

International Standard Classification of Occupations (ISCO-08) – Conceptual Framework

Draft for consultation through second questionnaire on updating ISCO-88

Introduction

1 This paper describes the framework and conceptual model that has been agreed by members of the Technical Expert Group for Updating ISCO as the basis for the design of ISCO-08. Since ISCO-08 is an update rather than a major revision, the framework and the concepts underpinning it are essentially unchanged from those used in the previous version of ISCO (ISCO-88)¹.

2 The definitions of these concepts have been updated and guidelines for their application to the design of the classification have been strengthened and clarified, however, where this was necessary to address known deficiencies in ISCO-88. The most significant aspect of these improvements reflects the principle that occupations that involve the performance of the same tasks should always be classified in the same place in ISCO, even when the formal educational qualifications required or held may differ from one country to another or from one individual to another.

3 The main purpose of this paper is to assist those preparing responses to the second (consultative) questionnaire on updating ISCO, particularly those relating to the measurement of skill level. It also provides background information which may help explain the logic of some of the changes proposed to ISCO in the draft updated ISCO-08 structure to be circulated for comment in mid 2006.

4 Comments on the content and clarity of this paper will be most welcome and should be sent to ISCO@ilo.org.

Underlying concepts

5 The framework used for the design and construction of ISCO-08 is based on two main concepts: the concept of the kind of work performed or *job*, and the concept of *skill*.

Definitions of *job* and *occupation*

6 A *Job* is defined in ISCO-08 as a ‘set of tasks and duties carried out, or meant to be carried out, by one person for a particular employer, including self employment.’

7 An *occupation* is defined as a *set of jobs* whose main tasks and duties are characterised by a high degree of similarity. A person may be associated with an occupation through the main job currently held, a second job or a job previously held.

¹ ILO, 1990

Skill

8. *Skill* is defined as the ability to carry out the tasks and duties of a given job. For the purposes of ISCO-88, two dimensions of skill are used to arrange occupations into groups. These are *skill level* and *skill specialisation*.

Skill level

9 *Skill level* is defined as a function of the complexity and range of tasks and duties to be performed in an occupation. Skill level is measured operationally by considering one or more of:

- the nature of the work performed in an occupation in relation to the characteristic tasks and duties defined for each ISCO-88 skill level;
- the level of formal education defined in terms of the International Standard Classification of Education (ISCED-97)² required for competent performance of the tasks and duties involved; and
- the amount of informal on-the-job training and /or previous experience in a related occupation required for competent performance of these tasks and duties.

Skill Specialisation

10 The concept of skill level is applied mainly at the top (major group) level of the classification. This means that, eight of the ten major groups in ISCO-08 contain occupations only at one of four skill levels. For example, ISCO Major Group 2, Professionals only includes occupations at the highest ISCO skill level, Skill Level 4.

11 *Skill specialisation* is considered in terms of four conceptual 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.

12 Within each major group occupations are arranged into unit groups, minor groups and sub-major groups, primarily on the basis of aspects of skill specialisation. In the case of ISCO-08 Major Group 1, Managers, senior official and legislators, and Major Group 0, Military occupations, the concept of skill level is applied primarily at the second hierarchical level.

Definitions of the four ISCO skill levels

13 Definitions of each of the four ISCO skill levels are provided below. These definitions do not change the boundaries between the skill levels used in ISCO-88.

² UNESCO, 1997

They serve to clarify these boundaries and to deal with cases where formal educational requirements may not be the most suitable method of measuring the skill level of a particular occupation. Each definition provides examples of

- the typical or characteristic tasks performed at each skill level,
- the types of skill required (in broad terms), and
- the typical occupations classified at that skill level

Skill Level 1

14 Occupations at Skill Level 1 typically require the performance of simple and routine physical or manual tasks. They may require the use of hand held tools, such as shovels, or of simple electrical equipment, such as vacuum cleaners. They involve tasks such as cleaning; digging; lifting and carrying materials by hand; sorting, storing or assembling goods by hand (sometimes in the context of mechanised operations); operating non-motorised vehicles; and picking fruit and vegetables.

15 Many occupations at Skill Level 1 may require physical strength and/or endurance. For some jobs basic skills in literacy and numeracy may be required. If required these skills would not be a major part of the job.

16 For competent performance in some occupations at Skill Level 1, completion of primary education or the first stage of basic education (ISCED Level 1) may be required. A short period of on-the-job training may be required for some jobs.

17 Occupations classified at Skill Level 1 include office cleaners, freight handlers, garden labourers and kitchen assistants

Skill Level 2

18 Occupations at Skill Level 2 typically involve the performance of tasks such as operating machinery and electronic equipment; driving vehicles; maintenance and repair of electrical and mechanical equipment; and manipulation, ordering and storage of information.

19 For almost all occupations at Skill Level 2 the ability to read information such as safety instructions, to make written records of work completed, and to accurately perform simple arithmetical calculations is essential. Many occupations at this skill level require relatively advanced literacy and numeracy skills and good interpersonal communication skills. In some occupations these skills are required for a major part of the work. Many occupations at this skill level require a high level of manual dexterity.

20 The knowledge and skills required for competent performance in all occupations at Skill Level 2 are generally obtained through completion of the first stage of secondary education (ISCED Level 2). Some occupations require the completion of the second stage of secondary education (ISCED Level 3), which may include a significant component of specialised vocational education and on-the-job training. Some occupations require completion of vocation specific education

undertaken after completion of secondary education (ISCED Level 4). In some cases experience and on the job training may substitute for the formal education.

21 Occupations classified at Skill Level 2 include butchers, bus drivers, secretaries, accounts clerks, sewing machinists, dressmakers, shop sales assistants, police officers, hairdressers, building electricians and motor vehicle mechanics.

Skill Level 3

22 Occupations at Skill Level 3 typically involve the performance of complex technical and practical tasks which require an extensive body of factual, technical and procedural knowledge in a specialised field.

23 Occupations at this skill level generally require a high level of literacy and numeracy and well developed interpersonal communication skills. These skills may include the ability to understand complex written material, prepare factual reports and communicate with people who are distressed.

24 The knowledge and skills required at Skill Level 3 are usually obtained as the result of study at a higher educational institution following completion of secondary education for a period of 1 – 3 years (ISCED Level 5b). In some cases extensive relevant work experience and prolonged on the job training may substitute for the formal education.

25 Occupations classified at Skill Level 3 include shop managers, medical laboratory technicians, legal secretaries, commercial sales representatives, computer support technicians, and broadcasting and recording technicians.

Skill Level 4

26 Occupations at Skill Level 4 typically involve the performance of tasks which require complex problem solving and decision making based on an extensive body of theoretical and factual knowledge in a specialised field. The tasks performed typically include analysis and research to extend the body of human knowledge in a particular field, diagnosis and treatment of disease, imparting knowledge to others, design of structures or machinery and of processes for construction and production.

27 Occupations at this skill level generally require extended levels of literacy and numeracy, sometimes at a very high level, and excellent interpersonal communication skills. These skills generally include the ability to understand complex written material and communicate complex ideas in media such as books, reports and oral presentations.

28 The knowledge and skills required at Skill Level 4 are usually obtained as the result of study at a higher educational institution for a period of 3 – 6 years leading to the award of a first degree or higher qualification (ISCED Level 5a or higher). In some cases experience and on the job training may substitute for the formal education. In many cases appropriate formal qualifications are an essential requirement for entry to the occupation.

29 Occupations classified at Skill Level 4 include sales and marketing managers, civil engineers, secondary school teachers, medical practitioners, operating theatre nurses and computer systems analysts.

Application of the 4 skill levels to the ISCO major groups

30 The relationship between the ten ISCO-08 major groups and the four ISCO-08 skill levels is summarised below in Table 1. Within Major group 1, occupations in Sub-major group 14, Hospitality, retail and service managers are at Skill Level 3. All other occupations in Major group 1 are at Skill Level 4. Within Major group 0, Military occupations, occupations in Sub-major group 01, Military officers are at Skill Level 4. All other occupations in Major group 0 are at Skill Level 1.³

Table 1

Mapping of ISCO-08 major groups to skill levels

ISCO-08 major groups	Skill Level
1 – Managers, senior officials and legislators,	3 + 4
2 - Professionals	4
3 - Technicians and associate professionals	3
4 - Clerks 5 - Service and sales workers 6 - Skilled agricultural and fishery workers 7 - Craft and related trades workers 8 - Plant and machine operators, and assemblers	2
9 - Elementary occupations	1
0 – Military occupations	1 + 4

31 In those cases where formal education and training requirements are used as part of the measurement of the skill level of an occupation, these requirements are defined in terms of the International Standard Classification of Education (ISCED). A mapping between ISCO skill levels and levels of education in ISCED 97 is provided below in Table 2.

³ It should be noted that only occupations specific to military forces (excluding police) are included in Major group 0. Thus, jobs in the armed forces that have equivalents in civilian employment are classified in the appropriate ISCO category (that is as truck drivers, radio operators etc).

Table 2

Mapping of the four ISCO-08 skill levels to ISCED-97 levels of education

ISCO-88 Skill Level	ISCED-97 groups
4	6 - Second stage of tertiary education (leading to an advanced research qualification) 5a - First stage of tertiary education, 1st degree (medium duration)
3	5b - First stage of tertiary education (short or medium duration)
2	4 - Post-secondary, non-tertiary education 3 - Upper secondary level of education 2 - Lower secondary level of education
1	1 - Primary level of education

32 It should be stressed that the formal education and training requirements are only one component of the measurement of skill level and should be seen as indicative only. The most important determinant of skill level is the nature of the tasks performed in a particular occupation in relation to the characteristic tasks defined for each skill level. It is not necessary for a person to hold qualifications at a particular level in order for their job to be classified at a particular ISCO skill level.

Occupations for which formal education requirements differ between countries

33 A significant problem regarding the application of the concept of “Skill level” in ISCO-88 relates to occupations with the similar tasks and duties (or content) but with a different (higher or lower) “skill level” requirement, as measured in particular countries. This is because, given realistic differences in national education systems, the same occupation (with the same set of tasks and duties), can be undertaken by individuals with different educational levels without affecting the level of skill required for competent performance of the tasks. This is the case for some elementary, craft and technical occupations, which in many countries require higher education levels, than those assigned in ISCO-88.

34. The ISCO-88 guidelines recommend that occupations with higher or lower skill requirements than those assigned in ISCO-88 should be classified to the major group corresponding to the skill level that such jobs require in the country. There has been widespread concern, however, that this approach reduces international comparability as occupations with similar content in terms of the tasks performed have been classified in different ISCO-88 major groups depending on the country.

35 Two of the most obvious cases where this is a problem in ISCO-88, relate to the treatment of *Nurses* and *Primary and Pre-primary teachers*. In some countries, nurses and teachers require a University degree while in others they do not. At the time when ISCO-88 was being adopted, this situation was resolved by assigning these occupations to two parallel minor groups, one in Major group 2 and another in Major group 3. These occupational groups were to be used alternatively, that is, countries were to classify all teachers and all nurses either in Major group 2 or in Major group 3 except in cases where there were real differences in the tasks and duties performed. Given that ISCO-88 descriptions for both groups of teachers and nurses are identical in both major groups, however, a number of countries have made the distinction between professional and associate professional workers on the basis of the education level of the job holder, and not on the basis of the tasks and duties actually performed.

36 In ISCO-08 job content (i.e. tasks and duties) is given priority over national education and training requirements. In other words, occupations that involve the performance of broadly the same sets of tasks and duties are always classified in the same category in ISCO-08, even in cases where national skill level requirements measured in terms of formal education are different. It is hoped that this will lead to an improvement in international comparability.

37 A set of principles and guidelines has been developed to help decide what skill level should be assigned to occupations when education and training requirements differ among countries. These principles are outlined below and are applied **in order of precedence**.

- a) The complexity and range of the tasks and duties involved in the occupation should be considered in relation to the definitions for each skill level, paying particular reference to the characteristic tasks and duties associated with each skill level.
- b) Where the formal education requirements are different in only a small number of countries then the skill level should be determined on the basis of the requirements that apply in the large majority of countries
- c) Where consideration of (a) and (b) above is inconclusive in distinguishing between Skill Levels 1 & 2 in ISCO, occupations which require completion of the first stage of secondary education in some countries (ISCED Level 2) and completion of primary education only (ISCED Level 1) in other countries should be classified at Skill Level 1. (This approach is taken because, in many highly industrialised countries, completion of the first stage of secondary education is more or less universal. In such circumstances those who have not completed the first stage of secondary education may not be able to find employment in even the most unskilled of jobs.)
- d) Where consideration of (a), (b) and (c) above is inconclusive, the situation that prevails in industrialised countries should generally be used to determine the skill level of an occupation, but only where there is a consistent approach across a clear majority of these countries. For example, if a degree is required for entry to an occupation for less than half of the countries that are members of the Organisation for Economic Cooperation and Development (OECD), but a 2 year diploma is required in most other countries, then it may be appropriate to assign the occupation to Skill Level 3. The size of countries as well as the

number of countries should also be taken into consideration in making judgements of this type.

References and further reading

- BIT (1991): *Classification internationale type des professions (CITP-88)*. Bureau international du travail, Genève.
- Budlender, D. (2003a): *Wither the International Standard Classification of Occupations (ISCO-88)?* Working Paper No. 9, Bureau of Statistics, Policy Integration Department, ILO, Geneva.
- Budlender, D. (2003b): *Improving occupational classifications as tools for describing labour markets: A summary of national experiences*, Working Paper No. 10, Bureau of Statistics, Policy Integration Department, ILO, Geneva.
- Embury B. et al (1997): *Constructing a map of the world of work: How to develop the structure and contents of a national standard classification of occupations*. STAT working paper 95/2. International Labour Office, Geneva.
- Luxembourg Income Study (2005) *The standardization routines for highest level of attained education* referenced at <http://www.lisproject.org/dataaccess/educlevel/educdefcountry.htm>
- Hoffmann E. et al (1995): *What kind of work do you do? Data collection and processing strategies when measuring "occupation" for statistical surveys and administrative records*. STAT working paper 95/1. International Labour Office, Geneva.
- ILO (1990): *International Standard Classification of Occupations (ISCO-88)*. International Labour Office, Geneva.
- ILO (2004): *Report of the Conference*. Seventeenth International Conference of Labour Statisticians, Geneva, 24 November – 3 December 2003. International Labour Office, Geneva.
- OIT (1991): *Clasificación internacional uniforme de ocupaciones (CIUO-88)*. Oficina Internacional del Trabajo, Ginebra.
- UN (2005) *Final report: Meeting of the Expert Group on International Economic and Social Classifications* New York, 20 - 24 June, 2005, Department of Economic and Social Affairs, Statistics Division
- United Nations Statistical Commission (2003) *Report on the thirty-fourth session (4-7 March 2003)*, Economic and Social Council Official Records 2003 Supplement No. 4, United Nations, New York.