# 20th ICLS

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

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# Background

Rapid changes in labour markets, globalization, labour migration, technological change and demographic change

Skill development and skill utilisation issue of particular policy concern in both developed and developing countries

Importance and implications for economic and social development emphasized in SDGs on education and employment

ILO Global Commission on THE FUTURE OF WORK

## Definitions used

- The concept of skill mismatch has not been precisely defined and measurement methodology universally agreed as yet.

- **Variety of concepts**

    skill gaps                     skill shortages          skill mismatch
                 education mismatch          qualification mismatch
        skill obsolesce

                              on-he-job skill mismatch

*Some terms used interchangeably*

- **Variety of skills taxonomies**
- **Variety of measurement approaches**

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# Historical background

Measurement of skills underutilisation has been discussed by 9th, 11th, 16th, 18th, and 19th ICLS

No operational definition or methods for measuring the inadequate employment related to skills

19th ICLS resolution focusses on issues of **insufficient** labour absorption

- The measurement of labour underutilisation limited to (a) time-related underemployment, (b) unemployment, and (c) potential labour force.
- Other dimensions of labour underutilization that refer to **inadequate** labour absorption (e.g. inadequate use and mismatch of occupational skills; and inadequate income in current job), are mentioned but not defined.
- ILO was requested to continue its methodological work *on the measurement of labour underutilization or inadequate employment related to skills, to employment-related income, and to excessive working time*
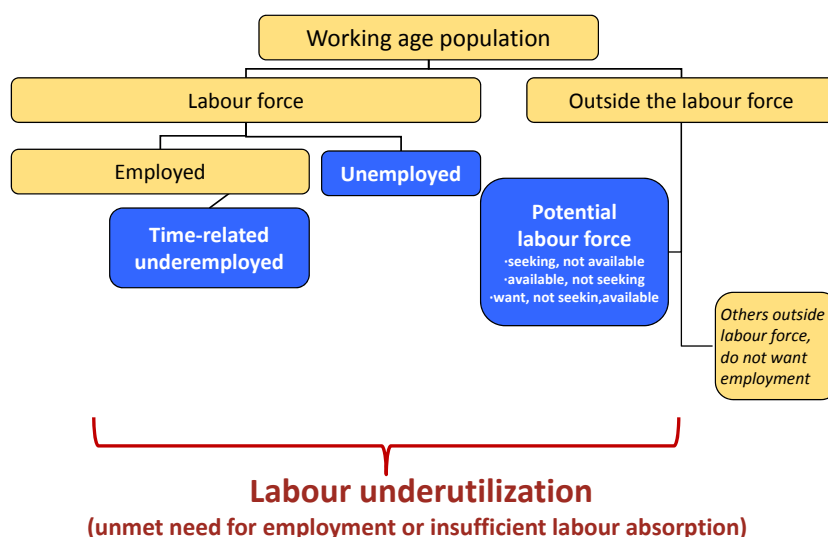
# 19th ICLS Labour underutilization



Working age population

Labour force / Outside the labour force

Employed / Unemployed

Time-related underemployed

Potential labour force
·seeking, not available
·available, not seeking
·want, not seekin,available

Others outside labour force, do not want employment

**Labour underutilization**
**(unmet need for employment or insufficient labour absorption)**

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# 19th ICLS Labour underutilization and inadequate labour absorption
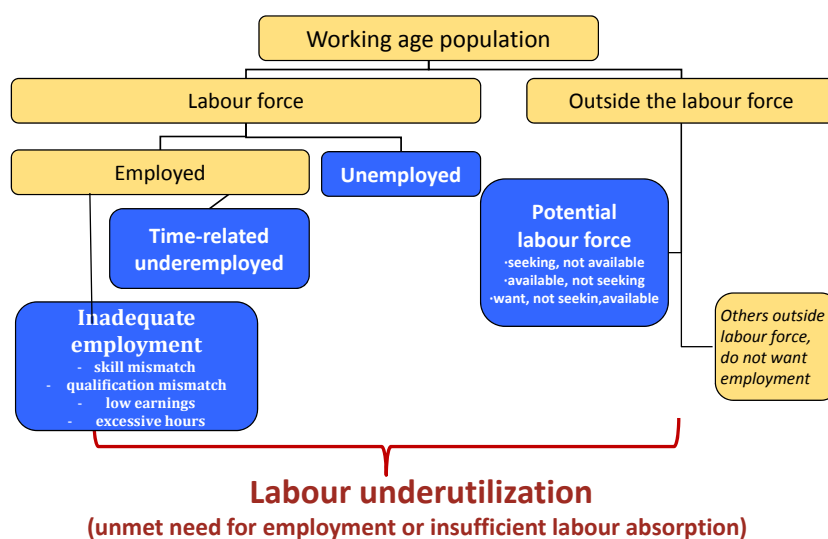


Working age population

Labour force / Outside the labour force

Employed / Unemployed

Time-related underemployed

Inadequate employment
- skill mismatch
- qualification mismatch
- low earnings
- excessive hours

Potential labour force
·seeking, not available
·available, not seeking
·want, not seekin,available

Others outside labour force, do not want employment

**Labour underutilization**
**(unmet need for employment or insufficient labour absorption)**

# Supply and demand of skills

| Suppliers | Skills utilisation | Demanders |
|---|---|---|
| • Unemployed<br>• **Employed**<br>• Working age population outside the labour force | | • Employers (+ Own-account workers+ Hhs) |
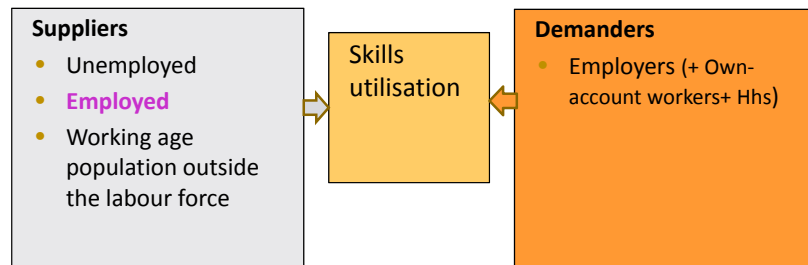
# Development of draft guidelines

Based on

- methodological work undertaken in a number of member countries , OECD and the European Centre for the Development of Vocational Training
- existing standards related to labour statistics and education statistics

Consultations

Technical expert meeting on the measurement of inadequate employment related to skills (Sept.2017)

# Main purposes of guidelines

- To provide a conceptual framework for statistics on the qualification and skill mismatches of **persons in employment**
- To provide guidelines of best practice in the measurement of various types of mismatches at national level; and
- To provide the basis for the production of internationally comparable statistics on the topic.

# Points for discussion

- the usefulness and importance of measuring qualification and skill mismatches;
- the relevance of making a distinction between qualifications and skills ;
- the suitability and relevance of the proposed statistical definitions of qualification and skill mismatches ;
- the suitability and relevance of the proposed measurement approaches;
- the feasibility of measuring skill mismatch in statistical surveys;
- the future steps to be taken in developing relevant international statistical standards on this topic.
- the possibility of adopting the draft guidelines as a set of international statistical guidelines.
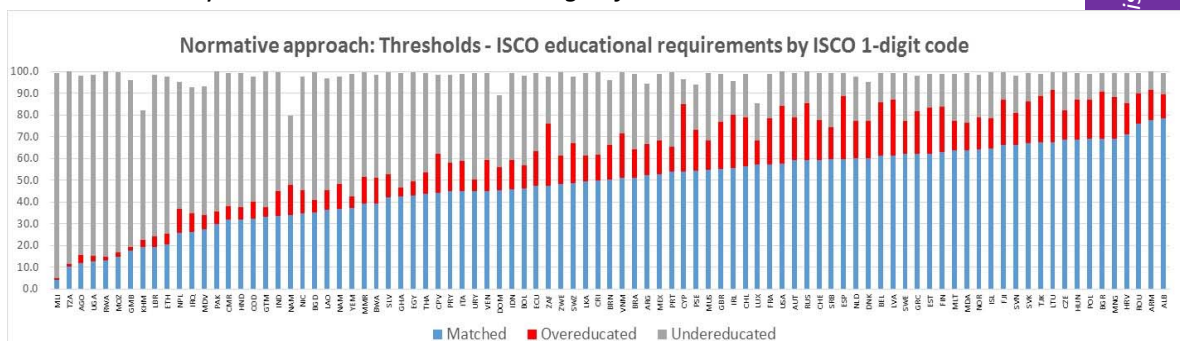
# OBJECTIVES AND USES

## Reasons for measuring qualification and skill mismatches?

**Qualification and skills have a large impact on individuals' labour market outcomes**

- Signifies poor utilization of human capital
- If persistent - Negative consequences and potential cost:
  - ❖ For workers (for overeducated and overskilled) - lower wages lower job satisfaction, loss of motivation, higher on-the-job search, higher the risk of being out of employment, unrealized expectations, lower returns on investment in education,
  - ❖ For employers – lost productivity, increased absenteeism, higher turnover, lower growth, less innovation
  - ❖ For society - wasted education costs, higher unemployment benefits, lost income tax revenues
- Total cost depends on (i) the number of mismatched individuals (ii) the type and severity of mismatches (not all types of mismatches are costly nor undesirable)

## How much mismatch is there?

Mismatch by level of education. *Percentage of workers mismatched*



Normative approach: Thresholds - ISCO educational requirements by ISCO 1-digit code

Matched  Overeducated  Undereducated

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## What is the effect of education and field-of-study mismatch on wages?

*Percentage difference in wages between overeducated or field-of-study mismatched workers and their well-matched counterparts*



Overeducated
(Ref: same level of education, well-matched job)

Field-of-study mismatched
(Ref: same field of study, well-matched job)
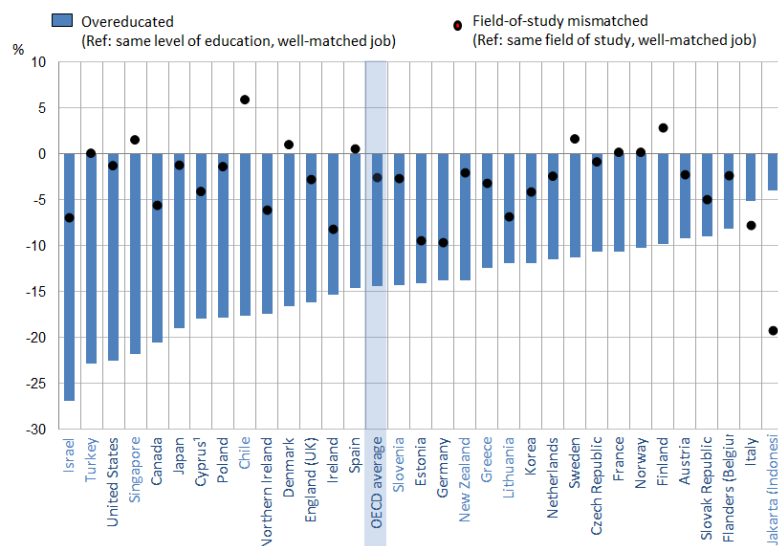
**OECD countries**

- Overeducated: Average wage penalty of 14 percent.

- Field of study mismatch: No significant penalty.

Source: OECD Survey of Adult Skills (PIAAC) (2012, 2015), Table A5.12.

## USES

Statistics on the types, levels and trends of qualification and skill mismatches essential for macroeconomic and human resources development planning and policy formulation;

- To design, implement and evaluatr 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;
- To evaluate the relationship between level of education, field of study and skills on the one hand, and economic and social outcomes, including labour productivity, on the other;
- To 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.

## Main  policy questions

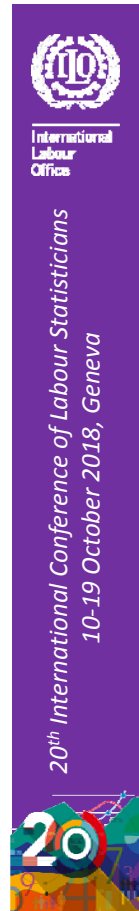- What is the qualification and  skill profile of the evolving job structure by industry and occupation?
- How many and which jobs require what qualifications and levels of various skills?
- What skills are required/lacking in the labour market? Which skills are more important to develop? Which levels and fields of education programmes should be revised so that the education and training systems can equip people appropriately?
- Is there a need for introduction of adult retraining programs in some fields (Remedial training for workers with "skill deficits")? How to make training and learning opportunities more inclusive?
- What are the effects of qualifications and skills mismatches on wages and other outcomes (e.g., job satisfaction, promotion opportunities, layoffs)?
- What are **the trends** in qualification and skill requirements?
- What is **the impact of changes** in qualification and skill level on labour outcomes?
- How to compare a country with others or over time?
- Which population groups, such as women and men, young people, older workers, labour migrants, persons with disabilities and other groups of particular policy concern, are most affected by various forms of mismatches?
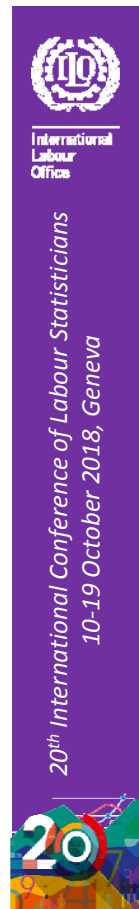
## Objectives

a) to assess the extent to which the qualifications and skills of persons in employment correspond to the requiremets by their jobs;
b) to identify qualification and skill deficits resulting from ongoing technical, structural and demographic changes in the economy;
c) to identify qualification and skill surpluses and workers whose skills and qualifications exceed those required by the job; and
d) to identify the causes and consequences of both qualification and skills mismatches (over- and under-)

## DEFINITIONS

## ANALYTICAL FRAMEWORK:
## Qualifications and Skills
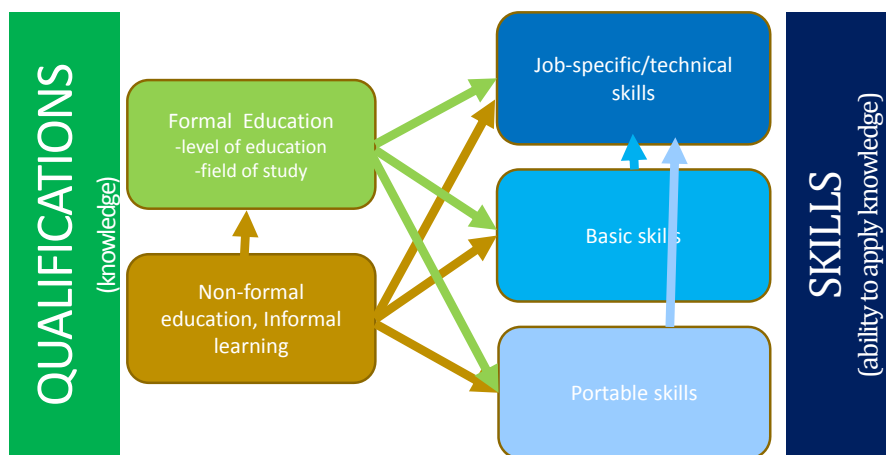


**QUALIFICATIONS** (knowledge)

Formal Education
-level of education
-field of study

Non-formal education, Informal learning

Job-specific/technical skills

Basic skills

Portable skills

**SKILLS** (ability to apply knowledge)

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## QUALIFICATIONS

**QUALIFICATIONS**

Formal Education
-level of education
-field of study

Non-formal education, Informal learning

**Formal qualifications:** official confirmation
i)   Successful completion of a full education programme;
ii)  Successful completion of a stage of an education programme (intermediate qualifications); or
iii) Validation of knowledge, skills and competencies acquired through non-formal education or informal learning.

**Non-formal qualifications:** not officially recognised as equivalent to formal qualifications
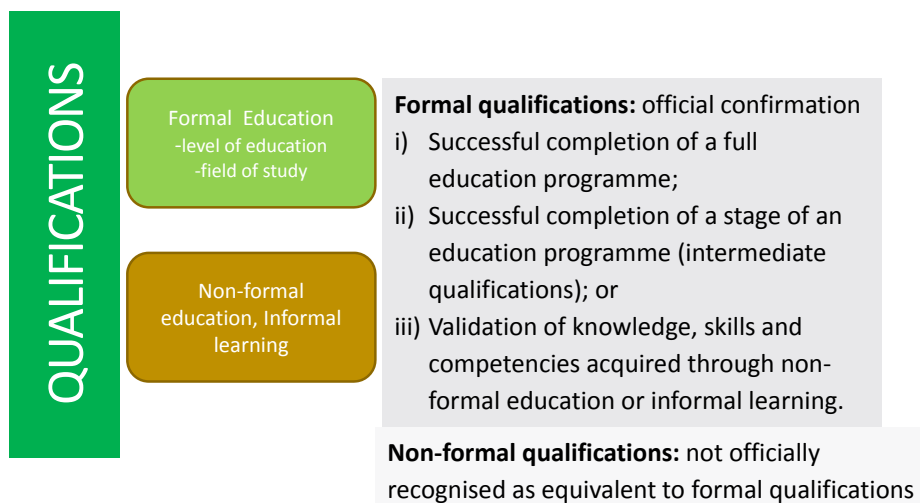
## SKILLS

The innate or learned **ability to apply** the knowledge acquired through experience, study, practice or instruction, and **to perform** tasks and duties required by a given job

Job-specific/technical skills

Basic skills

Portable skills

SKILLS

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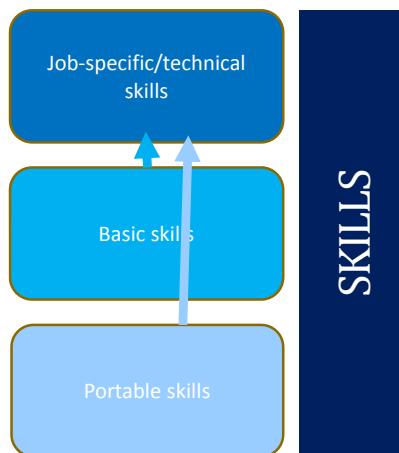
## SKILLS: Types

- Relate specifically to certain types of jobs or job fields
- Easily recognizable and observable
- Difficult to transfer from job to job

- Prerequisite for further education and training, and for acquiring transferable and technical and vocational skills

- Relevant to a broad range of jobs and occupations
- Can be easily transferred from one environment to another

Job-specific/technical skills

Basic skills

Portable skills

SKILLS

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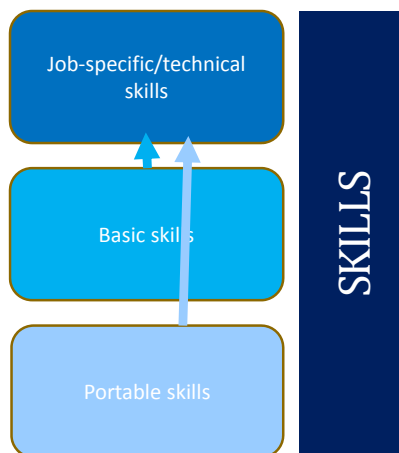
## SKILLS: Types (examples)

- Specialist knowledge needed to perform job duties
- Knowledge of particular products or services produced
- Ability of operating specialized technical tools and machinery
- Knowledge of materials worked on or with

- Writing and reading skills
- Numeracy skills
- ICT skills

- Problem-solving and other cognitive skills
- Physical skills
- Language skills
- Socio-emotional skills
- Personal behavioural skills
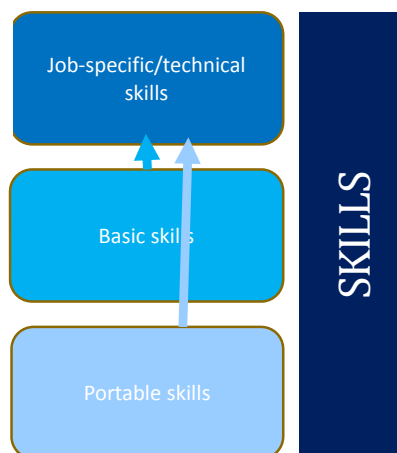
Job-specific/technical skills

Basic skills

Portable skills

**SKILLS**

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## Job specific/technical skills – ISCO 08 skill specialisation

- *In ISCO 08, skill specialisation* is considered in terms of four concepts:
  - the field of knowledge required
  - the tools and machinery used
  - the materials worked on or with: and
  - the kinds of goods and services produced.

# SKILLS: Levels

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.

- ❖ Low level
- ❖ Moderate level
- ❖ High/advanced level
- ❖ None
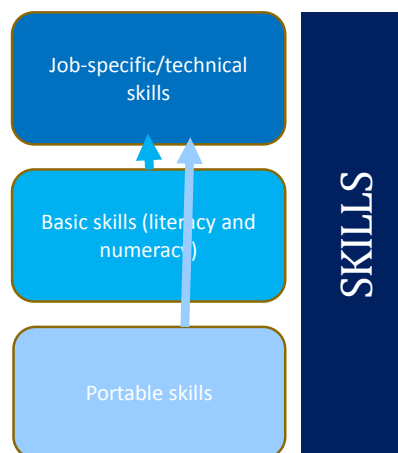
Job-specific/technical skills

Basic skills (literacy and numeracy)

Portable skills

SKILLS

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# SKILLS: Levels – ISCO 08

| ISCO 08 Occupation | Skill level | Formal education required ISCED 2011 | Soft skills required | Work experience/Training required |
|---|---|---|---|---|
| Managers | 3, 4 | 5, 6, 7, 8 | Extended levels of literacy/numeracy, Excellent interpersonal communication skills Problem-solving, decision-making and creativity | Extensive experience and on-the-job training |
| Professionals | 4 | 6, 7, 8 | | |
| Technicians and Associate Professionals | 3 | 5 | High level of literacy and numeracy, Well-developed interpersonal communication skills | Extensive experience and prolonged on-the-job training |
| Clerical Support Workers | 2 | 2, 3, 4 | Moderate literacy and numeracy, Good interpersonal communication skill Manual dexterity | On-the-job training |
| Services and Sales Workers | 2 | 2, 3, 4 | | |
| Skilled Agricultural, Forestry and Fishery Workers | 2 | 2, 3, 4 | | |
| Craft and Related Trades Workers | 2 | 2, 3, 4 | | |
| Plant and Machine Operators and Assemblers | 2 | 2, 3, 4 | | |
| Elementary Occupations | 1 | 1 | Basic literacy and numeracy Physical strength and/or endurance | Short period of on-the-job training |

# CONCEPTS

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## Mismatch of persons in employment*
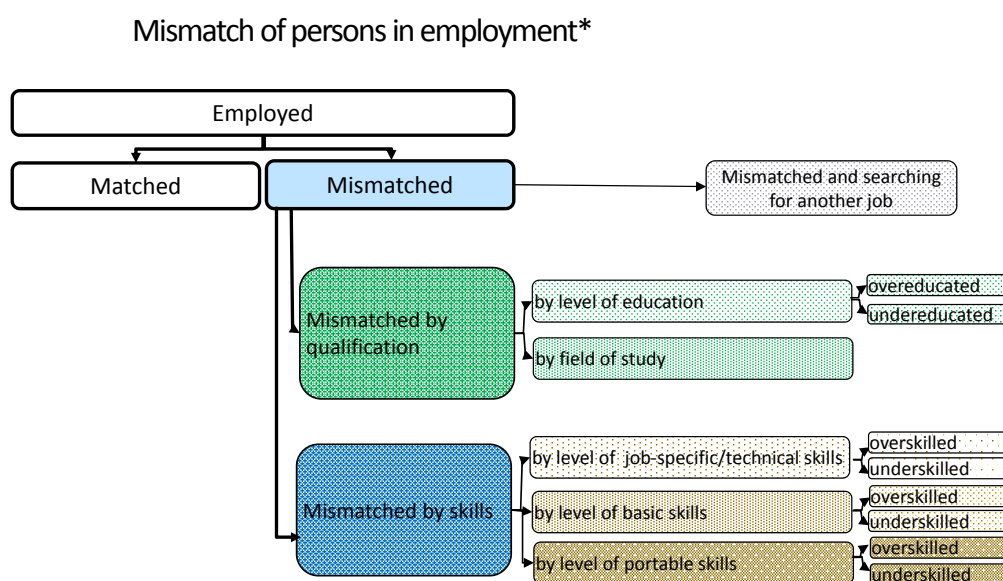


*Based on requirements of the main job (where relevant, on the basis of requirements of other jobs)

## Qualification mismatch of persons in employment – Concept

**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

(a) Mismatch by level of education

- Over-qualification - level of education is higher
- Under-qualification - level of education is lower

(b) Mismatch by field of study

- Field-of-study mismatch – field of education/study does not correspond to the field of study required to do the job

## Skill mismatch of persons in employment - Concept

**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 possessed.

**Mismatch of overall skills**

**Mismatch by types of skills**

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

- Overskilling - level of skill is higher
- Underskilling - level of skill is lower

# MEASUREMENT

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## Qualification mismatch - Measurement

(a) Mismatch by level of education (based on level of education, occupation, relevance of different levels of education to each occupation or occupational group).

❖ **Normative approach -** educational requirements set for specific occupations or occupational groups
❖ **Statistical approach -** modal level of education of all persons in employment in an occupation or occupational group (or years of schooling)
❖ **Subjective approach -** based on person's self-perceived match between his/her qualification and the qualification required by the job
○ *Intensity (severity) of mismatch may be estimated*

(b) Mismatch by field of study (based on field of study, occupation, relevance of different fields of study to each occupation or occupational group).

❖ **Normative approach**
❖ **Statistical approach**
❖ **Subjective approach**

## Qualification mismatch - Measurement

(a) Mismatch by level of education

(b) Mismatch by field of study

❖ **Normative approach -** More accurate as based on expertise but expensive to keep it up-to-date

❖ **Statistical approach -** Easy to apply, no additional questions required but depends on the changes in the distribution over time

❖ **Subjective approach -** Easy to apply but subjective (?)

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## Qualification mismatch - Measurement

❖ **Subjective approach**

▪ **Direct approach -** A person in employment is considered to be overeducated/undereducated if they report having a level of education that is higher/lower than that required to perform their current job

▪ **Indirect approach-** A person in employment is considered to be overeducated/undereducated if their level of education is above/below the modal value of the self-reported level of education appropriate to get the job or to perform the job reported by all workers in the same occupation or occupational group. *(recommended)*

## Comparison of methods
### Mismatch by level of education

Normative approach: Thresholds - ISCO educational requirements by ISCO 1-digit code

Statistical Approach: Thresholds - Modal ISCED level of education by ISCO 2-digit code

Matched | Overeducated | Undereducated



## Comparison of methods
### Mismatch by level of education

MOLDOVA, LFS

Undereducated

Overeducated

Matched by level of education but mismatched by field of study

Matched by level of education

Normative (2017) | Subjective (2017 Q1)

**Normative:** ISCO educational requirements by ISCO 1-digit code

**Subjective:** Self-perceived (direct approach)

ARMENIA, LFS

Undereducated

Overeducated

Matched by level of education

Normative (2016) | Subjective (2014)

*Comparison of methods*

**Mismatch by level of education over time**

**Normative:** ISCO educational requirements by ISCO 1-digit code    **Statistical:** Modal ISCED level of education by ISCO 2-digit code
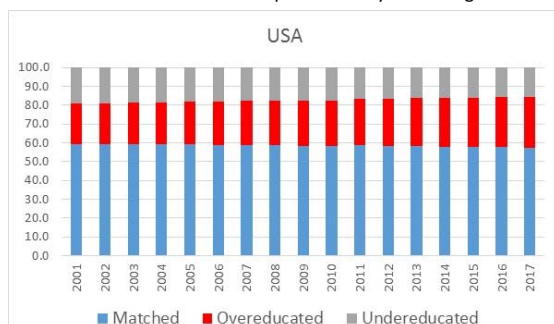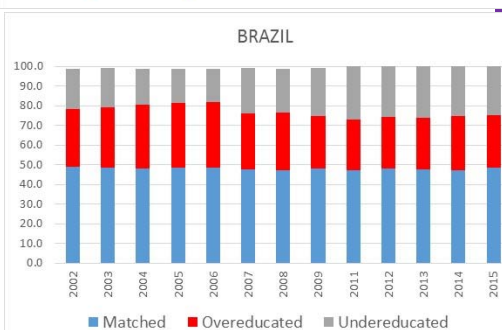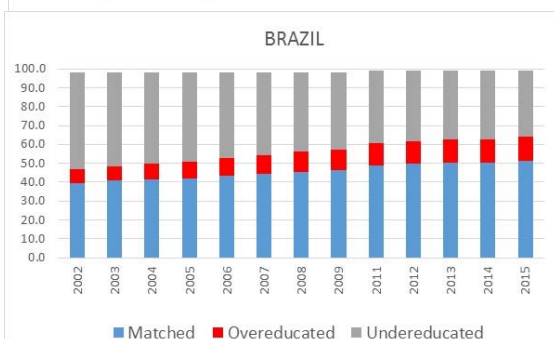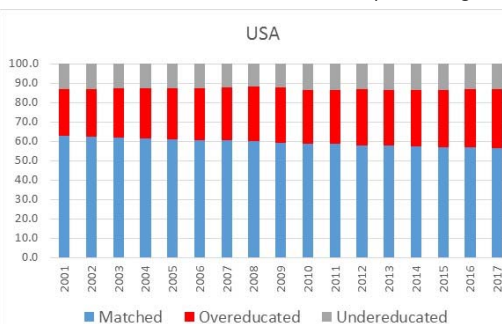


*Comparison of methods*

**Mismatch by level of education over time**

**Normative:** ISCO educational requirements by ISCO 1-digit code    **Statistical:** Modal ISCED level of education by ISCO 2-digit code

## Skill mismatch – Measurement
- overall skills
- specific types of skills

**Worker measures:** person's self-perceived match between his/her level and/or type of skills and the skills required by the job.

*Is the job fit for the worker's skills?*

**Employer measures:** employer's assessment of skills possessed (and used on the job) against the skills required.

*Is the worker's skills fit for the job?*

**Direct measures (assessment):** Level of proficiency of selected types of skills is assessed (e.g. literacy, numeracy and ICT tests)



## Skill mismatch – Measurement
**Worker measures:**

i) Specific types of skills (skill as **multi-dimensional** concept)

A person in employment - overskilled/undeskilled if the *level of specific type of skills* required to do their job are lower/higher than the level of skills they possess

ii) Overall skills (skill as **uni-dimensional** concept)

A person in employment - overskilled if they assesses having the skills to perform more complex tasks or underskilled if they report that, for competent performance at the job, some of their skills need to be further developed.

## ii) Overall skills

➢ **Overall, how would you/… best describe your skills in relation to what is required to do your/… job?**

I have skills to cope with more demanding duties …………………………….....1

My skills are matched to what is required by my job …………………………..2

Some of my skills need to be further developed to cope with my duties….3

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## i) Specific types of skills

➢ **Which level of skills is required to competently do your/… job?**

a) Job-specific/Technical skills

b) Literacy (writing and reading) skills

c) Numeracy skills

d) Information Communication Technology (computer use) skills

e) Other skills (e.g. Learning skills, Interpersonal Communication skills, Team-working skills, Customer handling skills, Planning and organisation skills, etc.)

f) Physical strength

*Options*
- Low level of skill required ……………………1
- Moderate level of skill required ……………2
- High/advanced level of skill required…….3
- Skill is not required……………………………88

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## Skill mismatch – Measurement
### Worker measures: Survey questions

#### i) Specific types of skills

➢ **Which level of skills is required to competently do your/… job?**

a) Job-specific/Technical skills

b) Literacy (writing and reading) skills

c) Numeracy skills

d) Information Communication Technology (computer use) skills

e) Other skills (e.g. Learning skills, Interpersonal Communication skills, Team-working skills, Customer handling skills, Planning and organisation skills, etc.)

f) Physical strength

*Options*
- Low level of skill required ……………………1
- Moderate level of skill required ……………2
- High/advanced level of skill required…….3
- Skill is not required………………….…………88

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➢ **How would you best describe your skills in relation to what is required to do your job? (if 1-3)**
   *Options*
   - lower
   - matched
   - higher

## ANALYSIS

## Indicators: Headcounts and rates

- mismatched by level of education, over and undereducated
- mismatched by field of study
- mismatched by both level of education and field of study
- mismatched by technical skills, over and underskilled
- mismatched by basic skills, over and underskilled
- mismatched by portable skills, over and underskilled

## Relationship between qualification and skills mismatches

- undereducated but matched/mismatched by type/level of skills
- overeducated but matched/mismatched by type/level of skills
- matched by level of education but matched/mismatched by type/level of skills
- mismatched by field of study but matched/mismatched by type/level of skills
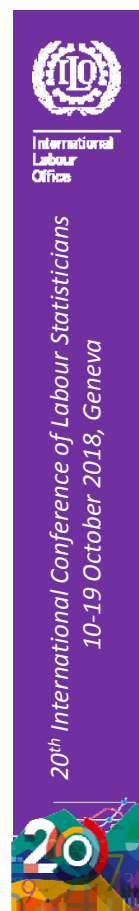
## Informal qualifications

- Undereducated
- 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
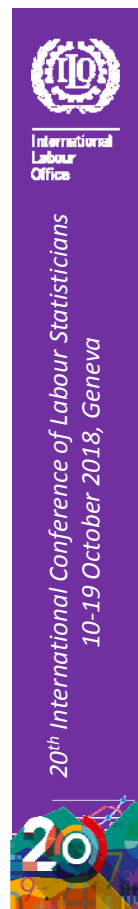
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## Impact of mismatch on unemployment, jobs satisfaction and earnings

Mismatched persons in employment who
- carried out activities to seek "better-matched job" (want to change their job)
- not satisfied with their job/match
- earning less/more than the average wage of their occupational, skills or qualifications peers

## Persons in employment of special interest

- formal/informal sector
- employees
- public/private sector
- occupational groups that require higher levels of education or in which the matching is low or supply is short
- specific age cohorts (e.g. age 15-29, elderly, those entering employment in the preceding 5 years)

## Disaggregations

By demographic, social and economic characteristics (gender, age, economic activity, sector, occupation, level of education, status in employment, migrant vs non-migrant workers, etc.)

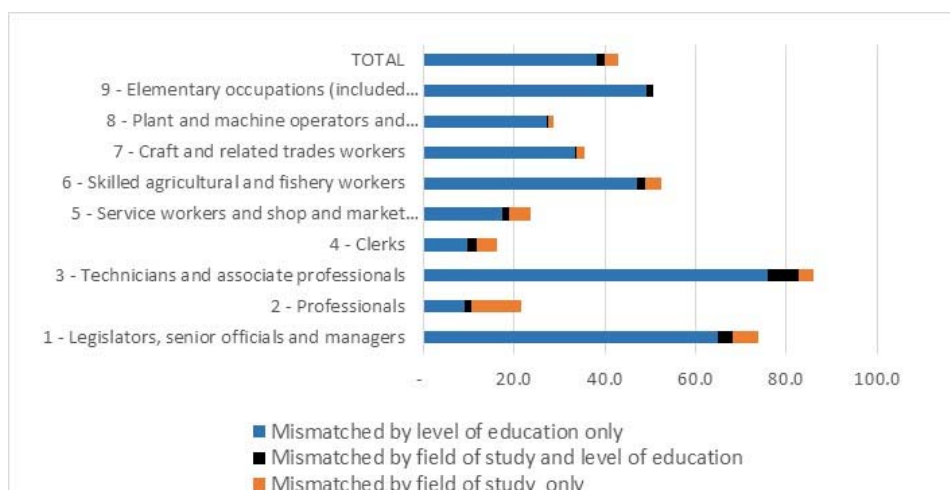- Considerations for need for confidentiality and statistical significance

## Disaggregations

**Incidence of mismatch by level of education and field of study (normative) , by occupation, %**
South Africa, All persons employed, LFS 2015 Q3



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## DISSEMINATION

For effective qualification and skills policy interventions, statistics on qualification and skill mismatches should be collected and disseminated at regular intervals, wherever possible on an annual basis.

# FUTURE WORK

## Future work

ILO should

- arrange for testing the concepts and measurement approaches presented in the guidelines
- continue methodological work in reference to these guidelines, and report to future sessions of ICLS

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*20th International Conference of Labour Statisticians*
*10-19 October 2018, Geneva*