

# The International Standard Classification of Education 1997: challenges in the application to national data and the implementation in cross-national surveys

Silke L. Schneider and Irena Kogan

## 1 Introduction

The reporting of international education statistics by large international organisations like the Organisation for Economic Co-operation and Development (OECD) or the United Nations Educational, Scientific and Cultural Organization (UNESCO) has increased considerably in the last 15 years.<sup>1</sup> Such statistics get unprecedented attention by political actors in individual countries, particularly since the quality of the reported data has improved substantially since the 1980s. The development of the OECD's Programme of International Student Assessment (PISA) studies can also be seen as an indicator for the increasing interest in international education benchmarking, focusing on the actual academic performance of 15 year olds (in e.g. reading or mathematics) rather than current enrolments in education or highest educational attainment of the general population. More than ever before, educational systems abroad become an important point of reference for national education policies.

In addition, over the last decades, more and more cross-national survey data sets including more and more countries have become available to researchers.<sup>2</sup> This development gave rise to a previously unequalled popularity of cross-nationally comparative social research. Educational attainment is one of the standard demo-

<sup>1</sup> See e.g. the OECD's now annual "Education at a Glance: OECD Indicators" series of which the first volume was published in 1992 (latest version: OECD, 2007), or the UNESCO's annual "Global Education Digest", published since 2003 (latest version: UNESCO Institute for Statistics, 2007).

<sup>2</sup> See e.g. the Eurobarometer (since 1970; [http://europa.eu.int/comm/public\\_opinion/](http://europa.eu.int/comm/public_opinion/)), the European and World Values Studies (EVS and WVS, since 1981 and 1991 respectively; <http://www.europeanvalues.nl/> and <http://www.worldvaluessurvey.org/>), the International Social Survey Programme (ISSP, since 1983; <http://www.issp.org/>), the European Community Household Panel (ECHP, 1994–2001), the European Union Labour Force Survey (EU-LFS, since 1998), the Programme for International Student Assessment (PISA, since 2000; <http://www.pisa.oecd.org/>), the European Social Survey (ESS, since 2002; [www.europeansocialsurvey.org](http://www.europeansocialsurvey.org)), and the European Union Statistics on Income and Living Conditions (EU-SILC, since 2004). For details on most of these and other cross-national surveys, see Heath et al. (2005).

graphic variables recorded in all cross-national surveys, and is used in most empirical studies either as a main variable (e.g. in social stratification and mobility or labour market research) or as a control variable.

Cross-nationally comparable measurement of educational attainment (and other education related information) is therefore one of the most important challenges of comparative survey research and large-scale statistical reporting. The construction of instruments for the cross-nationally comparable measurement of education however is a very difficult undertaking, since educational systems vary to a substantial degree between different countries and sometimes even between lower level administrative units within countries. Yet, for cross-national research, the educational programmes and qualifications offered have to be systematically mapped to measurement instruments that must be at least functionally equivalent across countries.

However, it is not only the demand for cross-nationally comparable measures of education for statistical reporting and use by survey researchers that has increased, but also the complexity of the task of providing such measures: The structure of educational systems has changed substantially over the last decades. New educational programmes and qualifications have appeared, and the boundaries that have traditionally separated different types of education have weakened (OECD, 1999: 7). The increasing complexity of educational systems, more choice between different types of certificates and many countries' efforts to increase equity in education have imposed additional difficulties for the international comparability of educational programmes and qualifications. Comparability *across time* is therefore another aspect that measures of educational attainment (cross-national or not) have to take into account.

Different user communities have developed different ways of dealing with the problem of cross-nationally comparable measurement of education: the UNESCO introduced the 'International Standard Classification of Education' (ISCED) in 1976, mainly for its own use and that of other statistical agencies, e.g. the OECD. Some social researchers, particularly in the United States, resorted to (sometimes 'virtual') *years of schooling* as a proxy variable for educational attainment (e.g. Treiman and Yip, 1989; Ganzeboom and Treiman, 1993). Others used scaling approaches in order to convert national education categories to a common metric, based on a construct highly correlated with educational attainment (e.g. Treiman and Terrell, 1975; Smith and Garnier, 1987), or on the ordinal distribution of education (Sørensen, 1983). More in line with the UNESCO's approach, a group of European sociologists developed their own classification of educational attainment, the 'CASMIN Educational Classification' (König et al., 1988; Brauns and Steinmann, 1999; Brauns et al., 2003), which was used in a number of seminal cross-national

studies on social stratification and mobility (e.g. Müller et al., 1990; Erikson and Goldthorpe, 1992; Müller and Karle, 1993; Shavit and Müller, 1998).<sup>3</sup>

Structural changes in national education systems as well as a number of insufficiencies of the ISCED have brought about its revision in 1997 ('ISCED-97'). The ISCED-97 marks a significant improvement over the ISCED-76, as it allows one to measure the level and type of education and training in much more detail, and is far better documented. Simplified versions of the ISCED-97 have been implemented in the first large-scale cross-national surveys, e.g. in the PISA studies, the EU-LFS and the ESS.

Although the OECD and UNESCO have used the ISCED-97 extensively over the last ten years for their statistical reports, and although it is increasingly used in cross-national surveys, the validity of the 'new' ISCED has not yet been thoroughly assessed. More particularly, the ISCED-97 was mainly developed for statistical reporting of current enrolments in education, and it is largely unclear if it is equally suitable for measuring educational attainment covering the whole population. Generally speaking, efforts to validate harmonised measures of educational attainment are scarce. The few available studies (Braun and Müller, 1997; Kerckhoff and Dylan, 1999; Kerckhoff et al., 2002) restrict their validation to a small number of countries, evaluate the ISCED-76 rather than the new version, or evaluate other measures of educational attainment than the ISCED.

Therefore, in this book, we conduct an evaluation of the ISCED-97 for 15 European countries. The implementation of the ISCED-97 is examined in detail, for example by checking if the ISCED concepts and criteria are applied as set out in the available documentation, and if important differences between national educational attainment categories are reflected in the ISCED-97. Finally, consistency checks comparing the distribution of educational attainment according to the ISCED-97 in two different data sources, namely large national data sets and the EU-LFS, are performed in all countries but Bulgaria (for lack of appropriate data).<sup>4</sup>

This chapter serves as a general introduction and summarises the results from the 15 countries. Firstly, the ISCED-97 is described in some detail. Then, the synthesised results of the evaluation of the ISCED-97 in the 15 countries covered are presented, highlighting a number of problems that emerge when applying the ISCED-97 to national data. In the final chapter, some suggestions for data collection and coding for

---

<sup>3</sup> For a detailed discussion of these different solutions of measuring educational attainment in a cross-nationally comparable way, see Braun and Müller (1997).

<sup>4</sup> The anonymised EU Labour Force Survey micro-data was provided by Eurostat via the Centre National de la Recherche Scientifique (contract number LFS/2006/10) for use in the EQUALSOC research team "Evaluation of the International Standard Classification of Education (ISCED 1997) for Comparative Research". The results and conclusions are the responsibility of the editor and authors of this book and not those of Eurostat, the European Commission or any of the national authorities whose data have been used.

comparative surveys are made, and an outlook on a possible future revision of the ISCED is given.

## 2 The ISCED-97

In order to compare aspects of education cross-nationally, “it is necessary that the required data become available for the different countries on the basis of an internationally accepted standard classification scheme encompassing all types of educational programmes that a country can possibly have” (UNESCO, 1999: 4). The ISCED is designed to serve as such a scheme, and is supposed to be suitable for assembling and presenting comparable education statistics (on e.g. enrolment and attainment) both within and across countries. The purpose of the ISCED is not restricted to facilitating statistical reporting and cross-national research, but includes monitoring of international development goals involving education targets and the provision of background information for national education policy formulation and decision-making (UNESCO, 1999: 5). The ISCED is thus a multidimensional multi-purpose cross-classification for harmonising national educational programmes into a cross-national framework for levels and fields of education (fields of education will not be discussed in this book, but see UNESCO (2006 [1997]: 41ff)).

The first version of the ISCED, ISCED-76, was developed by the UNESCO in the early 1970s and adopted in 1976. The use of this classification over the following 20 years by national authorities and international organisations revealed its inadequacies: the ISCED-76 was considered limited in scope, too crude to embrace recent changes in educational systems, not clearly specified and thus difficult to apply. This resulted in lacking comparability of education statistics (UNESCO, 1999: 4; OECD, 1999: 8f).

The ISCED-97 is made up of a set of concepts and definitions, which are assumed to be universally applicable, as well as operational instructions.<sup>5</sup> In the framework of

---

<sup>5</sup> The documentation of the ISCED-97 can be found in a number of publications by the UNESCO and the OECD: UNESCO (2006 [1997]) contains the formal framework and introduces the basic definitions and concepts of the ISCED-97. UNESCO (1999) is supposed to support countries in the application of the ISCED to their national data in a more operational way. The OECD (1999) manual is the most comprehensive documentation on the ISCED-97, and in a few instances deviates from the UNESCO’s conceptualisation of the ISCED-97. Such deviations will be highlighted in the following sections. The OECD (1999) manual includes detailed tables proposing how the national educational programmes and qualifications of all 29 OECD member states could be allocated to ISCED-97 categories, which were developed by the member countries in consultation with the OECD Secretariat. “These proposals represent the starting point for a process of consultation within the Technical Group, with the aim of working towards an internationally agreed upon allocation of national educational programmes to ISCED-97 in the OECD” (OECD, 1999: 10). Eurostat has comparable mapping tables (Eurostat, 2005) for use in

the ISCED-97, education is understood to comprise all communication (using different modes and media) designed to bring about learning, i.e. improvement in behaviour, knowledge, skills etc., in an organized and sustained setting involving a providing agency (UNESCO, 2006 [1997]: 9f.). According to this definition, incidental learning (i.e. as a by-product of some event or activity) is not covered (UNESCO, 2006 [1997]: 10). Otherwise, the ISCED framework is very general in scope, as it covers education thus defined “for all age groups and includes special needs education as well as other types of education irrespective of the institution or agency providing the education or the mode of delivery” (UNESCO, 1999: 5). Therefore, distance, adult and continuing education are included, too, and usually assigned to ISCED categories on the basis of their equivalence with regular education programmes (UNESCO, 2006 [1997]: 13).

The basic unit of classification of the ISCED is the educational programme, which is defined on the basis of its “educational content as an array or sequence of educational activities, which are organised to accomplish a pre-determined objective or specified set of educational tasks. Objectives can, for example, be preparation for more advanced study, qualification for an occupation or range of occupations, or simply an increase of knowledge and understanding” (UNESCO, 2006 [1997]: 11). ‘Educational activities’ are not restricted to courses, but may include practical periods of work in companies, team-based research projects and the individual writing of dissertations. In most cases, the completion of an educational programme and thus accomplishment of the pre-determined objective is formally certified through an award, diploma or the like.

## 2.1 The main levels of education in the ISCED-97

The ISCED levels of education are meant to relate to “gradations of learning experiences and the competences which the contents of an educational programme require of participants if they are to have a reasonable expectation of acquiring the knowledge, skills and capabilities that the programme is designed to impart” (UNESCO, 2006 [1997]: 15). The ISCED-97 classifies educational programmes into seven broad ordinal levels (0 to 6), which thus mean to reflect the degree of complexity of the content of an educational programme in broad steps from very elementary to more complex learning experiences. The definitions of some levels of education were changed and the rules for assigning educational programmes to

---

the UNESCO-UIS/OECD/Eurostat (UOE) data collection, which are updated regularly and also include EU-member states that are not covered by the OECD tables (e.g. Bulgaria and Estonia). The proposed mappings will be evaluated in the single chapters of this book from the point of view of the measurement of educational attainment in social research. Finally the UNESCO-UIS, OECD and Eurostat provide a further manual for the UOE data collection (UNESCO-UIS, OECD and Eurostat, 2004) that partly duplicates the OECD manual.

specific levels were clarified and tightened in the ISCED-97 compared to the ISCED-76.

ISCED level 0 (pre-primary education) is defined as programmes forming the “initial stage of organized instruction ... designed primarily to introduce very young children to a school-type environment, i.e. to provide a bridge between the home and a school-based atmosphere” (UNESCO, 2006 [1997]: 20). Pre-primary education is school or centre-based, starts at age three or later and lasts up to the age of entry into primary education. In contrast to child-care, which is not covered in ISCED level 0, staff in pre-primary education need a pedagogical rather than paramedical qualification. For the measurement of educational attainment, ISCED 0 would be used to classify individuals who did not receive any substantial amount of formal schooling, i.e. less than primary education.

ISCED level 1 (primary education or first stage of basic education) programmes “are normally designed on a unit or project basis to give students a sound basic education in reading, writing and mathematics along with an elementary understanding of other subjects such as history, geography, natural science, social science, art and music” (UNESCO, 2006 [1997]: 22). The transition from ISCED level 0 to 1 is marked by the beginning of systematic (and usually compulsory) studies, and the minimum and maximum entry age is five and seven years respectively. Primary education lasts up to entry into lower secondary education, typically after six years. In countries where primary and lower secondary education are integrated in one long educational programme (‘basic education’), only the first 6 years count towards ISCED level 1. In terms of educational attainment, individuals who completed primary education, but did not receive an ISCED 2 qualification, are assigned to ISCED 1.

ISCED level 2 (lower secondary education or the second stage of basic education) is marked by the full implementation of basic skills, the beginning of subject presentation and more specialised teaching than level 1. “In many, if not most countries, the educational aim is to lay the foundation for lifelong learning and human development on which countries may expand, systematically, further educational opportunities” (UNESCO, 2006 [1997]: 24). It starts after the end of primary education or the first six years of basic education and ends around nine years after the beginning of primary education, i.e. at age 14–16, which often coincides with the end of compulsory education.

ISCED level 3 (upper secondary education) constitutes the first level of post-compulsory and the final stage of secondary education in most OECD countries. Usually the completion of ISCED level 2 is required for entry into ISCED 3. The degree of specialisation is increased compared to level 2, and teachers typically need higher or more specialised qualifications. The age of entry is typically age 15 or 16 (but sometimes 14), and the duration can range from two to five years. The typical exit age is 18 or 19.

ISCED level 4 (post-secondary non-tertiary education) “captures programmes that straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper secondary or post-secondary programmes in a national context” (UNESCO, 2006 [1997]: 31). These programmes require the completion of ISCED level 3, but are often not considered significantly more advanced than level 3 (e.g. second cycle or second chance programmes, often for ‘correcting’ the choice of programme at level 3, or continuing/adult education). Their duration is between six months and two years. This level did not exist in ISCED-76, and such programmes were either assigned to ISCED level 3 or 5.

ISCED level 5 (first stage of tertiary education) “consists of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4” (UNESCO, 2006 [1997]: 34). Such programmes are provided by various types of colleges and universities and have special entry requirements (specific certificates from ISCED levels 3 and 4). The cumulative duration from the beginning of level 5 is at least two years, but completing two consecutive programmes of a cumulative duration of four to six years at level 5 is more common. These programmes do not yet lead directly to an advanced research qualification.

ISCED level 6 (second stage of tertiary education) “is reserved for tertiary programmes which lead to the award of an advanced research qualification. The programmes are therefore devoted to advanced study and original research and are not based on course-work only” (UNESCO, 2006 [1997]: 39). These are thus exclusively higher education programmes that require the submission of a thesis of publishable quality, and conclude with the doctorate or PhD, or the Licentiate in a few countries. They prepare for research and faculty posts.

Since it is practically impossible to directly assess and compare the complexity of the content of all educational programmes for all countries, the ISCED-97 uses a number of auxiliary criteria as proxies. These auxiliary criteria are ranked into main and subsidiary criteria, which complement each other (UNESCO, 2006 [1997]: 16; OECD, 1999: 13). These criteria include e.g. the typical starting age of participants, theoretical and typical duration of a programme, typical and minimum entrance requirement, type of certificate or diploma awarded upon successful completion of the programme and others. No auxiliary criterion should be the sole guide for attributing an educational programme to a certain level, but variations could be envisaged, keeping the content of the educational programme as the primary classification criterion in mind. Table 1 gives an overview of main and subsidiary criteria for assigning ISCED levels.

**Table 1. The ISCED-97 levels of education and the respective classification criteria**

ISCED-97 main levels of education	Proxy criteria for contents	
	Main criteria	Auxiliary criteria
0 PRE-PRIMARY Initial stage of organised instruction, designed primarily to introduce very young children to a school-type environment	<ul style="list-style-type: none"> <li>– Educational properties</li> <li>– School or centre-based</li> <li>– Minimum age</li> <li>– Upper age limit</li> </ul>	<ul style="list-style-type: none"> <li>– Staff qualification</li> </ul>
1 PRIMARY Normally designed to give students a sound basic education in reading, writing and mathematics	<ul style="list-style-type: none"> <li>– Beginning of systematic apprenticeship of reading, writing and mathematics</li> </ul>	<ul style="list-style-type: none"> <li>– Entry into the nationally designated primary institutions or programmes</li> <li>– Start of compulsory education</li> </ul>
2 LOWER SECONDARY Generally continues the basic programmes of the primary level, although teaching is typically more subject-focused, often employing more specialised teachers	<ul style="list-style-type: none"> <li>– Subject presentation</li> <li>– Full implementation of basic skills and foundation for lifelong learning</li> </ul>	<ul style="list-style-type: none"> <li>– Entry after some 6 years of primary education</li> <li>– End after about 9 years since the beginning of primary education</li> <li>– End of compulsory education</li> </ul>
3 UPPER SECONDARY Final stage of secondary education in most OECD countries where instruction is often more organised along subject matter lines than at ISCED Level 2, and teachers typically need to have a higher level, or more subject-specific, qualification	<ul style="list-style-type: none"> <li>– Entrance requirement usually completion of ISCED 2, or a combination of basic education and life experience that demonstrates the ability to handle ISCED 3 subject matter.</li> </ul>	
4 POST-SECONDARY NON-TERTIARY Straddles the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper secondary or post-secondary programmes in a national context.	<ul style="list-style-type: none"> <li>– Entrance requirement: ISCED 3</li> <li>– Content: not necessarily more advanced than ISCED 3</li> <li>– Participants older than at ISCED 3</li> <li>– Duration between 6 month and 2 years</li> </ul>	

**Table 1. The ISCED-97 levels of education and the respective classification criteria (continued)**

ISCED-97 main levels of education	Proxy criteria for contents	
	Main criteria	Auxiliary criteria
5 FIRST STAGE OF TERTIARY ISCED 5 programmes have an educational content more advanced than those offered at Levels 3 and 4.	<ul style="list-style-type: none"> <li>– Minimum entrance requirement (3A, 3B, 4A or 4B);</li> <li>– Type of certification obtained;</li> <li>– Duration</li> </ul>	
6 SECOND STAGE OF TERTIARY This level is reserved for tertiary programmes that lead to the award of an advanced research qualification. Programmes are devoted to advanced study and original research.	<ul style="list-style-type: none"> <li>– Research-oriented content;</li> <li>– Submission of thesis or dissertation</li> </ul>	<ul style="list-style-type: none"> <li>– Prepare graduates for faculty and research posts</li> </ul>

Source: UNESCO (2006 [1997]: Table 1) and OECD (1999: 22f.).

## 2.2 Complementary dimensions of the ISCED-97

The ISCED-76 did not provide any sub-categories within the different ISCED levels. The introduction of a set of complementary dimensions according to which some of the ISCED levels can be subdivided is the most consequential change introduced by the ISCED-97. These sub-dimensions serve to facilitate classification and achieve more pertinent statistics.

There are four such complementary dimensions, namely

1. Type of programme/type of subsequent education or destination
2. Programme orientation
3. Cumulative (theoretical) duration since the beginning of a specific ISCED and
4. Position in the national degree and qualification structure.

ISCED levels 0, 1 and 6 do not have any complementary dimensions.

### 2.2.1 Type of programme and type of subsequent education or destination

The type of programme or programme destination is denoted by capital letters A, B and C and occurs at ISCED levels 2, 3, 4 and 5. These letters have a somewhat different meaning at each level: type of subsequent education or destination at levels 2 to 4, and type of programme at level 5. Since the sub-categories at levels 3 and 4 are defined by their relationship to the sub-categories at ISCED level 5 and the sub-

categories at level 2 with reference to the sub-categories at level 3, the sub-categories will be described from ‘top’ to ‘bottom’.

ISCED 5A programmes are higher education programmes that are largely theoretically based. These are generally university studies, but equivalent studies at poly-technic colleges or universities of applied science that lead to an academic degree are also included. ISCED 5B programmes in contrast cover tertiary *vocational* education programmes of at least 2 years duration that prepare for direct entry into the labour market. They are thus rather practical in scope and more occupationally specific than type A programmes. These are generally sub-degree level courses, which are often based on previous vocational training or technical upper secondary education. It can be very difficult to draw the line between type A and type B programmes at level 5. The minimum criteria for classifying a programme as 5A are a minimum duration of studies of 3 years, ISCED level 6 as the typical qualification for faculty involved in teaching, and 5A studies either lead to access to studies for an advanced research qualification (ISCED 6) or to professions with high skills requirements.

At ISCED level 4, the OECD manual diverges from the UNESCO’s conceptualisation. According to the UNESCO, ISCED 4A programmes prepare for entry to ISCED level 5, irrespective of type of programme. Programmes classified as ISCED 4B in turn do not give access to tertiary education, but are designed for direct labour market entry. In contrast, the OECD proposes to use category 4A only for programmes preparing for ISCED 5A, and 4B for programmes preparing for ISCED 5B. Programmes classified as 4B in the UNESCO version are classified as 4C in the OECD version.

At ISCED level 3, 3A are “programmes … designed to provide direct access to ISCED 5A”, 3B “programmes … designed to provide direct access to ISCED 5B” and 3C “programmes … not designed to lead directly to ISCED 5A or 5B. Therefore, these programmes lead directly to labour market, ISCED 4 programmes or other ISCED 3 programmes” (UNESCO, 2006 [1997]: 31).<sup>6</sup>

For ISCED level 2, 2A programmes are “programmes designed for direct access to level 3 in a sequence which would ultimately lead to tertiary education, i.e. entrance to ISCED 3A or 3B”; 2B “programmes designed for direct access to level 3C” and 2C “programmes primarily designed for direct access to the labour market at the end of this level” (UNESCO, 2006 [1997]: 25).

Programmes denoted as C can thus be said to generally contain ‘terminal programmes’ that mainly prepare for labour market entry. Programmes in sub-category B give access to at least one higher level of education, but exclude access to the most theoretical programmes 3A and 5A (except 4A, which is largely used for

---

<sup>6</sup> The OECD version of ISCED level 4 is thus more consistent with the use of the sub-dimension ‘programme destination’ at ISCED level 3.

second-chance programmes for gaining access to university and can thus be accessed from ISCED 3B and 3C). Programmes in sub-category A (apart from 4A) contain the most direct path up to the highest level of education, i.e. the doctorate, and thus include traditional academic/general education (but not exclusively so).

### **2.2.2 Programme orientation**

The second complementary dimension is programme orientation, which is used at ISCED levels 2, 3 and 4. *General education* (abbreviated to 'gen', e.g. 3A (gen)) "is mainly designed to lead participants to a deeper understanding of a subject or group of subjects, especially, but not necessarily, with a view to preparing participants for further (additional) education at the same or a higher level" (UNESCO, 2006 [1997]: 25). General education is school based and leads sometimes, but not always, to a labour market relevant qualification.

*Pre-vocational or pre-technical education* (abbreviated to 'prev') "is mainly designed to introduce participants to the world of work and to prepare them for entry into vocational or technical education programmes" (UNESCO, 2006 [1997]: 26), but does not yet lead to a labour market relevant qualification. The proportion of vocational and technical contents should be at least 25% for classification as pre-vocational/pre-technical. This type of education is rather rare.

*Vocational or technical education* (abbreviated to 'voc') "is mainly designed to lead participants to acquire the practical skills, know-how and understanding necessary for employment in a particular occupation or trade or class of occupations or trades" (UNESCO, 2006 [1997]: 26). Such qualifications are directly relevant for the labour market and usually recognised by a country's employers' associations. The importance of vocational programmes as well as the specific organisation of vocational training and their vocational specificity varies a lot across countries.

'Programme destination' and 'programme orientation' tend to overlap (i.e. 'A' is mostly general education, 'B' pre-vocational and vocational, and 'C' mostly vocational). However the degree of overlap differs across countries: In countries with an 'open' educational system (e.g. Finland, Sweden, the UK and Central and Eastern European countries), where vocational education may also lead to subsequent general/academic education, vocational education is included in subcategory 'A' in terms of 'programme destination'.

### **2.2.3 Cumulative duration**

The cumulative theoretical duration (in full-time equivalents) since the beginning of ISCED level 3 or 5 is used to make additional differentiations within ISCED 3C, ISCED level 4 and ISCED 5A programmes.

Within ISCED 3C, the UNESCO distinguishes between programmes with less than six months duration, six months to one year, one to two years, and more than two years. In order to identify what counts as ISCED level 3 *completion*, the OECD distinguishes 3C programmes that have a duration comparable to the cumulative duration of 3A and 3B programmes in the respective country from programmes that are significantly shorter (i.e. by more than one year) (OECD, 1999: 42).

At ISCED level 4, the OECD uses cumulative duration since the beginning of ISCED level 3 to decide if an educational programme should be classified as ISCED 4 when ISCED 3C is the minimum entry requirement: If the cumulative duration of the 3C programme and the programme in question is more than the duration of the typical 3A or 3B programmes in the respective country, it should be assigned to ISCED level 4; otherwise it should be put into ISCED level 3.

At ISCED level 5, cumulative duration is a very important additional criterion to distinguish between 'lower' and 'higher' degrees. Lower degrees are generally shorter, and higher degrees often require the completion of a lower degree. The cumulative duration is calculated by adding up the duration of the successive programmes. The sub-categories distinguished by the UNESCO are

- 'Two and less than three years' (not used for ISCED 5A),
- 'Three and less than four years',
- 'Four and less than five years',
- 'Five and less than six years' and
- 'More than six years' (not used for ISCED 5B).

The OECD uses somewhat less detailed sub-categories: 'short' (two to less than three years); 'medium' (three to less than five years); 'long' (five to six years); and 'very long' (more than six years).

According to the differences between the UNESCO's and OECD's use of the sub-dimension 'cumulative duration', in the OECD mappings (OECD, 1999) the cumulative duration is only explicitly indicated for ISCED level 5. For ISCED 3C, it needs to be derived from the information on theoretical programme duration. This sub-dimension is thus hardly used at the other ISCED levels, although the EU-LFS data distinguish two sub-categories within 3C (programmes of less than and at least three years duration).

#### 2.2.4 Position in the national degree structure

Tertiary education is marked by an internal structure of qualifications in many countries, and the Bologna process implements such a structure in all European Union member countries since the Bologna declaration in 1999 (i.e. *after* the adoption of the ISCED-97, which means that the Bologna reforms are not explicitly reflected in the ISCED framework). In countries with an undergraduate/postgraduate

split, the first degree is an important transition point, and only a second ISCED 5A degree gives access to ISCED level 6.

This is picked up by the sub-dimension ‘position in the national degree structure’ in the ISCED-97. The internal structure thus refers to the division between undergraduate and postgraduate studies, concluding with a first and second degree respectively (or even further degrees). ‘ISCED 5A second’ programmes require the completion of an ‘ISCED 5A first’ programme, and should have a significantly higher level of content than first-degree programmes. A differentiation between first and second qualifications is also drawn within ISCED 5B. Most countries however do not have second qualifications at ISCED level 5B.

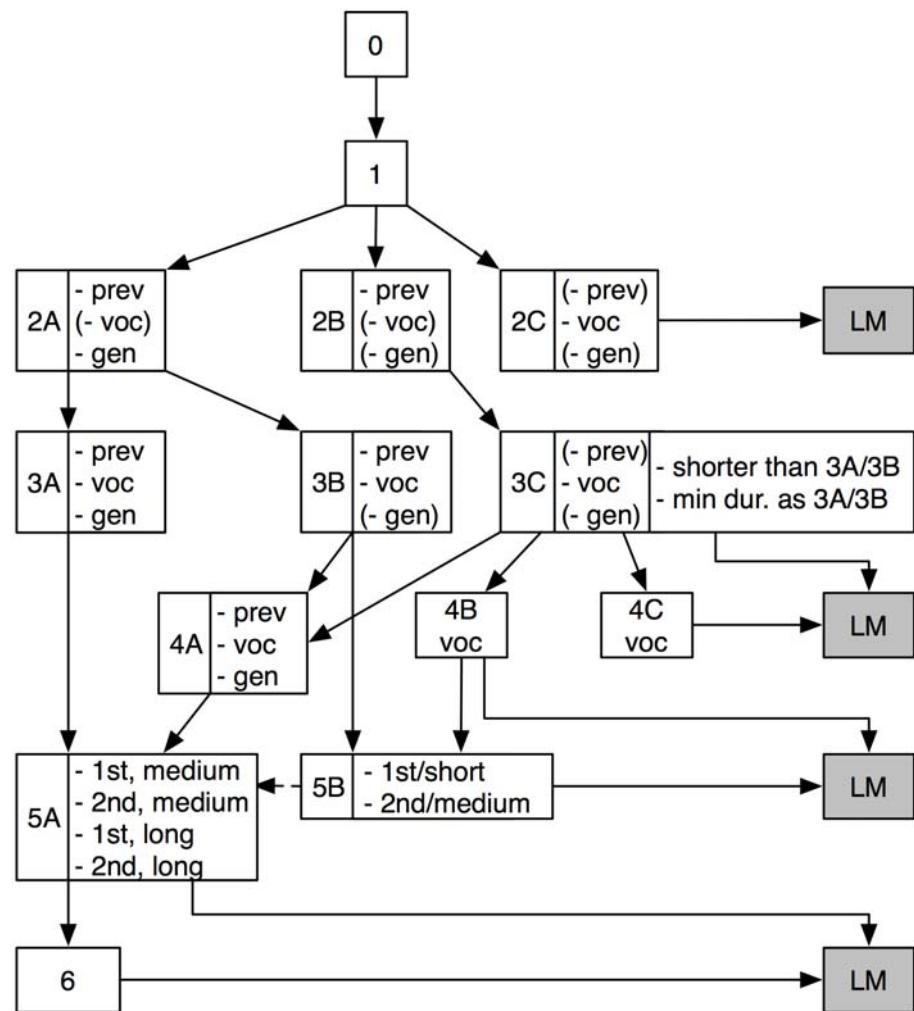
Many European countries did not have such a structure before the Bologna process kicked in, and their first degrees would have been equivalent to second degrees in countries that used to have this distinction already before Bologna. For example, British Bachelor’s degrees, the French *Licence* and the German *Diplom* and *Magister* are all first degrees, but German degrees take longer and accordingly cover a higher level of educational content than the others. Therefore, cumulative duration must be taken into account in order to trace actually similar qualifications. The most pertinent sub-categories within ISCED 5A are ‘first and medium’ (1<sup>st</sup>/med), ‘first and long’ (1<sup>st</sup>/long) and ‘second and long’ (2<sup>nd</sup>/long) degrees, but there are also ‘2<sup>nd</sup> and medium’ degrees (2<sup>nd</sup>/med) in a number of countries (e.g. *Maîtrise* in France, *Magisterexamen* in Sweden).

The OECD adds ‘intermediate’ qualifications to the qualification structure in ISCED 5A. This category does not count as *completion* of ISCED 5A, but covers the initial years of a longer 5A programme that conclude with a separate own examination (e.g. *Diplôme d’études universitaires générales*, DEUG, after the first two years of *Licence* in France; or *Zwischenprüfung* or *Vordiplom*, after the first two years of *Magister* or *Diplom* in Germany). From a human capital perspective, it is important to include the attainment of such a level of education separately from the previous (usually 3A) and later (5A first) qualifications (OECD, 1999: 54). For other purposes than the measurement of educational attainment, the later merging of ‘5A intermediate’ with whichever category is most suitable would still be possible. For the presentation of ISCED 5A graduates, intermediate qualifications should be excluded.

Figure 1 shows the transition pattern and typical educational paths taken through educational systems in terms of the ISCED-97. It builds on the transition pattern given by UNESCO (2006 [1997]: 18), but is slightly adapted to the OECD’s version of the ISCED, including the additional subcategory 4C, and also visualises the most important sub-categories. It should be noted that the arrows shown are simplified and only reflect ‘minimal entry requirements’. This means that although no arrow is drawn between e.g. ISCED 3A and ISCED 5B, this path is possible in most coun-

tries, as 3A is regarded as a more general qualification than 3B, and usually qualifications are ‘downward compatible’.

**Figure 1. The ISCED-97 transition pattern according to the OECD, including sub-categories**



Note: LM = Labour Market.

As the previous sections and Figure 1 reveal, the ISCED-97 is a very complex classification. Its application to actual data from different countries is by no means straightforward, and cannot be. In order to facilitate the application, the UNESCO has prepared an operational manual (UNESCO, 1999), which “will give specific and

operational instructions. Without them, no individual country, no matter how strong its intention to facilitate international comparisons, is in a position to determine whether its method of assigning programmes to international categories is compatible with the methods of other countries" (UNESCO, 1999: 11). It is therefore necessary that everybody who is responsible for the coding of national education variables into the ISCED-97 is familiar with this operational manual and the manual provided by the OECD (including the mapping tables for the single countries).

### **3 Evaluation of the ISCED-97**

In this section, the results of the evaluation of the ISCED-97 in the single chapters of this book are summarised. In the first parts of this section, a number of problems emerging during the application of the ISCED-97 in the single countries are described. The core issues in the application of the ISCED-97 can be divided into three areas: 1) conceptual limitations of the ISCED-97 itself (which sometimes lead to a loss of important distinctions in the harmonisation process), 2) difficulties in the application of the ISCED to actual educational qualifications in specific countries (e.g. when the national measurement instruments do not allow a strict implementation of the ISCED-97), and 3) constricted implementation in cross-national surveys.<sup>7</sup> At the end of this section, it will be checked if the distributions of educational attainment as measured by the ISCED in the EU-LFS and reconstructed from high-quality national data sources correspond.

#### **3.1 Conceptual limitations of the ISCED-97**

##### **3.1.1 Unclear definition of 'programme destination'**

The ISCED documentation differs with respect to the exact formulation of the definitions of the sub-dimension 'programme destination' (A, B and C). Sometimes even the same sub-category is defined in slightly differing ways, e.g. ISCED 3B is 'designed to provide access to 5B' (UNESCO 1999: 23) or 'designed to provide *direct* access to 5B' (UNESCO, 1997: 29 and OECD, 1999: 40, *italics added*). ISCED 2A is 'designed to *prepare students* for direct access to... ISCED 3A or 3B' (OECD, 1999: 34; UNESCO, 1999: 18, *italics added*) or 'designed for direct access to ISCED 3A or

---

<sup>7</sup> Apart from this, according to the national experts, a number of single mappings of national education categories to the ISCED-97 are disputable. The authors argue that re-thinking the way national qualifications are assigned to ISCED categories might improve the comparability and explanatory power of the resulting statistics. These usually very specific concerns about the assignment of single national categories are discussed in the single chapters.

3B' (UNESCO, 1997: 25). In both cases, the meaning is not the same. In the case of 3B, including non-direct access in the definition can make quite a difference in some countries (see e.g. the chapter on Germany). With respect to 2A, the former definition refers rather to the actual preparation in terms of educational content and skills, whereas the latter could be understood to more closely reflect the formal or legal rights of access. The formulation focussing on 'providing access to' some destination also makes the ISCED assignment of national educational qualifications more easily politically manipulated by changing formal rights of access of specific educational programmes through educational reforms that might otherwise consist in the mere re-labelling of educational programmes.

Finally, defining ISCED categories in terms of their entry requirements *and* in terms of which subsequent sub-category they give access to is problematic, because the definition of the related categories becomes recursive. There is no point in stating that ISCED 5B requires the completion of ISCED 3B, when ISCED 3B in turn is defined as being designed to prepare for ISCED 5B (see e.g. the doubts this raises in Germany and Spain). If there is no clear reason for assigning the higher programme to ISCED 5B, 3B qualifications could be classified as ISCED 3C and 5B qualifications as ISCED 4C just as well.

### **3.1.2 De-facto dominance of 'programme destination' over 'programme orientation'**

At the upper secondary level of education (ISCED 3), the country experts are generally dissatisfied with the fact that the dividing line between general and vocational education de-facto is of secondary importance only compared to 'programme destination'. This is underlined by the fact that 'programme orientation' is not implemented in data collection processes (see e.g. the EU-LFS, the ESS and the PISA studies, see section 3.3). As there is no perfect overlap between the dimensions 'programme destination' and 'programme orientation', the distinction between different tracks at the upper secondary level is blurred in the ISCED-97 in many countries.<sup>8</sup>

For example, in some countries, only upper secondary general (university preparatory) education is classified as ISCED 3A, whereas in others, category 3A includes a mix of vocational and general programmes. In the latter countries, the educational system is designed in such a way that choice of a vocational programme earlier in life does *not* (at least formally) restrict choice of university studies later in life. It could be argued that vocational upper secondary programmes currently coded as '3A (voc)' are, in terms of their educational content, not 'designed to prepare for' academic higher education (ISCED 5A), but rather for advanced vocational tertiary

---

<sup>8</sup> The same would actually apply to ISCED 2 if countries with substantial amounts of vocational education at the lower secondary level were covered in this book.

programmes (ISCED 5B) and maybe lower tier (polytechnic) programmes within ISCED 5A. Graduates from vocational upper secondary programmes indeed usually have much lower chances of success when applying to traditional universities or taking entrance examinations than general education graduates.

Also in terms of functional equivalence in the labour market, 'ISCED 3A (voc)' programmes are probably comparable to ISCED 3B or even 3C programmes (rather than '3A (gen)' programmes) in the former group of countries: These *three* categories are where to find initial vocational education in the ISCED-97. For many labour market related research questions it would thus certainly be desirable to reduce them to two categories in order to allow for different levels of vocational education, as, from a theoretical point of view, 'programme orientation' is at least as important as 'programme destination'. However, if the subcategories 'vocational' and 'general' within 3A are not used, this cannot be achieved, and ISCED 3A is hardly comparable over countries. Therefore, when applying the ISCED-97, it is important to distinguish between the different types of upper secondary programmes, more specifically '3A (gen)' and '3A (voc)' in the data. A more far-reaching revision of the use of sub-dimensions in the ISCED is proposed in the final chapter.

### **3.1.3 Lack of differentiation within ISCED-97 categories**

Although the ISCED-97 is much more detailed than the ISCED-76, there still seems to be a lack of differentiation at certain levels when looking at data coded using the ISCED. Sometimes available criteria of differentiation do not work very well (e.g. at ISCED level 2); or there are no criteria to distinguish between some qualifications (e.g. within '3A (gen)' and 5A). Sometimes the problem is rather due to the fact that sub-dimensions provided by the ISCED framework are not implemented in the data collection or coding process (particularly problematic at ISCED levels 3 and 5) than to the ISCED framework itself (this latter point is covered in section 3.3).

For many European countries, the ISCED sub-dimensions do not provide a useful differentiation of highest educational attainment at ISCED level 2. The OECD mappings reveal that hardly any European country makes use of the sub-categories 2B and 2C, although some countries retain some form of tracking at the lower secondary level of education (e.g. Germany and the Netherlands). In Germany for example, *Hauptschulabschluss* is classified as ISCED 2A (together with *Realschulabschluss*), because it prepares for vocational training, which is classified as ISCED 3B rather than 3C, and, according to the ISCED-97, programmes preparing for 3A and 3B are classified as 2A. There are hardly any programmes at the lower secondary level in Europe nowadays that only give access to 3C or the labour market. In the Netherlands, pre-vocational lower secondary education (VMBO) is classified as

ISCED 2B, as it prepares for MBO programmes, which are classified as ISCED 3C.<sup>9</sup> In the Czech Republic, there is a distinction between selective schools vs. mainstream schools at the lower secondary level, which is also not picked up by the ISCED, as in theory attendance at all types of lower secondary schools prepares for access to ISCED 3A. However, just by their more homogenous population of pupils, selective schools are usually able to provide a better level of instruction, and they are more prestigious than mainstream schools.

Therefore, in countries with 2A qualifications only, all differentiation between lower secondary graduates, which occurs through tracking between schools, streaming within schools and final marks, is hidden from the ISCED. The same applies to ISCED 3A (even if ‘programme orientation’ is reported): access to higher education is often highly conditional on final marks, and heterogeneity with respect to final marks (and actual skills) within 3A can be expected to be highest in countries with many ISCED 3A graduates.

At ISCED level 5A, some countries (e.g. Finland, Germany, Hungary, the Netherlands and the UK) have or used to have a two-tiered higher education system consisting of traditional universities on the one hand and qualitatively different, more vocationally oriented polytechnics, technical colleges or ‘universities of applied science’ or special university courses (*diplomi universitari e scuole dirette a fini speciali* in Italy) on the other. These programmes tend to differ both in duration of studies and in the educational content. The prestige of the different types of institutions and possibly also the labour market chances their qualifications convey vary substantially. Lower tier qualifications usually also do not give access to ISCED level 6 programmes. The ISCED-97 does not provide any sub-dimension to distinguish the different higher education sectors within ISCED 5A. As a result, the ISCED-97 hides valuable information for programmes at ISCED level 5A in a number of countries. The choice of categories within the sub-dimension ‘programme duration’ is also not very helpful in this respect: Most university programmes last between 3 and less than 5 years and are thus classified as ‘medium’. In Germany for example, *Fachhochschulabschluss* has a theoretical duration of four years and *Universitätsschluss* of 4.5 years, so that both would be classified as ‘medium’.<sup>10</sup>

In some of these countries, the lack of differentiation within ISCED 5A has consequences also for the heterogeneity of qualifications within ‘ISCED 3A (gen)’: In

<sup>9</sup> The direct comparison of Germany and the Netherlands also shows how misleading the classification according to ‘programme destination’ can be: Only because higher vocational education is organised differently in Germany and the Netherlands, initial vocational education and even lower secondary education, otherwise pretty comparable in both countries, are classified differently.

<sup>10</sup> The OECD mappings however give a theoretical duration of 5 years for university studies (thus closer to the actual duration), so that these are classified as ‘long’ and differentiated from studies at *Fachhochschule*.

Germany and the Netherlands, there are specific 3A qualifications (*Fachhochschulreife* in Germany and *HAVO-diploma* in the Netherlands) that only give access to lower tier 5A programmes (*Fachhochschulen* in Germany and *HBO* in the Netherlands), but not to traditional universities. For access to *all* 5A programmes, the traditional university preparatory certificate (*Abitur* in Germany and *VWO-diploma* in the Netherlands, both one year longer than the more restricted certificates) is required. This difference within '3A (gen)' is not picked up by the ISCED, as both types of higher education institutions are classified as ISCED 5A, and both types of upper secondary certificates are consequently classified as 'ISCED 3A (gen)'. The internal hierarchy of qualifications within '3A (gen)' is thus not reflected by the ISCED-97. If the different types of higher education institutions were differentiated in the ISCED, the different types of upper secondary certificates could be more easily differentiated, too.

Finally, the ISCED-97 does not allow any distinction between elitist, highly selective and prestigious types of higher education (e.g. *Grandes Écoles* in France or Russell Group universities in the UK) and mainstream (and often mass-) universities.

### **3.2 The application of the ISCED-97 to national educational qualifications**

#### **3.2.1 Educational reforms and comparability across time**

The first and one of the most frequently mentioned problems with applying the ISCED to national data is related to educational reforms, which result in changing entry ages and requirements, durations and examination standards for the affected educational programmes. The UNESCO and OECD documentation is tacit on how to deal with 'historical' qualifications generally, and the OECD mappings do not cover qualifications not being awarded in 1997, when the ISCED-97 was implemented. This means that for outdated qualifications, which particularly senior individuals in all countries hold, there are currently no 'official' proposals on how to code them into the ISCED-97.<sup>11</sup> This is a major problem for coding data including the general population, as those responsible for the coding will have to apply the ISCED criteria themselves, which might lead to inconsistent coding. Therefore, the authors of the single chapters of this book will expand the OECD mappings in order to include outdated qualifications that are not yet covered. Even so, some ISCED categories will be empty for certain age groups, as the respective educational programmes did not exist (yet/any more) in certain periods of time.

To make things worse, in the national data, outdated qualifications are often found in one response category with the current qualification they are (officially) consid-

---

<sup>11</sup> Qualifications introduced since 1997 are incorporated in the Eurostat mappings on a regular basis.

ered to be equivalent to (see e.g. the chapter on Spain). As a result, various cohorts of individuals are classified as holders of the ‘same’ educational qualification even though the cumulative duration, entrance requirement and/or content of studies might vary substantially. In the case of Spain, as the data do not differentiate between pre- and post-reform qualifications, the ISCED cannot be applied in a consistent way. The lack of separate categories for current and ‘old’ qualifications moreover leads to the fact that *empirical* equivalence e.g. in terms of labour market prospect or inequalities in access cannot be tested properly. The use of age as a proxy for education cohort would be a possible but still unsatisfactory workaround.

Another problem related to change over time is that standards of specific educational qualifications sometimes change.<sup>12</sup> Unless changing standards are accompanied by corresponding changes in the ISCED criteria (typical entry age, entry requirements etc.), there is no change in the classification of such qualifications over time, and the change remains hidden. This is due to the use of auxiliary criteria as proxies for educational content, which are necessarily imperfect. It is e.g. widely recognised by sociologists in the UK that standards for educational certificates typically awarded around age 16 and giving access to upper secondary general education have decreased over the last century whenever the respective examinations were reformed (i.e. the School Certificate was more demanding than GCE O-levels, replacing the former in 1951, and O-levels, abolished in 1988, were more difficult than the current GCSEs; see also the chapter on the UK in this volume). Although the ‘level of educational content’ in terms of the ISCED has changed, all these qualifications would be classified in the same ISCED category.

### 3.2.2 Problems due to national coding instruments

In most countries, a ‘perfect’ implementation of the ISCED-97 is impossible because of the characteristics of national instruments or coding procedures.

Firstly, in some countries (e.g. Poland and Sweden), final examinations or certificates are not taken into account in the ISCED-97, so that highest level of *attendance* is measured rather than highest level of education *completed*.

Secondly, the way data are collected nationally currently makes the distinction between ISCED levels 3 and 4 impossible in some countries. In Slovenia for example, ISCED level 3 and 4 cannot be separated at all, and in Finland, only ISCED 4C can be distinguished. If individuals complete two successive vocational training programmes in Germany, this should be classified as ISCED 4B, but in practice this cannot be differentiated from ISCED 3B. In Ireland, apprenticeships are classified as

---

<sup>12</sup> This is however difficult to prove empirically, and thus often remains a matter of political debate: Have standards really dropped, or are pupils nowadays better prepared to meet the examinations’ requirements because of improved educational provision over time?

ISCED 4C, although the formal entrance requirement is ISCED level 2. The reason is that “most” individuals enrolling in apprenticeships have actually completed ISCED level 3. The national data again do not distinguish between these different pathways to apprenticeships. The proper construction of ISCED level 4 in fact requires some basic information on educational careers, usually not available (see a proposal on how to improve this in the final chapter). Maybe ISCED level 4 would be less marginal if it was properly identified – we cannot really tell.

Thirdly, apart from ISCED level 4, some countries also encounter problems implementing the ISCED-97 at other levels. In Ireland, the distinction of sub-categories within ISCED level 3 cannot be made, which is a real problem for the cross-national comparability of the Irish data (even if category 3C is probably small). In Slovenia, due to the way data are collected nationally, Master’s and doctoral degrees cannot be distinguished, so that ISCED level 5A (long) and ISCED level 6 have to be aggregated whenever comparing Slovenian data with other countries, which in turn requires that in these other countries, ‘5A (med)’ and ‘5A (long)’ are differentiated. In Finland, the only current qualification at ISCED 5B (police academy qualification) cannot be distinguished from polytechnic degrees (ISCED 5A), but older 5B qualifications are identified.

Furthermore, the differentiation below ISCED level 2 is impossible or very difficult in a number of countries, partly because response categories for the national educational attainment variables do not differentiate between different levels of ‘less than compulsory education’ (e.g. Hungary, Germany), partly because the length of primary schooling has changed over time (e.g. Spain, Estonia). The implicit expectation that everybody completes compulsory education, which could explain the lacking differentiation between ISCED level 0 and 1 in the national data in some countries, might not hold for immigrants, who received their education abroad, or for older cohorts, for whom only primary education might have been compulsory.

Finally, it would be desirable to identify individuals who dropped out of compulsory education. Currently, different countries more or less arbitrarily use different and inconsistent solutions for coding ‘less than ISCED 2/no formal qualification’ in the EU-LFS (and also in the ESS): In some countries (Germany, Netherlands and Finland), there is a category ‘ISCED 0–1’, which looks like a good compromise, whereas in Sweden and Hungary, all cases with less than ISCED 2 are classified in ‘ISCED 1’ (and ISCED 0 is empty), and in the UK, in ISCED 0 (and ISCED 1 is empty). If the respective differentiation cannot be implemented, there should be at least one common solution for all countries.

### **3.2.3 Inconsistent application of the ISCED-97 in different countries**

Equivalent levels of educational attainment sometimes end up in different ISCED categories in different countries. This has basically two reasons: Firstly, the differ-

ent data collection practices in different countries that make some distinctions impossible (see the previous section), and secondly, a lack of specificity of the ISCED-97 for the classification of dropouts and uncertified education.

With respect to the former, in Germany for example, if individuals first complete general upper secondary education and then enrol in upper secondary vocational training, this is correctly classified as 'ISCED 4A (voc)'. In Finland, the very same case is however usually included in 'ISCED level 3A (voc)', as the national data do not allow the corresponding distinction. An example for the latter problem is that in the UK and France, individuals who complete compulsory education, but do not achieve any formal school certificate, are officially classified as ISCED 2A. In Germany and probably most other countries, such cases would be classified as ISCED level 1. Both are not conducive to the cross-national comparability of educational attainment data, and more examples of this can be found in the single chapters of this book.

ISCED level 4 is possibly the most difficult ISCED level to implement, as it is defined rather vaguely, and the respective qualifications are not very common or visible in many countries. As the UNESCO's documentation states that level 4 programmes are not necessarily more advanced than level 3 programmes, the main difference between the two levels is the order in the educational career. It is however also possible to successively complete two educational programmes at level 3, if the first is classified as 3C. The OECD specified to use ISCED level 4 whenever the cumulative duration of the two ISCED level 3 programmes is longer than a standard 3A programme (see section 2.2.2), but a closer look at the OECD mappings reveals that this was not followed in all countries (e.g. Estonia, France and Poland).

Some country experts even suggest merging ISCED level 4 qualifications with the respective ISCED level 3 qualifications or mention that this is common practice in their respective country (e.g. in the Czech Republic, Finland and Slovenia), as the certificates awarded are either the same or nationally regarded as equivalent to level 3 qualifications, and because reserving extra categories for uncommon qualifications is perceived to be inefficient. This is however not recommendable, firstly because some ISCED level 4 qualifications *are* more advanced than ISCED level 3, and secondly because the *cumulative* educational attainment is higher for individuals who complete two upper secondary programmes successively (which is one of the main uses of ISCED level 4). Again, some scepticism with respect to the application of national equivalence rules that might refer to a different concept of 'equivalence' than the ISCED is justified.

### **3.3 Implementation of the ISCED-97 in cross-national surveys**

Finally, a much bigger lack of differentiation than the one described in section 3.1.3 occurs in actual cross-national data sets, because not the 'full' ISCED-97 is imple-

mented, but rather a simplified version. No current cross-national survey implements the sub-dimensions ‘programme orientation’, ‘programme duration’ (apart from the EU-LFS at level 3C) and ‘position in the national degree structure’. In no survey is the sub-dimension ‘programme destination’ implemented at ISCED level 2, but in some this sub-dimension is used at levels 3 and 5. A number of country experts however think that ‘programme orientation’ is more important than ‘programme destination’, so that the way the ISCED-97 is implemented in these surveys seems to miss the point when practically prioritising the latter over the former. Obviously, this is not a problem of the classification as such, but the result of the unsatisfactory implementation of the ISCED-97. Let us have a closer look at how some surveys implement the ISCED-97.

In the ESS, a very simplified version of the ISCED-97 is used for coding respondents’, their partners’ and parents’ highest level of education. In this version of the ISCED, all complementary dimensions are ignored, so that the intended cross-national measure only reflects the seven main ISCED levels. As levels 0, 1, 4 and 6 are rather rare, most cases are found in ISCED levels 2, 3 and 5, which tend to be big. A three-category version, summarising ISCED levels 0 to 2, 3 and 4, and 5 and 6 actually does not look much different from this seven-category version of the ISCED. Such a level of aggregation certainly leads to a significant level of heterogeneity within ISCED levels 2, 3 and 5, and a subsequent loss of explanatory power. As an example, vocational tertiary education (ISCED 5B) is found in the same category as academic degrees (ISCED 5A) in the ESS, although it is in fact closer to qualifications classified as 4A (voc), 4B and 4C than to 5A. Finally, as the recoding was performed without centralised coordination, there are also many misclassifications.<sup>13</sup>

In the PISA studies, the ISCED-97 is used for measuring the educational attainment of students’ parents. The sub-dimension ‘programme destination’ is partly differentiated at levels 3 (3A vs. 3B/C) and 5 (5A vs. 5B, only since 2003), but ISCED level 6 is merged with ISCED 5A (and 5B in 2000). The PISA uses several questionnaire items to assess parental educational attainment: Firstly, highest level of *schooling* is assessed with an item covering ISCED levels 0 to 3. Then, three single items ask if a student’s mother or father has an ISCED 4, 5B, and/or 5A/6 qualification respectively (PISA 2003 and 2006; in 2000, there was only one item asking about 5B/5A/6). In this way, some basic information on the parents’ educational careers is collected, which is unique to the PISA studies. However it would be desirable to differentiate between ‘3A (gen)’ and ‘3A (voc)’ programmes and between 1<sup>st</sup>/medium university degrees (5A 1<sup>st</sup>/med) and higher degrees (5A 2<sup>nd</sup>/long and ISCED 6). Although the coding of education has changed over the years, there is backward compatibility, as the coding from 2003 and 2006 can be transformed into the coding from 2000.

---

<sup>13</sup> For a detailed evaluation of the measurement of education in the ESS, see Schneider (2007).

In the EU-LFS, the ISCED-97 was implemented for measuring the individuals' highest level of educational attainment. The codification of the ISCED was first introduced in 1998 and has changed in 2001 and 2003. From 1998 to 2001, ISCED levels 3 and 4 were not distinguished, but the sub-dimension 'programme destination' was fully implemented (3A/4A, 3B/4B, 3C/4C). Since 2001, ISCED levels 3 and 4 were distinguished. From 2001 to 2003, ISCED level 3 was differentiated into 3A, 3B and 3C, but since 2003, 3A and 3B are collapsed in one category (3A/B). With respect to ISCED level 4, between 2001 and 2003, 4A, 4B and 4C were not distinguished, but since 2003, 4A and 4B (4A/B) are differentiated from 4C. 'No formal education or less than ISCED 1' is only included as a separate category since 2003. Within ISCED 3C, there is a distinction between short (less than 3 years) and long (at least 3 years) programmes in all years, and only the latter is merged with ISCED 4C between 1998 and 2001. 5A and 5B are distinguished in all years, but there is no distinction within 5A between first and second or medium and long degrees.

Therefore, the ISCED variable in the EU-LFS is not consistent over years, and, unlike the PISA studies, there is no way of getting from one to the other coding. If the main levels and sub-categories A, B and C had been fully implemented in all years, such a problem would not have occurred. The level of aggregation of educational qualifications is not only a problem for comparisons over time, but also for the relevance of the resulting statistics. The difference between qualifications providing access to very different types of tertiary education (3A leading to 5A and 3B leading to 5B) is totally ignored since 2001, although such programmes are very different in terms of their functions for the labour market and in terms of their educational content.<sup>14</sup> It is unclear why sub-categories are merged in different ways for different years, as a rather high price is paid for the slight saving on numbers of categories.

In which cases could the neglect of sub-dimensions (other than programme destination) be consequential? The country experts most often mention this as a problem for the sub-dimensions 'programme orientation' within ISCED 3A and 'programme duration' and 'position in the national degree structure' within 5A in the EU-LFS.

The available differentiation between general and vocational programmes is neither implemented in the EU-LFS, nor in any other international survey using the ISCED-97 (e.g. the ESS or PISA). This is particularly problematic in countries with relatively open educational systems (e.g. the UK, Sweden and Finland, but also most Central and Eastern European countries), where 'programme orientation' does not determine 'programme destination'. Then, vocational and general qualifications end up in the same destination categories, namely A, making these catego-

---

<sup>14</sup> For Germany for example, this means that vocational training (3B) cannot be differentiated from university preparatory general education (3A).

ries more heterogeneous than in countries where all vocational programmes are classified as B or C.

At ISCED level 2, out of all countries covered in this book, only Bulgaria has an 'ISCED 2A (voc)' qualification. The transition from vocational lower secondary to general upper secondary could be rare. As there are no data for educational attainment reported, we cannot tell if this distinction is important or not.<sup>15</sup>

With respect to ISCED 3A, in a number of countries – particularly in Central and Eastern Europe (Bulgaria, the Czech Republic, Hungary, Poland and Estonia), but also in Finland and Italy – a distinction is made between secondary general and secondary vocational, technical or professional schools. These latter types of schools are assigned to 'ISCED 3A (voc)', or, more rarely, '3A (prev)'. In Sweden and Ireland, there are upper secondary general and vocational or pre-vocational tracks *within* schools. The highest type of upper secondary vocational education (MBO level 4) in the Netherlands is also classified as '3A (voc)'. In the UK and Finland, *all* vocational upper secondary qualifications are classified as '3A (voc)', even if they do not conclude with a maturity certificate, as educational policy in these countries tries to keep the transition to higher education generally open. In Finland for example, access to higher education is regulated via entrance examinations rather than upper secondary school certificates.

Although there are no legal restrictions for leavers of 'ISCED 3A (voc)' programmes, general and vocational programmes at ISCED level 3A are usually strongly differentiated according to student ability, social background, as well as outcomes. It seems that graduates of upper secondary vocational and technical programmes are disadvantaged in the transition to tertiary education, as they do not acquire skills comparable to those of graduates from secondary general schools or tracks. Thus, not only the distinction between destinations (A, B or C), but also between vocational and general programmes within ISCED 3A is important. If the distinction between general and vocational programmes within 3A is not made, the actual amount of internal differentiation remains hidden and possible differences between these qualifications cannot even be tested empirically. It is therefore sometimes hard to tell if individuals with vocational upper secondary qualification have many chances of being accepted or passing entrance examinations at universities.

At ISCED level 4, all sub-categories are usually very small. However a distinction between vocational and general education within 4A still makes sense: Such a differentiation would distinguish between individuals who first followed a general upper secondary track (3A (gen)) and then enrolled in vocational training (4A (voc)) on the one hand, and individuals who first completed vocational training (3C or 3B) and then acquired a university entrance qualification (4A (gen)) on the other. ISCED

---

<sup>15</sup> In the ESS, the Bulgarian education variable does not distinguish between vocational and general education, so this does not help, either.

level 4 is therefore quite useful for at least minimally reflecting individuals' paths through the educational system. As mentioned above, it is currently difficult to implement this in many countries though, due to the way data is coded nationally, and such a distinction is not made in any current cross-national survey.

Now let us turn to ISCED 5A. Possibly the most crucial shortcoming of the implementation of the ISCED-97 in current cross-national surveys, mentioned by many country experts, pertains to the classification of higher education. Traditional university degrees might have been more easily identified with the ISCED-76 than with the ISCED-97, since the former used separate levels to differentiate lower and higher university degrees. ISCED-97, in contrast, uses just one level (5) and one subcategory (A) for both lower and higher university degrees (where lower and higher can mean first and second degrees as well as degrees from different institutions, e.g. polytechnics and traditional universities). The existing complementary dimensions, duration of the programme and position in the national degree structure, have not been implemented in any large-scale social survey so far, including the EU-LFS. As a result, the ISCED-97 does not differentiate visibly enough between polytechnic and traditional university degrees on the one hand and B.A. and M.A. degrees, which is particularly important in light of the Bologna process, on the other hand.

### **3.4 Consistency between the EU-LFS and national data sources**

This last section reports the results of the comparison between the distributions of the ISCED-97 in the EU-LFS and its reconstruction from national data sources according to OECD mappings, which was coded by the National Statistical Institutes. The distributions are presented in Table 2. For each country, the leftmost column shows the distribution of the ISCED-97 in the EU-LFS. The right column shows the distribution achieved through the recoding of national education variables in a national labour force survey or census performed by the country experts according to the OECD mappings.<sup>16</sup> This comparison serves to evaluate the reliability of coding the ISCED-97 from national education variables and may point to problems therein.

Firstly the results for continental Western Europe will be reported, then for Southern Europe, Central and Eastern Europe, Scandinavia and finally Britain and Ireland.

In the Netherlands, as the categories published in the national LFS partly do not overlap with the ISCED, the EU-LFS sub-categories cannot be reproduced at ISCED levels 3, 4, 5 and 6, despite the fact that the EU-LFS is based on the national LFS. Overall, ISCED levels 3 and 4 are slightly larger (1.6%) in the EU-LFS than in the national data set. In Germany, ISCED 3A/B is 1.5% larger and ISCED 5A 1.2% smaller in

---

<sup>16</sup> In the country chapters, some authors additionally show distributions using their "ideal" mapping of national qualifications to the ISCED, not shown here.

**Table 2. Comparison of the distribution of the simplified ISCED-97 between the EU-LFS and national data sets (25–64 year-olds)**

ISCED-97, as in the EU-LFS	Netherlands (2004)		Germany (2004)		France (2004)		Spain (2004)		Italy (2004)	
	EU-LFS, Q4	EBB	EU-LFS, Micro- census Q2	EU-LFS census Q4	LFS	EU-LFS, Q1	LFS	EU-LFS, Q2	LFS	
ISCED 0					1.3	1.3	1.4	1.4	2.6	2.7
ISCED 0–1	7.2	8.1	2.1	2.1						
ISCED 1					12.3	13.8	26.1	27.3	16.1	16
ISCED 2	21.6	22.0	14.2	14.2	19.5	19.6	27.8	26.5	31.6	32.4
ISCED 3C (<3y)					—	27.1	0.5	0.4	0.7	—
ISCED 3C (≥3y)	16.3				27.6	2.2	0.0	6.1	7.5	7.6
ISCED 3A/3B	21.8		54.6	53.1	14.9	12.1	19.9	12.2	30.4	28.7
ISCED 3 or 4		40.4								
ISCED 4					0.1	0.1				
ISECD 4A/4B	0.0		6.0	5.6						
ISCED 4C	3.9						0.2	0.3	1.1	1.2
ISCED 5B	2.3		9.7	10.3	9.9	9.5	7.1	7.1	0.4	0.4
ISECD 5A	26.4	28.5	11.9	13.1	14.1	13.7	17.0	18.5	9.4	10.9
ISCED 6	0.5		1.4	1.6	0.5	0.6	0.3	0.4	0.1	0.1

Note: Distributions not adding up to 100% is due to rounding.

the EU-LFS than in the Microcensus. In France, the national data yield some cases with a qualification at ISCED level '3C (long)' in addition to the many cases classified as '3C (short)', while in the EU-LFS the former seem to be included in ISCED 3A/3B and the latter are classified as '3C (long)' (although the respective programmes usually take less than three years). Apart from that, there are only very minor differences between the two distributions; the largest one (of 1.5%) is at ISCED level 1, where the EU-LFS reports fewer cases than the national LFS.

In Spain, in the EU-LFS the ISCED-97 was obviously not coded according to the mappings of the OECD or Eurostat, as category '3C (long)' is tiny in the EU-LFS compared to the national LFS, and category 3A/B is much larger. ISCED level 3 altogether however is very similar, so it looks as if longer 3C qualifications were classified as 3B (and thus coded ISCED 3A/B) in the EU-LFS. In Italy, there are again only minor differences of the pattern we have already seen in Germany and the Netherlands, namely a larger category 3A/B (by 1.3%) and a smaller category 5A (1.5%) in the EU-LFS compared to the national LFS.

**Table 2. Comparison of the distribution of the simplified ISCED-97 between the EU-LFS and national data sets (25–64 year-olds) (continued)**

ISCED-97, as in the EU-LFS	Slovenia (2004)		Hungary (2004)		Czech Republic (2001)		Poland (2002/2003)		Estonia (2004)	
	EU-LFS, LFS Q4		EU-LFS LFS		EU-LFS Census		EU-LFS Census 2003, 2002 Q4		EU-LFS LFS	
ISCED 0	0.5	0.4	—	—	—	0.4	0.4	0.5	0.6	0.4
ISCED 1	2.3	2.7	2.6	2.1	0.3	0.2	0.2	—	1.1	0.9
ISCED 2	17.4	17.4	25.4	22.6	13.8	13.5	16.9	17.9	13.4	12.7
ISCED 3C (<3y)							33.8	34.3		
ISCED 3C (≥3y)	28.7			29.5	28.8	42.0	43.2		8.0 <sup>b</sup>	8.6
ISCED 3A/3B				28.2	28.1	34.3	27.3	32.9	30.1	43.5
ISCED 3B or 4B		27.7								
ISCED 3A or 4A		4.3								
ISCED 3 or 4		63.5								
ISCED 4						—	2.6			
ISCED 4C								3.3	4.4	
ISECD 4A/4B			1.6	1.7						7.6
ISCED 5B	7.8	9.2	0.2	0.2	0.6	1.1			10.3	11.7
ISECD 5A	7.5	8.6	12.2	16.3	8.8	11.2	12.5	12.4	15.3	15.7
ISCED 6	1.1 <sup>a</sup>	1.1 <sup>a</sup>	0.2	0.3	0.2	0.4		0.4	0.2	0.3
ISCED-97, as in the EU-LFS	Finland (2004/2005)		Sweden (2004)		UK (2004/2005)		Ireland (2004)			
	EU-LFS 2004	Register 2005	EU-LFS	LFS	EU-LFS 2005	LFS 2004/05	EU-LFS, Q2	QNHS, Q1		
ISCED 0			—	—	0.2	0.1	0.6	0.6		
ISCED 0–1	11.2									
ISCED 1		23.6	6.3	7.3	—	0.3	16.9	17.7		
ISCED 2	10.8		10.3	11.0	14.9	19.2	18.0	18.6		
ISCED 3			50.3		8.3		27.3	24.3		
ISCED 3C (<3y)				31.7	13.9	34.5	0.1	0.1		
ISCED 3C (≥3y)					18.6					
ISCED 3A/3B	46.9			17.3	14.8	14.9				
ISCED 3 or 4		42.2					0.1	0.1		
ISECD 4A/4B					0.1	0.1				
ISCED 4C	0.2		6.9	6.1					10.3	10.5
ISCED 5B	15.4	15.5	8.6	8.5	8.9	10.2	10.2	10.5		
ISECD 5A	14.9	17.7	16.6	17.2	19.4	19.8	16.3	17.4		
ISCED 6	0.7	0.9	0.9	0.9	0.9	0.9	0.4	0.4		

Notes: Distributions not adding up to 100% is due to rounding.

<sup>a</sup> ISCED 6 here also includes postgraduate specialisation and Master's degrees.

<sup>b</sup> In the first two quarters, most 3C qualifications were classified as shorter than 3 years. From the 3rd quarter onwards, all were classified as ≥3 years.

In Slovenia, a lower proportion of individuals at levels 5A (1.1%) and 5B (1.4%) is found in the EU-LFS as compared to the Slovenian LFS. In turn, ISCED level 3/4 is slightly higher (2.9%) in the EU-LFS. Moreover, in Slovenia, the EU-LFS does not differentiate between any type of education at the upper-secondary and post-secondary non-tertiary levels (ISCED levels 3 and 4), while this is possible with the national data. Results clearly show that ISCED levels 3A and 4A as the highest level of attainment are rather rare in Slovenia, whereas high proportions of students are channelled to ISCED 3B and 4B on the one hand and 3C and 4C on the other (about 28% each). In Hungary, there is a higher proportion of individuals at ISCED level 2 (2.8%) and a lower proportion of individuals at levels 5A (4.1%) reported in the EU-LFS compared to the Hungarian LFS. The reasons remain unclear, and the fact that the 'neighbouring' categories are of similar sizes and that the data in both columns are in the end derived from the Hungarian LFS makes this result quite puzzling. In the Czech Republic, there is a much higher proportion of individuals at ISCED level 3A/B (7% difference) and a somewhat lower proportion of individuals at levels 5A (2.4%) to be found in the EU-LFS compared to census data. Furthermore, the national expert managed to identify two ISCED categories that are empty in the EU-LFS, namely ISCED 0/less than ISCED 1 (0.4%) and ISCED 4A (voc) (2.6%). The latter is obviously included in ISCED 3A/B in the EU-LFS data, and the expert mentions that this is common practice in the Czech Republic. It is unclear where the difference at ISCED level 5A results from, but as the reported distributions result from different data sources, differential population coverage might be an explanation. With respect to the Polish data, category 3A/Bis again larger in the EU-LFS (by 2.8%) than in the census data, and ISCED 2 and 4C are smaller. ISCED 5B, 5A and 6 cannot be distinguished in the EU-LFS, and 5A and 5B in the census. For Estonia, there are no large discrepancies. However in the EU-LFS category 3A/B is nearly 2% larger than in the LFS, and ISCED level 5 is nearly 2% smaller (same pattern as the one found in other countries).

For Finland, ISCED levels 0 to 2 on the one hand and 3 and 4 on the other cannot be distinguished in the national data. Again, levels 3 and 4 combined are larger (4.9%) in the EU-LFS than in the national data source, and ISCED level 5A is smaller (2.8%). In addition to this, ISCED 0 to 2 (aggregated) is smaller in the EU-LFS (1.6%). With respect to Sweden, the deviations are again small (1% for ISCED 1, smaller in the EU-LFS; and 1.3% for ISCED 3, smaller in the LFS). Whereas the EU-LFS does not distinguish programme destination at ISCED level 3, this is possible with the national LFS.

For the UK, although the distributions are very similar for ISCED 0, 3A/B, 4A, 5A and 6, it is pretty unclear how ISCED 2 and 3C were constructed. There is a category in the data ('ISCED 3 (without distinction a, b or c possible, 3 y+)') that should not be necessary and is documented neither in the Eurostat nor OECD mappings for the UK. For ISCED 5B, there is a deviation of 1.3%, again the EU-LFS underreporting compared to the national LFS. In contrast to the EU-LFS, ISCED 1 could be identified

using the national data. With respect to Ireland, a higher proportion of individuals at ISCED level 3A/3B (3%) and a lower proportion of individuals at level 5A (1.1%) are again found in the EU-LFS compared to the Irish Quarterly National Household Survey. Additionally, the sub-dimensions within ISCED level 3 (apart from the marginal '3C (short)', which represents the transition year and does not count towards ISCED level 3 completion) cannot be implemented at all.

In all cases not explicitly referred to in this section, the difference between both columns is less than 1%. To summarise, with respect to the possibility to reproduce the EU-LFS distributions of the ISCED-97 from other data sets, the implementation of the ISCED-97 is quite satisfactory overall. However, there are exceptions where there are significant discrepancies between the EU-LFS and the reproduced distributions. In many countries, the EU-LFS tends to overestimate ISCED level 3A/B (Hungary: ISCED level 2) and underestimate ISCED levels 5 (and often also 6) compared to the national data sources. As this occurs so consistently, and since the national experts have independently coded the national data, it is highly probable that this is due to some systematic deviation in the application of the ISCED-97 in the EU-LFS.

Other problems are more specific to single countries. In some countries, it was impossible to reproduce the ISCED-97 as used in the EU-LFS from national data, e.g. in the Netherlands and Finland, because the national data the country experts had access to were not differentiated enough (see section 3.2.2). In the Czech Republic, France, Sweden, Slovenia and the UK, it was possible to implement the ISCED-97 in more detail than achieved in the EU-LFS. In the UK, it remained unclear how exactly the ISCED was implemented at levels 2 and 3. In France and Spain, the distributions diverge because some national categories were classified differently by the EU-LFS and the country experts (and the latter followed the OECD mappings). In a few cases, there are major deviations in the distributions between the two data sets looked at (ISCED 3A/B in the Czech Republic and ISCED 5A in Hungary) that could not be explained.

If the sub-categories A, B, C and general/vocational are ignored, the distribution in most countries boils down to a simple three-category scheme: lower secondary education and less, upper secondary education and more (but not tertiary) and tertiary education. Such a variable is actually available in the EU-LFS data as well, and Eurostat recommends using it because the high degree of aggregation leads to less problems of comparability. It can however be questioned if any substantial conclusions could be drawn from such a crude variable: Its explanatory power can be expected to be considerably lower than that of the original (national) variables. The loss of variation resulting from such a degree of aggregation also risks distorting relationships between educational attainment and other variables of interest (see Schneider, 2007).

#### 4 Summary and book outline

To summarise, there are a number of issues that lead to difficulties in the application of the ISCED-97: Firstly, educational systems evolve over time. Educational reforms, leading to changes in the qualification structure and changing standards, pose a challenge for the application of the ISCED-97 in most if not all countries. Secondly, different countries use different procedures for collecting and coding data on educational attainment. These initial conditions, e.g. the number and level of aggregation of initial response categories, sometimes already prevent a full implementation of the ISCED-97. Because of this and the fact that national educational attainment categories that involve dropouts and ‘uncertified’ education are not explicitly covered by the ISCED-97, an equivalent level of educational attainment is sometimes classified differently in different countries. Thirdly, cross-national educational attainment variables using the ISCED-97 are sometimes too undifferentiated. There are two reasons for this: On the one hand, despite the amount of detail provided for by the ISCED-97 framework, there are still cases where different educational programmes end up in the same ISCED category (e.g. *Abitur* and *Fachhochschulreife* in Germany, or HAVO and VWO diploma in the Netherlands). On the other hand, and this is probably the most important problem, cross-national surveys usually implement the ISCED-97 in a way that most or even all sub-dimensions within ISCED levels are ignored. This leads to very heterogeneous categories at some levels, particularly ISCED levels 3 and 5, and a loss of variation within countries, which may even spoil cross-national comparability in further analyses, even if the international categories are nominally comparable. Finally, it can be questioned if ‘programme destination’ is a more pertinent characteristic of educational programmes than ‘programme orientation’.

With respect to the reproducibility of the ISCED distributions found in the EU-LFS by recoding ‘indigenous’ education variables in national data sets, the results are positive overall, but with some exceptions. There is a systematic difference between the EU-LFS and the national data sources, in that the proportion of cases is larger at ISCED 3A/B and smaller at ISCED 5A in the EU-LFS. There are also a couple of instances where there are differences of more than 4% between the two distributions (Czech Republic and Hungary), and a couple of cases where the EU-LFS deviates from the reclassification suggestions in the OECD and Eurostat mappings (France and Spain). In one case (UK), the actual coding cannot be reproduced at certain levels. In other cases again, the data can be coded in more detail than suggested by the EU-LFS (Sweden, Slovenia).

The single chapters of this book present the results of the evaluation of the application of the ISCED-97 in much more detail. Each country chapter starts by describing the respective educational system and explaining how the ISCED is currently mapped to national qualifications. This mapping is then evaluated with respect to

how well national distinctions between qualifications are reflected in the ISCED-97. For many countries, a partial revision of how ISCED categories are 'mapped' to national qualifications will be suggested, and some authors even propose a revision of certain aspects of the ISCED itself in order to deal with problems revealed in the application of the ISCED-97 to their national data. Each chapter finally compares the distribution of the ISCED-97 in the EU-LFS with the distribution that the national experts derived from a large nationally representative data set by recoding the 'indigenous' education variable into the ISCED-97.

With respect to the order of the country chapters, geographically more or less close countries follow each other. This often also makes sense from a substantive point of view, as there are some commonalities within the broad regions of the European Union and between neighbouring countries. The Netherlands, Germany and France will make the start. These countries have highly differentiated educational systems with a rather high degree of stratification between general and vocational education. They are followed by Southern Europe, represented by Spain and Italy, where the general level of education is comparably lower and vocational education less traditional than in the former group of countries. Then, Central and Eastern Europe will be presented, going from South to North: Bulgaria, Slovenia, Hungary, the Czech Republic, Poland and Estonia. These countries are marked by changes in their educational systems following the collapse of the Soviet Union, and are, not unlike the continental Western European countries, rather stratified. The Scandinavian countries, Sweden and Finland, are probably least stratified nowadays, but the UK and Ireland follow closely.

## References

- Braun, M./Müller, W. (1997). Measurement of education in comparative research, *Comparative Social Research*, vol. 16, pp. 163–201.
- Brauns, H./Steinmann, S. (1999). Educational reform in France, West-Germany, and the United Kingdom. Updating the CASMIN educational classification, *ZUMA Nachrichten*, vol. 44, no. 23, pp. 7–44.
- Brauns, H./Scherer, S./Steinmann, S. (2003). The CASMIN educational classification in international comparative research, in: Hoffmeyer-Zlotnik, J./Wolf, C. (eds.): *Advances in Cross-national Comparison: A European Working Book for Demographic and Socio-Economic Variables*, New York: Kluwer Academic/Plenum Publishers, pp. 221–244.
- Erikson, R./Goldthorpe, J. H. (1992). *The Constant Flux: a Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press.
- Eurostat (2005). UOE – UNESCO-OECD-Eurostat Data Collection on Education: Mapping of National Education Programmes to ISCED-97 for School/Academic Year 2002/2003.  
[http://circa.eropa.eu/Public/irc/dsis/edtcs/library?l=/public/unesco\\_collection/programmes\\_isced97/](http://circa.eropa.eu/Public/irc/dsis/edtcs/library?l=/public/unesco_collection/programmes_isced97/) (last access 12 November 2007)

- Ganzeboom, H. B. G./Treiman, D. J. (1993). Preliminary results on educational expansion and educational achievement in comparative perspective, in: Becker, H. A./Hermkens, P. L. J. (eds.): *Solidarity of Generations: Demographic, Economic, and Social Change, and its Consequences*, Amsterdam: Thesis Publishers, pp. 467–506.
- Heath, A. F./Fisher, S./Smith, S. (2005). The globalization of public opinion research, *Annual Review of Political Science*, vol. 8, pp. 297–333.
- Kerckhoff, A. C./Dylan, M. (1999). Problems with international measures of education, *Journal of Socio-Economics*, vol. 28, no. 6, pp. 759–775.
- Kerckhoff, A. C./Ezell, E. D./Brown, J. S. (2002). Toward an improved measure of educational attainment in social stratification research, *Social Science Research*, vol. 31, no. 1, pp. 99–123.
- König, W./Lüttiner, P./Müller, W. (1988). *Eine vergleichende Analyse der Entwicklung und Struktur von Bildungssystemen. Methodologische Grundlagen und Konstruktion einer vergleichenden Bildungsskala* (CASMIN Working Paper 12), Mannheim: University of Mannheim.
- Müller, W./Karle, W. (1993). Social selection in educational systems in Europe, *European Sociological Review*, vol. 9, no. 1, pp. 1–22.
- Müller, W./Karle, W./König, W./Lüttiner, P. (1990). Class and education in industrial nations, in: Haller, M. (ed.): *Class Structure in Europe. New Findings from East-West Comparisons of Social Structure and Mobility*, Armonk (NY)/London: M. E. Sharpe, pp. 61–91. (This chapter was also published in *International Journal of Sociology*, vol. 19, no. 3, pp. 3–39.)
- OECD (1999). *Classifying Educational Programmes. Manual for ISCED-97 Implementation in OECD Countries* (first edition), Paris: OECD.  
<http://www.oecd.org/dataoecd/41/42/1841854.pdf> (last access 21 December 2007)
- OECD (2007). *Education at a Glance: OECD Indicators 2007 Edition*, Paris: OECD.  
<http://www.oecd.org/dataoecd/4/55/39313286.pdf> (last access 25 January 2008)
- Schneider, S. L. (2007). *Measuring Educational Attainment in Cross-National Surveys: The Case of the European Social Survey*, Paper presented at the EDUC Research Group Workshop of the EQUALSOC network in Dijon, France, Nov 22–24, 2007  
[http://www.nuffield.ox.ac.uk/users/Schneider/pdfs/ISCEDinESS\\_Nov2007.pdf](http://www.nuffield.ox.ac.uk/users/Schneider/pdfs/ISCEDinESS_Nov2007.pdf) (last access 25 January 2008)
- Shavit, Y./Müller, W. (eds.) (1998). *From School to Work: a Comparative Study of Educational Qualifications and Occupational Destinations*, Oxford: Clarendon Press.
- Smith, H. L./Garnier, M. (1987). Association between background and Educational Attainment in France, *Sociological Methods and Research*, vol. 14, no. 3, pp. 317–344.
- Sørensen, A. B. (1983). Processes of allocation to open and closed positions in social structure, *Zeitschrift für Soziologie*, vol. 12, no. 3, pp. 203–224.
- Treiman, D. J./Terrell, K. (1975). The process of status attainment in the United States and Great Britain, *American Journal of Sociology*, vol. 81, no. 3, pp. 563–583.
- Treiman, D. J./Yip, K.-B. (1989). Educational and occupational attainment in 21 Countries, in: Kohn, M. L. (ed.): *Cross-national Research in Sociology*, Newbury Park: Sage, pp. 373–394.
- UNESCO (1999). *Operational Manual for ISCED 1997 (International Standard Classification of Education)* (first edition), Paris: UNESCO.

- UNESCO (2006 [1997]). *International Standard Classification of Education: ISCED 1997* (re-edition), Montreal: UNESCO Institute for Statistics.  
[http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED\\_A.pdf](http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf) (last access 26 April 2007)  
A slightly modified version was also published in: Hoffmeyer-Zlotnik, J./Wolf, C. (eds.) (2003): *Advances in Cross-national Comparison: A European Working Book for Demographic and Socio-Economic variables*, New York: Kluwer Academic/Plenum Publishers.
- UNESCO Institute for Statistics (2006). *Education Counts – Benchmarking Progress in 19 WEI Countries. World Education Indicators – 2006*, Montreal: UNESCO Institute for Statistics.  
[http://www.uis.unesco.org/ev.php?ID=6833\\_201&ID2=DO\\_TOPIC](http://www.uis.unesco.org/ev.php?ID=6833_201&ID2=DO_TOPIC) (last access 25 January 2008)
- UNESCO Institute for Statistics (2007). *Global Education Digest 2007: Comparing Education Statistics Across the World*, Montreal: UNESCO Institute for Statistics.  
[http://www.uis.unesco.org/template/pdf/ged/2007/EN\\_web2.pdf](http://www.uis.unesco.org/template/pdf/ged/2007/EN_web2.pdf)
- UNESCO-UIS, OECD and Eurostat (2004). *UOE Data Collection Manual*, Paris: UNESCO-UIS, OECD and Eurostat.  
<http://www.oecd.org/dataoecd/32/53/33712760.pdf> (last access 25 January 2008)