
INTERNATIONAL LABOUR OFFICE
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**Guidelines concerning measurement of
qualifications and skills mismatches of
persons in employment**

Guidelines concerning measurement of qualifications and skills mismatches of persons in employment

The Twentieth International Conference of Labour Statisticians (ICLS),

Recalling the existing international standards on statistics of labour underutilisation contained in the resolution concerning statistics of work, employment and labour underutilization adopted by the 19th ICLS (2013),

Noting that the term labour underutilization refers, in addition to insufficient labour absorption, to various forms of inadequate labour absorption such as skill mismatch and slack work (paragraph 42 of the 19th ICLS resolution concerning statistics of work, employment and labour underutilization),

Supporting the part of the request made by the 19th ICLS in paragraph 97 of the 19th ICLS resolution concerning statistics of work, employment and labour underutilization, that the International Labour Office continue methodological work on the measurement of inadequate employment related to skills,

Recognizing that qualification is only a proxy for the skills mastered at the moment of completion of an educational programme, and that skills may change over time with on-the-job training, past work experience, informal learning, etc. Therefore, both mismatch of qualifications and skills need to be assessed separately,

Recognizing that the considerable diversity of defining and measuring of qualification and skills mismatches poses limits to the extent to which statistics on these topics can be harmonized across countries,

Recognizing further that international guidelines on the measurement of qualification and skill mismatches will promote the development of these statistics and improve their international comparability,

Endorses the following guidelines, and encourages countries to test the conceptual framework on which they are based.

A. OBJECTIVES AND USES

1. These guidelines aim to set standards for defining and measuring qualification and skills mismatches of persons in employment¹ and facilitate the production of statistics on mismatches that can complement the existing measures of labour underutilization, in particular unemployment, time-related underemployment and potential labour force.
2. Each country should aim to measure level and trends of various forms of mismatches, to provide an adequate information base for the various users of the statistics, taking account of the specific national needs and circumstances. Such measures should be designed to achieve a number of objectives, in particular to:
 - (a) monitor labour markets for the design, implementation and evaluation of economic and social policies and programmes related to skills development including vocational education and training, employment creation, income generation, industry development and related decent work policies;

¹ Mismatch of persons not in employment is outside the scope of these guidelines.

- (b) evaluate the impact of mismatches by level of education, field of study and/or skills on economic and social outcomes, including labour productivity;
- (c) assess the extent to which population groups such as women and men, young people, migrants, persons with disabilities and other groups of particular policy concern are affected by various forms of mismatches.

3. To achieve these objectives, the concepts used in the compilation of the statistics on qualification and skills mismatches should be developed in consultation with the various users of the statistics. These statistics should be compiled and disseminated at regular intervals.

B. DEFINITIONS

4. Educational attainment, qualifications and field of study are defined by UNESCO in International Standard Classification of Education (ISCED 2011) and International Standard Classification of Education: Fields of Education and Training 2013 (ISCED-F 2013)² as follows:

- Educational attainment is the highest level of education an individual has successfully completed. This is usually measured with respect to the highest education programme successfully completed, which is typically certified by a recognized qualification.
- Qualification is the official confirmation, usually in the form of a document, obtained through:
 - i) successful completion of a full education programme;
 - ii) successful completion of a stage of an education programme (intermediate qualifications); or
 - iii) validation of acquired knowledge, skills and competencies, independent of participation in an education programme (acquired through non-formal education or informal learning).
- Field of study is broad domain, branch or area of content covered by an education programme, course or module.

5. Skills are defined as the innate or learned ability to apply knowledge acquired through experience, study, practice or instruction, and to perform tasks and duties required by a given job. Distinction might be made between:

- (a) Job-specific/technical skills. These are skills particular to an occupation which include specialist knowledge needed to perform job duties; knowledge of particular products or services produced; ability of operating specialized technical tools and machinery; and knowledge of materials worked on or with.
- (b) Basic skills. These skills (such as literacy, numeracy and ICT (Information Communication Technology) skills) are considered as a prerequisite for further education and training and for acquiring transferable and technical skills.
- (c) Transferable skills. These are skills that are relevant to a broad range of jobs and occupations and can be easily transferred from one job to another. They include but are

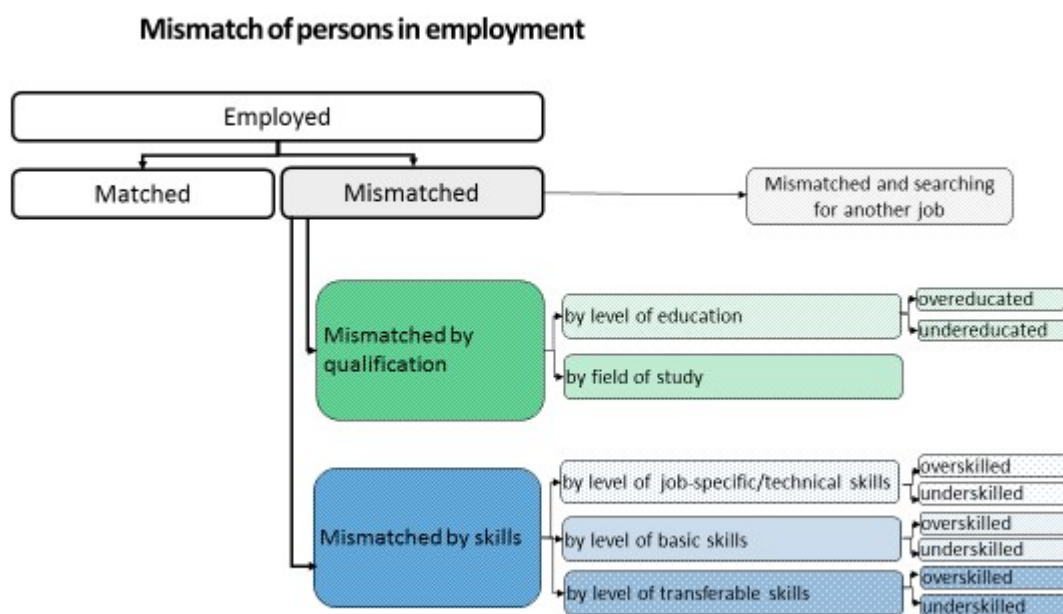
² <http://uis.unesco.org/en/topic/international-standard-classification-education-isced> and <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>

not restricted to problem-solving and other cognitive skills, physical skills, language skills, socio-emotional and personal behavioural skills.

Depending on the complexity and range of tasks and duties to be performed on the job, different types of skills and levels of proficiency may be required for different occupations or group of occupations.

C. CONCEPTS

6. A person in employment may experience two main forms of mismatches: qualification mismatch and skill mismatch.
7. A person in employment is considered as being matched or mismatched, as defined in paragraphs 8 and 9, on the basis of requirements for their main job. In case of multiple jobs holdings, where relevant, a person may also be considered as matched or mismatched on the basis of requirements for their other jobs.



8. **Qualification mismatch** refers to a situation in which a person in employment, during the reference period, occupied a job whose qualification requirements did not correspond to the level and/or type of qualification they possessed.

Qualification mismatch include:

- (a) **Mismatch by level of education:** it occurs when the level of education of the person in employment does not correspond to the level of education required to perform their job.
 - Over-education occurs when the level of education and training of the person in employment is higher than that required to perform their job;
 - Under-education occurs when the level of education and training of the person in employment is lower than that required to perform their job.

(b) Mismatch by field of study: it occurs when the field of study of the person in employment does not correspond to the field of study required to perform their job.

9. **Skill mismatch** refers to a situation in which a person in employment, during the reference period, occupied a job whose skills requirements did not correspond to the skills they possesses.

Skill mismatch may refer to mismatch of overall skills or to types of skills. The mismatch by type of skills includes:

- (a) Mismatch of job-specific/technical skills
- (b) Mismatch of basic skills
- (c) Mismatch of transferable skills

A person in employment may experience:

- Over-skilling, which occurs when the level and/or types of skills of the person in employment exceeds those required to perform their job.
- Under-skilling, where occurs the level and/or types of skills of the person in employment is lower than those required to perform their job.

D. MEASUREMENT

10. The measurement of qualification and skill mismatches should be based on suitable data compiled as part of the existing household and/or establishment based surveys. Data from recent administrative records and secondary sources can also be used.

Qualification mismatch

- (a) Mismatch by level of education.

11. Measurement of mismatch by level of education requires information about the highest level of educational attainment³ of a person in employment, their occupation and the information regarding the relevance of different levels of education for each occupation or occupational group.

12. The “thresholds” used as a boundary between matched and mismatched, could be determined on the basis of educational requirements as specified in relevant legislation or national practice, and set for specific occupations or occupational groups (i.e. normative approach).

13. Where national requirements are not either available or appropriate, the “thresholds” could be empirically determined on the basis of (i) the modal level of education of all persons in employment in an occupation or occupational group⁴ (i.e. statistical approach), or (ii) modal value of the self-assessed level of education required to perform the job by all persons employed in a given occupation or occupational group (i.e. subjective approach)⁵.

³ Alternatively, completed years of schooling.

⁴ Alternatively, the mean, median or modal values of the completed years of schooling of all persons in employment, by occupation or occupational group.

⁵ Instead of using a threshold, a person’s direct assessment of the match between their level of education and the level of education required to perform the job may be used.

14. Intensity (severity) of mismatch (over- and under-education) may be estimated on the basis of the number of levels of educational attainment³ above or below the threshold used.
- (b) Mismatch by field of study.
15. Measurement of field of study mismatch requires information about the main field of study in the highest level of education (or the most recent level of education) of a person in employment, their occupation and the information regarding the relevance of different fields of study for each occupation or occupational group.
16. The “thresholds” used as a boundary between matched and mismatched, could be determined on the basis of requirements as specified in relevant legislation or national practice, in terms of fields of study that are considered as appropriate for each occupation or occupational group (i.e. normative approach).
17. Where national requirements are not either available or appropriate, the “thresholds” could be empirically determined on the basis of (i) the modal field of study of all persons in employment in an occupation or occupational group (i.e. statistical approach), or (ii) modal value of a self-assessed field of study required to perform the job by all persons employed in a given occupation or occupational group (i.e. subjective approach)⁶.

Skills mismatch

18. Measurement of skills mismatch requires information about the skills required for competent performance on the job and skills possessed by a person in employment.
19. Mismatch may be measured by assessing either types of skills or overall skills possessed and required for competent performance on the job, by the person in employment.
- i) Mismatch by type of skills: a person in employment is considered as overskilled if they assess that the level of specific type of skills required to perform their job are lower than the level of skills they possess and underskilled if the level of specific type of skills required to perform their job are higher than the level of skills they possess.
The type of skills assessed include but may not be restricted to:
 - (a) job-specific/technical skills,
 - (b) basic skills,
 - (c) transferable skills.
 - ii) Mismatch of overall skills: a person in employment is considered as overskilled if they report having the skills to perform more complex tasks or underskilled if they report that, to competently perform their job, some of their skills need to be further developed.
20. Wherever possible, in addition to the assessment by the person in employment, measurement might be based on the employer’s assessment of skills possessed by the person in employment against the skills required to perform the job, and/or direct assessment of level of proficiency of selected types of skills (e.g. literacy, numeracy and ICT tests might be used).

⁶ Instead of using a threshold, a person’s direct assessment of the match between their field of study and the field of study required to perform the job may be used.

E. ANALYSIS

21. The basic indicators for reporting labour underutilization related to the inadequate use and mismatch of qualifications and skills of persons in employment are headcounts and rates of:
 - persons in employment mismatched by level of education, over and undereducated,
 - persons in employment mismatched by field of study,
 - persons in employment mismatched by both level of education and field of study,
 - persons in employment mismatched by technical skills, over and underskilled,
 - persons in employment mismatched by basic skills, over and underskilled,
 - persons in employment mismatched by transferable skills, over and underskilled.

22. To understand the relationship between qualification and skills mismatches, it might be useful to separately identify and report headcounts and rates for the following groups:
 - persons in employment undereducated but matched/mismatched by type/level of skills,
 - persons in employment overeducated but matched/mismatched by type/level of skills,
 - persons in employment matched by level of education but matched/mismatched by type/level of skills
 - persons in employment mismatched by field of study but matched/mismatched by type/level of skills.⁷

23. To take into account the informal qualifications (i.e. those not recognized by the relevant national education authorities) acquired outside formal learning institutions, it might be useful to separately identify undereducated and/or mismatched by field of study whose length of relevant work experience and/or on-the-job training is above that required for an occupation or occupational group.

24. Additional cross tabulations might be needed to understand the impact of mismatch on unemployment, jobs satisfaction and earnings:
 - To assess the pressure on the labour market exerted by persons in employment who are mismatched, it may be useful to identify separately mismatched persons in employment who carried out activities to seek “better-matched job” in a recent period that may comprise the last four weeks or calendar month.
 - To assess the impact of mismatch on job satisfaction, it may be useful to identify separately mismatched persons in employment who are unsatisfied with their job (match).
 - To assess the impact of mismatch on earnings, it may be useful to identify separately mismatched persons in employment who are earning less/more than the average wage of their occupational, skills or qualification peers.

25. The analysis of persons in employment who are mismatched may include their disaggregation by significant demographic, social and economic characteristics (such as gender, age, economic activity, sector, occupation, level of education, status in employment, migrant vs non-migrant workers, etc.), as well as appropriate cross-classifications with due regard to the need for confidentiality and statistical significance.

26. The analysis may focus on occupational groups or sectors (e.g. formal/informal, employees, public/private) or age cohorts that are of particular policy interest. The occupational groups of interest may include occupations that require higher levels of education, occupations in which the matching is low, occupations for which there is short supply (e.g. medical staff). The age

⁷ Other combinations might also be of interest.

cohorts of special interest may include youth (e.g. age 15-29), those entering employment in the preceding 5 years, the elderly, etc.

F. DISSEMINATION

27. For effective policies and programmes related to education and skills development, statistics on qualification and skill mismatches should be collected and disseminated at regular intervals, wherever possible on an annual basis.

G. FUTURE WORK

28. The ILO should, in collaboration with interested countries, international, regional and sub-regional organizations, and workers' and employers' representatives:
 - arrange for testing of the concepts and measurement approaches presented in these guidelines,
 - continue methodological work in reference to these guidelines and report to future sessions of International Conference of Labour Statisticians, as appropriate.