that are not in employment, or in the education system, or undergoing training. In the literature this group is often called NEET (Not in Education, Employment or Training).

Purpose/Interpretation: The NEET rate is the ideal indicator to appraise the difficulty youth face in integrating the workplace. The greater the value of the indicator, the greater the scale of the difficulties faced by youth in terms of access to employment on the labor market.

Calculation Method: Divide the number of NEET individuals by the total youth population aged 15-24 years and multiply the result by 100.

Disaggregation Types: By gender, education level, qualification level, geographic location (urban/ rural, region and so on).

Data Required: Information on the occupational status and current school attendance (whether enrolled or not) of youth aged 15-24 years.

Data Sources: Employment surveys, household surveys with an employment component, surveys of the school-workplace transition and so on.

Remarks: This is one of the indicators selected to monitor SDG8. The European Commission also selected the NEET rate in 2010 as an official indicator to appraise the professional integration difficulties faced by youth in the labor market. Household survey data only enable to grasp the situation of youth that are in the formal education system. The evaluation of NEET with such surveys can provide biased results given that some youth will be considered to be "unschooled" despite following training in the nonformal or informal system.

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4. Determined by education level (primary, secondary, TVET, higher), gender, or again region.
5. This number may change according to the specifics of each country, or even according to the average duration of the transition calculated in each country.
6. The choice of the categories to highlight will contribute to inform the policies needed to target population groups requiring support or facing particular difficulties in finding work.

VI. Strength of the Education/Training & Employment

Over-qualification Rate or Vertical Mismatch

Definition: The percentage of employed individuals whose qualification is higher than that required by their occupation. Active individuals will be so-called over-qualified if they hold a qualification of a level deemed higher than that required for the position they hold (a bridging table will supposedly have been adopted in the study country).

Purpose/Interpretation: The over-qualification rate is used to analyze the match of education and training with employment in a country. A high rate signals that the majority of active individuals hold a qualification level higher than that required for their position. This indicator reflects the imbalance between the supply and demand of labor in the workplace. The mismatch concept enables an appraisal of the correspondence between individuals' level of training and positions held.

Calculation Method: Divide the number of individuals employed below their qualification level by total employment and multiply the result by 100.

Disaggregation Types: Level and type of qualification, gender, area of residence, age group, activity sector, type of job and so on.

Data Required: Data on socio-professional categories, the level of qualifications or degrees, the occupational status of individuals and a bridging table between socio-professional categories and education levels. Annex 1 presents an example of a bridging table.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: This indicator tends to inflate the share of the population in paid employment. Some individuals may be in lower socio-professional categories but have income higher than the socio-professional category they should belong to. For this reason, economic literature has defined the concept of strict over-qualification.

In practical although elaborate terms, to determine the group of people that are strictly over-qualified, it is sufficient to: (i) estimate the number of individuals who are over-qualified for their job; and (ii) subtract the number of individuals whose income is equal or higher than the median income for their theoretical socio-professional category (the one they should belong to in principle). Furthermore, it is often complex to define which qualifications are required for the different types of occupation that exist in the economies of African countries, and those of SSA in particular.

Adjustment Rate in Employment or Horizontal Mismatch

Definition: The percentage of economically active individuals who practice an activity in an area bearing no relation to their training specialty. A person is deemed to be misadjusted in employment or horizontally mismatched when the specialty of their occupation is not that of their training. For instance, a mechanic who works as an electrician.

Purpose/Interpretation: The rate enables an appraisal of the extent to which leavers of the qualification process hold a position corresponding to the specialty of the training followed. The higher the indicator, the less youth practice in their areas of training, reflecting an imbalance between the supply of training and labor market demand, and having a negative impact on a country's overall productivity.

Calculation Method: Divide the number of individuals misadjusted in employment by total employment and multiply the result by 100.

Disaggregation Types: By gender, level and type of education, geographic location (urban/rural, region and so on).

Data Required: Information on (i) the national classification of training specialties; (ii) a classification of professional occupation/area specialties; and (iii) an "theoretical" bridging table between training specialties and professional/occupational specialties. Annexes 2, 3 and 4 present examples of such classifications.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: Very little research has been carried out in SSA on the correspondence between training and occupational specialties. Indeed, the majority of household surveys do not collect information on the training specialty of economically active individuals, or should they, sample size does not support robust analysis.

Strength of the "Education and Employment Access" Link

Definition: The level of education's contribution to employment access. This indicator is an estimation of the share of the identified factors explaining employment access that can be attributed to education.

Purpose/Interpretation: The strength of the "education and employment access" link is a synthetic measure of the level of value provided by education in terms of access to employment. For leavers, having passed through an education system is supposed to facilitate their integration into the workplace. If an "all else being equal" modelization of the strength of the link between access to employment and level of education produces a Cramer's V of 0.5, this means that in the workplace, access to a job is explained by the level of education to the tune of 50 percent.

Calculation Method: The strength of the link between the education level and employment access variables is commonly measured by Cramer's V between the two.

Disaggregation Types: By gender, geographic location (urban/rural, region, area) and so on.

Data Required: Individuals' level of education and employment status (active or not).

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: This is a useful indicator to carryout comparisons between countries or to analyze trend dynamics over time.

Strength of the "Education and Socio-Professional Category" Link

Definition: The level of education's contribution to access to a given class of employment. This indicator is an estimation of the share of the factors explaining access to a given socio-professional category that is attributable to education.

Purpose/Interpretation: The strength of the "education and socio-professional category" link is a synthetic indicator that enables an estimation of education's contribution to those factors that explain the employment category that active individuals belong to in the workplace. It measures the link between education and the employment category held by the active population on the labor market. If a modelization of the strength of the link between education and SPC produces a Cramer's V of 0.2, this means that SPC in the workplace is determined by education to the tune of 20 percent.

Calculation Method: The strength of the link between education and SPC is commonly measured through Cramer's V between the two variables.

Disaggregation Types: By gender, geographic location (urban/rural, region, area and so on).

Data Required: Information on individuals' level of education, SPC and occupational status.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: This is a useful indicator to carryout comparisons between countries or to analyze trend dynamics over time.

Strength of the "Education and Remuneration" Link

Definition: The level of education's contribution to determining remuneration levels in the labor market. This indicator is an estimation of the share of the factors explaining the level of remuneration practiced in the workplace that is attributable to education.

Purpose/Interpretation: It provides a global idea of the importance of education in defining remuneration levels in the workplace. To illustrate, if a modelization of the strength of the link between remuneration and the number of years of education produces an R2 value of 0.6, the level of education or training will be said to explain 60 percent of remuneration levels, or that it contributes to the tune of 60 percent to define the level of remuneration of people employed in the labor market.

Calculation Method: It is the coefficient of determination derived from the linear regression of salary on the length of education and on length of education squared. Here the variable representing education is given by the number of years of education, estimated according to the highest grade attained by an individual. It is important in performing this regression to exclude the extreme values of the remuneration scale (the lowest 5 percent and the highest 5 percent).

$Y_i = a_0 + a_1\ n_i + a_2\ n_i^2 + \beta_i$
   Y_i : is the revenue of worker i; and
   n_i : is the number of years of education of worker i.

Disaggregation Types: By gender, geographic location, activity sector, type of profession and so on.

Data Required: Information on the occupational status, occupational income and level of education of the study population.

Data Sources: Employment surveys, household surveys with an employment component, graduate tracer studies and so on.

Remarks: The indicator is useful to carryout comparisons between countries or to analyze trend dynamics over time. It is most relevant where better data on the income of the employed population are collected.

BOX 5: Measuring the Contribution of Education to the Professional Integration of Leavers

Education and training can be considered to be a qualitative variable, or a quantitative one.

Education is qualitative if it is considered or coded according to the highest cycle attained and/or the fact of having followed specialized training or not (education levels usually adopt the following distribution: primary, lower general secondary, upper general secondary, TVET and higher; and the employment variable: employed or not employed). Education is quantitative when it is approached from the angle of the number of years of study attended.

The variables that describe professional integration into the labor market are also either qualitative or quantitative. The qualitative variables include access to employment in particular (having a job or not) or access to decent employment (having a stable or insecure position, being underemployed or not and so on). The quantitative variables describing professional integration include, inter alia, the duration of unemployment and the level of remuneration. It is therefore possible to estimate the relationship between: (i) education and access to employment; (ii) education and the quality of employment; (iii) education and the duration of unemployment; or (iv) education and the level of remuneration.

Strength of the Relationship between Two Quantitative Variables
The strength of the relationship between two quantitative variables can be assessed by running a simple linear regression model linking the two. A proxy measure of the strength or intensity of the link between the two variables is provided by the coefficient of determination of the regression, $R2$. However, this approach only assesses linear relationships and can not, for instance, describe a quadratic relationship. To solve this, it is advisable to run a multiple regression on variable Y (remuneration for instance) in relation to X (the number of years of education) and X^2. The coefficient of determination of the econometric estimation measures the intensity of the link between variable X (remuneration) and variable Y (the number of years of education).

Strength of the Relationship between Two Qualitative Variables
The intensity of the relationship between two qualitative variables is commonly measured by Cramer's V. Take two qualitative variables X and Y, with the respective modalities m and n, collected among a group of T individuals. A KHI2 test measuring the relationship between the two variables is run, producing the khi2 statistic. This in turn enables the calculation of Cramer's V, that contributes to appraise the intensity of the link between variables X and Y. The indicators obtained vary between 0 and 1; a value close to 1 implies a perfect link (match) and one close to 0 implies the absence of any link.

ANNEXS

ANNEX 1 : **Illustrative Example of a Bridging Table between Socio-Professional Categories and Education Levels**

	Effective SPC (as Indicated in Household or Employment surveys for the Formal Sector)	Corresponding Level of Education
1	Higher managerial professions, engineers and the like	Higher education (Masters level or above, or TVET equivalent), achieved after 4-5 years.
2	Intermediate managers and professionals	Higher education (Bachelors level or below, or TVET equivalent).
3	Employees, qualified workers	Upper secondary (or TVET equivalent).
4	Employees, semi-qualified workers	Lower secondary (completed or not), or TVET equivalent.
5	Physical/unqualified laborers Informal sector workers	Primary (completed or not).

ANNEX 2 : **Aggregated Training Specialty Classification, INSEE, France.**

10 A: General training
11 A: Mathematics and Sciences
12 A: Humanities and Law
13 A: Arts and Social Sciences
20 A: Pluri-technological production specialties
21 A: Agriculture, Fishery, Forests and Green Spaces
22 A: Transformation
22 B: Agri-business, Nutrition and Cooking
23 A: Civil Engineering, Construction and Wood
24 A: Flexible materials
25 A: Mechanics, Electricity, Electronics
25 B: Electricity, Electronics (not including automation or computer-integrated manufacturing
31 A: Trade and Management
31 B: Finance, Banking, HR, Management
32 A: Communication and Information
32 B: Computing
33 A: Social work
33 B: Health
33 C: Cultural and leisure activities, Hospitality and Tourism
33 D: Hairdressing, Cosmetics and other service specialties

ANNEX 3: **Aggregated Classification of Fields of Education by Specialty, UNESCO, 2011**

General training
Education, Arts and Humanities
Social and Behavioral Sciences
Journalism and Information
Business and Management
Law
Life Sciences
Physical Sciences
Mathematics and Statistics
Computer Science
Engineering and related techniques
Transformation and Conditioning Industries
Architecture and Construction
Agriculture, Forestry and Fishery
Veterinary Sciences
Health
Social Protection and Work
Hospitality and Catering Services
Hairdressing, Beauty Care and other personal services
Transport Services
Environmental Protection
Security Services

Annex 4: **International Standard Classification of Occupations, ILO (CITP-08/ISCO-08)**

	Major Groups of the CITP-08 (French)	Major Groups of the ISCO-08 (English)
1	Directeurs, cadres de direction et gérants	Managers, senior officials and legislators
2	Professions intellectuelles et scientifiques	Professionals
3	Professions intermédiaires	Technicians and associate professionals
4	Employés de type administratif	Clerk (Clerical Support Workers)
5	Personnel des services directs aux particuliers, commerçants et vendeurs	Services and Sales Workers
6	Agriculteurs et ouvriers qualifiés de l'agriculture, de la sylviculture et de la pêche	Skilled Agricultural, Forestry and Dishery Workers
7	Métiers qualifiés de l'industrie et de l'artisanat	Craft and Related Trades Workers
8	Conducteurs d'installations et de machines, et ouvriers de l'assemblage	Plant and Machine Operators and Assemblers
9	Professions élémentaires	Enseignement primaire
10	Professions militaires	Armed Forces occupations

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Knowledge of the most commonly used labor market terms and indicators by education sector actors is a precondition for the management of the education sector in relation to the labor market and the needs of the economy. UNESCO's IIEP-Pôle de Dakar, with this publication, offers some context to those indicators that are most common and relevant to the countries of sub-Saharan Africa.

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