ANNEX B

Technical notes on analyses in this volume

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USE OF TEACHER AND SCHOOL WEIGHTS

The statistics presented in this report were derived from data obtained through samples of schools, school principals and teachers. The sample was collected following a stratified two-stage probability sampling design. This means that teachers (second-stage units or secondary sampling units) were randomly selected from the list of in-scope teachers for each of the randomly selected schools (first-stage or primary sampling units). For these statistics to be meaningful for a country, they needed to reflect the whole population from which they were drawn and not merely the sample used to collect them. Thus, survey weights must be used in order to obtain design-unbiased estimates of population or model parameters.

Final weights allow the production of country-level estimates from the observed sample data. The estimation weight indicates how many population units are represented by a sampled unit. The final weight is the combination of many factors reflecting the probabilities of selection at the various stages of sampling and the response obtained at each stage. Other factors may also come into play as dictated by special conditions to maintain the unbiasedness of the estimates (e.g. adjustment for teachers working in more than one school).

Statistics presented in this report that are based on the responses of school principals and that contribute to estimates related to school principals were estimated using school weights (SCHWGT). Results based only on responses of teachers or on responses of teachers and principals (i.e. responses from school principals were merged with teachers' responses) were weighted by teacher weights (TCHWGT).

USE OF COMPLEX VARIABLES AND SCALES

Scales

In this report, several scale indices are used in regression analyses. Descriptions of the construction and validation of these scales can be found in Chapter 11 of the *TALIS 2018 Technical Report* (OECD, 2019 [1]).

Ratios and other variables derived from TALIS data

Ratio of teachers to number of teachers who permanently left the school in the 12 months prior to the survey or were absent for the prior Tuesday – Proxies of absenteeism and turnover are covered in TALIS 2018 by asking principals about the number of teachers (full-time or part-time) who were absent the most recent Tuesday that school was in session and the number of teachers who permanently left their school during the 12 months prior to the survey. Principals were asked to report the head count using the following response ranges: 0; 1-5; 6-10; 11-15; and 16 or more. Principals' responses regarding the number of absences and the number of teachers who left the schools were recoded as the low value of the response ranges: 0; 1; 6; 11 and 16. Based on this answer, a proxy of the school's teacher absence and turnover ratio was estimated for the proportion of teachers absent from their school compared to the overall teaching staff. The Chapter 2 tables displaying this ratio were prepared at the school level and, therefore, used the final school estimation weight (SCHWGT). However, reporting a ratio based on a categorical measure (head counts of absent teachers and teachers who have left) and continuous measure (overall teaching staff) leads to problematic results, as measures are heavily dependent on the school size. Therefore, results for absenteeism and turnover are not reported in the main text, but the results can be found in Tables II.2.59 and II.2.60.

Overall principals' responsibilities – For the Chapter 5 analyses, to assess overall principals' responsibilities in the decision-making process for school tasks, TALIS asked school principals to indicate who has significant responsibility for making decisions at the school level by responding to a number of statements. The school principals answered the statements with "yes" or "no", depending on who has the significant responsibility for making the decisions: the principal, other members of the school management team, teachers, school governing boards or local authorities.

A simple categorisation technique is used for the index. If the principal selected:

- the principal as having a significant responsibility in a majority of the specified tasks, the principal was considered as having an overall significant responsibility for school tasks
- the principal as having a significant responsibility in a minority of the specified tasks, the principal was not considered as having an overall significant responsibility for school tasks
- the principal as having a significant responsibility for half of the specified tasks, these cases were excluded from the index.

The questionnaire items forming these indices are the following:

- School autonomy for staffing:
  - appointing or hiring teachers
  - dismissing or suspending teachers from employment
- School autonomy for budgeting:
  - establishing teachers' starting salaries, including setting pay scales
  - determining teachers' salary increases
  - deciding on budget allocations within the school
- School autonomy for instructional policies:
  - establishing student disciplinary policies and procedures
  - establishing student assessment policies, including national/regional assessments
  - approving students for admission to the school
  - choosing which learning materials are used
  - determining course content, including national/regional curricula
  - deciding which courses are offered

The categories for the index are 1 for "Responsible" and 0 for "Not responsible".

Overall teachers' responsibilities for instructional policies – For the Chapter 5 analyses, to assess overall teachers' responsibilities in the decision-making process for school instructional policies, TALIS asked school principals to indicate who has significant responsibility for making decisions at the school level by responding to a number of statements. The school principals answered the statements with "yes" or "no", depending on who has the significant responsibility for making the decisions: the principal, other members of the school management team, teachers, school governing boards or local authorities.

A simple categorisation technique is used for the index. If the principal selected:

- teachers as having a significant responsibility in a majority of the specified tasks, teachers were considered as having an overall significant responsibility for school tasks
- teachers as having a significant responsibility for a minority of the specified tasks, teachers were not considered as having an overall significant responsibility for school tasks
- teachers as having a significant responsibility for half of the specified tasks, these cases were excluded from the index.

The questionnaire items forming these indices are the following:

- School autonomy for instructional policies
  - establishing student disciplinary policies and procedures
  - establishing student assessment policies, including national/regional assessments
  - approving students for admission to the school
  - choosing which learning materials are used
  - determining course content, including national/regional curricula
  - deciding which courses are offered

The categories for the index are 1 for "Responsible" and 0 for "Not responsible".

INTERNATIONAL AVERAGES

The OECD and TALIS averages, which were calculated for most indicators presented in this report, correspond to the arithmetic mean of the respective country estimates. When the statistics are based on responses of teachers, the OECD and TALIS averages cover, respectively, 31 and 48 countries and economies (Table AII.B.1). In those cases where the analysis is based on principals' responses, the OECD and TALIS averages cover, respectively, 30 and 47 countries and economies.

The EU total represents the 23 European Union member states that also participated in TALIS 2018 as a single entity and to which each of the 23 EU member states contribute in proportion to the number of teachers or principals, depending on the basis of the analysis. Therefore, the EU total is calculated as a weighted arithmetic mean based on the sum of final teacher (TCHWGT) or principal (SCHWGT) weights by country, depending on the target population.

Table AII.B.1 **Country coverage of international averages in TALIS 2018**

	TALIS average-48 (teachers)	TALIS average-47 (principals)	OECD average-31 (teachers)	OECD average-30 (principals)	EU total-23
Alberta (Canada)	x	x	x	x	–
Australia	x	–	x	–	–
Austria	x	x	x	x	x
Belgium	x	x	x	x	x
Flemish Comm. (Belgium)	–	–	–	–	–
French Comm. (Belgium)	–	–	–	–	–
Brazil	x	x	–	–	–
Bulgaria	x	x	–	–	x
CABA (Argentina)*	x	x	–	–	–
Chile	x	x	x	x	–
Colombia[1]	x	x	x	x	–
Croatia	x	x	–	–	x
Cyprus	x	x	–	–	x
Czech Republic	x	x	x	x	x
Denmark	x	x	x	x	x
England (UK)	x	x	x	x	x
Estonia	x	x	x	x	x
Finland	x	x	x	x	x
France	x	x	x	x	x
Georgia	x	x	–	–	–
Hungary	x	x	x	x	x
Iceland	x	x	x	x	–
Israel	x	x	x	x	–
Italy	x	x	x	x	x
Japan	x	x	x	x	–
Kazakhstan	x	x	–	–	–
Korea	x	x	x	x	–
Latvia	x	x	x	x	x
Lithuania	x	x	x	x	x
Malta	x	x	–	–	x
Mexico	x	x	x	x	–
Netherlands	x	x	x	x	x
New Zealand	x	x	x	x	–
Norway	x	x	x	x	–
Portugal	x	x	x	x	x
Romania	x	x	–	–	x
Russian Federation	x	x	–	–	–
Saudi Arabia	x	x	–	–	–
Shanghai (China)	x	x	–	–	–
Singapore	x	x	–	–	–
Slovak Republic	x	x	x	x	x
Slovenia	x	x	x	x	x
South Africa	x	x	–	–	–
Spain	x	x	x	x	x
Sweden	x	x	x	x	x
Chinese Taipei	x	x	–	–	–
Turkey	x	x	x	x	–
United Arab Emirates	x	x	–	–	–
United States	x	x	x	x	–
Viet Nam	x	x	–	–	–

* CABA (Argentina): Ciudad Autónoma de Buenos Aires, Argentina.

1. On 25 May 2018, the OECD Council invited Colombia to become a Member. While Colombia is included in the OECD averages reported in this publication, at the time of its preparation, Colombia was in the process of completing its domestic procedures for ratification and the deposit of Colombia's instrument of accession to the OECD Convention was pending.

In this publication, the OECD average is generally used when the focus is on providing a global tendency for an indicator and comparing its values across education systems. In the case of some countries and economies, data may not be available for specific indicators, or specific categories may not apply. Therefore, readers should keep in mind that the term "OECD average" refers to the OECD countries and economies included in the respective comparisons. In cases where data are not available or do not apply to all sub-categories of a given population or indicator, the "OECD average" may be consistent within each column of a table but not necessarily across all columns of a table.

STANDARD ERRORS AND SIGNIFICANCE TESTS

The statistics in this report represent estimates based on samples of teachers and principals, rather than values that could be calculated if every teacher and principal in every country had answered every question. Consequently, it is important to measure the degree of uncertainty of the estimates. In TALIS, each estimate has an associated degree of uncertainty that is expressed through a standard error. The use of confidence intervals provides a way to make inferences about the population means and proportions in a manner that reflects the uncertainty associated with the sample estimates. From an observed sample statistic and assuming a normal distribution, it can be inferred that the corresponding population result would lie within the confidence interval in 95 out of 100 replications of the measurement on different samples drawn from the same population. The reported standard errors were computed with a balanced repeated replication (BRR) methodology.

Differences between sub-groups

Differences between sub-groups along teacher (e.g. female teachers and male teachers) and school characteristics (e.g. schools with a high concentration of students from socio-economically disadvantaged homes and schools with a low concentration of students from socio-economically disadvantaged homes) were tested for statistical significance. All differences marked in bold in the data tables of this report are statistically significantly different from 0 at the 95% level.

In the case of differences between sub-groups, the standard error is calculated by taking into account that the two sub-samples are not independent. As a result, the expected value of the covariance might differ from 0, leading to smaller estimates of standard error as compared to estimates of standard error calculated for the difference between independent sub-samples.

Tables presenting the proportion of teachers and principals, by the breakdown variables of teacher and school characteristics (Tables AII.B.3, AII.B.4, AII.B.5 and AII.B.6) can be found in Annex C.

Differences between cycles

Differences between TALIS cycles (e.g. change between 2013 and 2018) were tested for statistical significance. All differences marked in bold in the data tables of this report are statistically significant at the 95% level. As samples from different TALIS cycles are considered independent, the standard error for any comparison between cycles is calculated with the expected value of the covariance being equal to 0.

STATISTICS BASED ON REGRESSIONS

Regression analysis was conducted to explore the relationships between different variables. Multiple linear regression was used in those cases where the dependent (or outcome) variable was considered continuous. Binary logistic regression was employed when the dependent (or outcome) variable was a binary categorical variable. Regression analyses were carried out for each country separately. Similarly to other statistics presented in this report, the OECD and TALIS averages refer to the arithmetic mean of country level estimates, while the EU total is calculated as a weighted arithmetic mean based on the sum of final teacher (TCHWGT) or principal (SCHWGT) weights by country, depending on the target population.

Control variables included in a regression model are selected based on theoretical reasoning and, preferably, limited to the most objective measures or those that do not change over time. Controls for teacher characteristics include: teacher's gender, age, employment status (i.e. full-time/part-time) and years of teaching experience. Controls for class characteristics include: variables of classroom composition (i.e. share of students whose first language is different from the language of instruction, low academic achievers, students with special needs, students with behavioural problems, students from socio-economically disadvantaged homes, academically gifted students, immigrant students or students with an immigrant background, refugee students) and class size.

In the case of regression models based on multiple linear regression, the explanatory power of the regression models are also highlighted by reporting the R-squared (R^2), which represents the proportion of the observed variation in the dependent (or outcome) variable that can be explained by the independent (or explanatory) variables.

In order to ensure the robustness of the regression models, independent variables were introduced into the models in steps. This approach also required that the models at each step be based on the same sample. The restricted sample used for the different versions of the same model corresponded to the sample of the most extended (i.e. with the maximum number of independent variables) version of the model. Thus, the restricted sample of each regression model excluded those observations where all independent variables had missing values.

Multiple linear regression analysis

Multiple linear regression analysis provides insights into how the value of the continuous dependent (or outcome) variable changes when any one of the independent (or explanatory) variable varies while all other independent variables are held constant. In general, and with everything else held constant, a one-unit increase in the independent variable (X_i) increases, on average, the dependent variable (Y) by the units represented by the regression coefficient (β_i):

$$Y = \beta_0 + \beta_1 X_1 + \ldots + \beta_j X_j + \varepsilon$$

When interpreting multiple regression coefficients, it is important to keep in mind that each coefficient is influenced by the other independent variables in a regression model. The influence depends on the extent to which independent variables are correlated. Therefore, each regression coefficient does not capture the total effect of independent variables on dependent variables. Rather, each coefficient represents the additional effect of adding that variable to the model, if the effects of all other variables in the model are already accounted for. It is also important to note that, because cross-sectional survey data were used in these analyses, no causal conclusions can be drawn.

Regression coefficients in bold in the data tables presenting the results of regression analysis are statistically significantly different from 0 at the 95% confidence level.

Binary logistic regression analysis

Binary logistic regression analysis enables the estimation of the relationship between one or more independent (or explanatory) variables and the dependent (or outcome) variable with two categories. The regression coefficient (ß) of a logistic regression is the estimated increase in the log odds of the outcome per unit increase in the value of the predictor variable.

More formally, let Y be the binary outcome variable indicating no/yes with 0/1, and p be the probability of Y to be 1, so that p = prob(Y=1). Let $X_1,...X_k$ be a set of explanatory variables. Then, the logistic regression of Y on $X_1,...X_k$ estimates parameter values for $ß_0, ß_1, . . . , ß_k$ via the maximum likelihood method of the following equation:

$$Logit(p) = log(p/(1-p)) = ß_0 + ß_1X_1 + ... + ß_kX_k$$

Additionally, the exponential function of the regression coefficient (*exp(ß)*) is obtained, which is the odds ratio (OR) associated with a one-unit increase in the explanatory variable. Then, in terms of probabilities, the equation above is translated into the following:

$$p = exp(ß_0 + ß_1X_1 + ... + ß_kX_k)/(1+exp(ß_0 + ß_1X_1 + ... + ß_kX_k))$$

The transformation of log odds (ß) into odds ratios (*exp(ß)*; OR) makes the data more interpretable in terms of probability. The odds ratio (OR) is a measure of the relative likelihood of a particular outcome across two groups. The odds ratio for observing the outcome when an antecedent is present is:

$$OR = (p_{11}/p_{12})/(p_{21}/p_{22})$$

where p_{11}/p_{12} represents the "odds" of observing the outcome when the antecedent is present, and p_{21}/p_{22} represents the "odds" of observing the outcome when the antecedent is not present. Thus, an odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable with two categories (e.g. yes/no) or more than two categories. An odds ratio below one denotes a negative association; an odds ratio above one indicates a positive association; and an odds ratio of one means that there is no association. For instance, if the association between being a female teacher and having chosen teaching as first choice as a career is being analysed, the following odds ratios would be interpreted as:

- **0.2:** Female teachers are five times less likely to have chosen teaching as a first choice as a career than male teachers.
- **0.5:** Female teachers are half as likely to have chosen teaching as a first choice as a career than male teachers.
- **0.9:** Female teachers are 10% less likely to have chosen teaching as a first choice as a career than male teachers.
- **1:** Female and male teachers are equally likely to have chosen teaching as a first choice as a career.
- **1.1:** Female teachers are 10% more likely to have chosen teaching as a first choice as a career than male teachers.
- **2:** Female teachers are twice more likely to have chosen teaching as a first choice as a career than male teachers.
- **5:** Female teachers are five times more likely to have chosen teaching as a first choice as a career than male teachers.

The odds ratios in bold indicate that the relative risk/odds ratio is statistically significantly different from 1 at the 95% confidence level. To compute statistical significance around the value of 1 (the null hypothesis), the relative-risk/odds-ratio statistic is assumed to follow a log-normal distribution, rather than a normal distribution, under the null hypothesis.

The logistic models described in Tables II.2.53, II.2.54, II.2.55 and II.2.56 (Chapter 2) measure how the probability of experiencing work-related stress "a lot" (binary outcome variable) varies across teachers as a function of specific task intensities (expressed in number of hours, i.e. continuous explanatory variable) and of their quadratic terms, to take into account possible nonlinearities.

Once estimated, the coefficients of the logistic model are converted into probabilities as follows:

$$P(Y = 1|intensity_i) = \frac{exp^{(\beta_0+\beta_1 \cdot intensity_i+\beta_2 \cdot intensity_i{}^2)}}{1 + (\beta_0 + \beta_1 \cdot intensity_i + \beta_2 \cdot intensity_i{}^2)}$$

Where

- P(Y=1 | intensity) is the probability of experiencing work-related stress "a lot", given the number of hours task *i* is performed (intensity *i*, with *i* being teaching, individual planning or preparation of lessons, marking/correcting student work, general administrative work)
- β_0, β_1, β_2 are the coefficients of the logistic model, β_0 being the intercept

Finally, the probability of experiencing work-related stress "a lot" at a given task intensity is multiplied by 100 in order to obtain the expected share of teachers experiencing stress in their work "a lot" at the given task intensity.

STATISTICS BASED ON MULTILEVEL MODELS: INTRA-CLASS CORRELATION COEFFICIENT

Statistics based on multilevel models, which are displayed in Chapters 2 and 4, include variance components (between- and within-school variance), and the intra-class correlation coefficient derived from these components. Multilevel models are specified as two-level regression models (the teacher and school levels), with normally distributed residuals, and estimated with maximum likelihood estimation. Models were estimated using the Stata (version 15.1) "mixed" module.

The intra-class correlation coefficient represents the share of the variance that lies between the cluster variable, in this case schools, and it is defined and estimated as:

$$100 \times \frac{\sigma_B^2}{\sigma_W^2 + \sigma_B^2}$$

Where σ_B^2 and σ_W^2 , respectively, represent the between- and within-variance estimates.

Standard errors in statistics estimated from multilevel models

For statistics based on multilevel models, such as the estimates of variance components, the standard errors are not estimated with the usual replication method, which accounts for stratification and sampling rates from finite populations. Instead, standard errors are "model-based": their computation assumes that schools, and teachers within schools, are sampled at random (with sampling probabilities reflected in school and teacher weights) from a theoretical, infinite population of schools and teachers, which complies with the model's parametric assumptions. The standard error for the estimated index of inclusion is calculated by deriving an approximate distribution for it from the (model-based) standard errors for the variance components, using the delta method.

PEARSON CORRELATION COEFFICIENT

Correlation coefficient measures the strength and direction of the statistical association between two variables. Correlation coefficients vary between -1 and 1; values around 0 indicate a weak association, while the extreme values indicate the strongest possible negative or positive association. The Pearson correlation coefficient (indicated by the letter r) measures the strength and direction of the linear relationship between two variables.

In this report, Pearson correlation coefficients are used to quantify relationships between country-level statistics.

CHANGES BETWEEN TALIS CYCLES AND IMPLICATIONS FOR ANALYSES

Change in the definition of the target population between TALIS cycles

The third TALIS cycle (i.e. TALIS 2018) allows analysis of changes over a 10-year period. Nevertheless, such analysis poses particular challenges and, therefore, requires caution. The various challenges include: country coverage and the target population within a given country may differ across cycles; the variables of interest could change, in addition, through changes in the questionnaires; moreover, the context of teaching and learning might also change. Therefore, comparisons across cycles need to be interpreted with care.

In TALIS 2008, teachers whose teaching is directed entirely or mainly at students with special needs were not part of the target population. However, this changed for TALIS 2013 and 2018, as teachers of special needs students got included in the target population. Hence, estimates representing the change from 2008 to 2013 and from 2008 to 2018 need to interpreted with caution. Nevertheless, it is important to note that teachers who work in schools that teach only special needs students were excluded from all TALIS cycles.

In the case of New Zealand, the definition of the target population has changed between TALIS 2013 and TALIS 2018. While, in 2013, schools with four or fewer eligible teachers were excluded, it was no longer the case in 2018. As a result, a filter variable (TALIS13POP), which excludes schools with four or fewer teachers for New Zealand, was used to estimate 2018 statistics for New Zealand in order to ensure comparability in data tables representing changes over time. Therefore, these results can differ from those reported for the full TALIS 2018 sample of New Zealand, especially for those based on principals' reports.

Table AII.B.2 **Correspondence between ISCED-2011 and ISCED-97 levels used in TALIS 2018 publications**

TALIS 2008	TALIS 2013		TALIS 2018	
ISCED-97	ISCED-97	ISCED-97 categories	ISCED-2011	ISCED-2011 categories
–	–	–	Level 0	**Early childhood education** Refers to early childhood programmes that have an intentional education component and aim to develop cognitive, physical and socio-emotional skills necessary for participation in school and society. Programmes at this level are often differentiated by age.
–	–	–	Level 01	*Early childhood educational development*
Level 0	Level 0	**Pre-primary education** Initial stage of organised instruction, designed primarily to introduce very young children to a school-type environment.	Level 02	*Pre-primary education*
Level 1	Level 1	**Primary education or first stage of basic education** Normally designed to give students a sound basic education in reading, writing and mathematics.	Level 1	**Primary education** Designed to provide a sound basic education in reading, writing and mathematics and a basic understanding of some other subjects. Entry age: between 5 and 7. Typical duration: 6 years.
Level 2	Level 2	**Lower secondary education or second stage of basic education** The lower secondary level of education generally continues the basic programmes of the primary level, although teaching is typically more subject-focused, often employing more specialised teachers who conduct classes in their field of specialisation.	Level 2	**Lower secondary education** Completes provision of basic education, usually in a more subject-oriented way with more specialist teachers. Programmes may differ by orientation, general or vocational, though this is less common than at upper secondary level. Entry follows completion of primary education and typical duration is 3 years. In some countries, the end of this level marks the end of compulsory education.
Level 3	Level 3	**Upper secondary education** The final stage of secondary education in most OECD countries. 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 than at ISCED 2.[1]	Level 3	**Upper secondary education** Stronger specialisation than at lower secondary level. Programmes offered are differentiated by orientation: general or vocational. Typical duration is 3 years.
Level 4	Level 4	**Post-secondary non-tertiary education** These programmes 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 postsecondary programmes in a national context.[2]	Level 4	**Post-secondary non-tertiary education** Serves to broaden rather than deepen the knowledge, skills and competencies gained in the upper secondary level. Programmes may be designed to increase options for participants in the labour market, for further studies at tertiary level, or both. Usually, programmes at this level are vocationally oriented.
Level 5	Level 5	**First stage of tertiary education** ISCED 5 programmes have an educational content more advanced than those offered at Levels 3 and 4.	–	–
Level 5B	*Level 5B*	*ISCED 5B programmes that are generally more practical/technical/occupationally specific than ISCED 5A programmes.*	Level 5	**Short-cycle tertiary education** Serves to deepen the knowledge developed at previous levels by imparting new techniques, concepts and ideas not generally covered in upper secondary education.
Level 5A Bachelor's degree	*Level 5A*	*ISCED 5A programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements.*	Level 6	**Bachelor's or equivalent level** Designed to provide participants with intermediate academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. Typical duration: 3-4 years full-time study.
Level 5A Master's degree			Level 7	**Master's or equivalent level** Stronger specialisation and more complex content than bachelor's level. Designed to provide participants with advanced academic and/or professional knowledge. May have a substantial research component.
Level 6	Level 6	**Second stage of tertiary education** This level is reserved for tertiary programmes that lead to the award of an advanced research qualification. The programmes are devoted to advanced study and original research.	Level 8	**Doctoral or equivalent level** Designed to lead to an advanced research qualification. Programmes at this level are devoted to advanced study and original research, and exist in both academic and professional fields.

1. There are substantial differences in the typical duration of ISCED 3 programmes, both across and between countries, typically ranging from two to five years of schooling.

2. They are often not significantly more advanced than programmes at ISCED 3, but they serve to broaden the knowledge of participants who have already completed a programme at Level 3. The students are typically older than those in ISCED 3 programmes.

Source: UNESCO-UIS (2012[2]), *International Standard Classification of Education: ISCED 2011, UNESCO Institute for Statistics*, Montreal, http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf.

Change in the ISCED classification

The classification of levels of education is based on the International Standard Classification of Education (ISCED). ISCED is an instrument for compiling statistics on education internationally. In TALIS 2008 and 2013, ISCED-97 was used to report on teachers' and principals' educational attainment. The first classification, ISCED-97, was revised and the new one, ISCED-2011, was formally adopted in November 2011. ISCED-2011 is the basis of the education levels presented in the TALIS 2018 questionnaires for teachers and for school principals. The data tables reporting teachers' and principals' educational attainment in this report are based on ISCED-2011. A correspondence table (Table AII.B.2) was used to translate ISCED-97 education categories used in TALIS 2008 and 2013 into the categories of the new ISCED-2011, in order to produce tables reporting changes in teachers' and principals' educational attainment from 2008 to 2018. This correspondence table was used to compile Tables I.4.11 and I.4.27 in Chapter 4 of Volume I. However, changes over time in teachers' and principals' educational attainment will need to be interpreted with caution because of the change in the classification.

For certain countries, the correspondence between ISCED-97 and ISCED-2011 was revised to reflect country specificities, compared to the general approach presented in Table AII.B.2. As a result, for Tables I.4.11 and I.4.27, ISCED-97 level 5B was reclassified as ISCED-2011 level 6 in the cases of Italy and the Flemish Community of Belgium.

In Austria, the former "Pädagogische Akadmie" (pedagogical academy, ISCED-97 level 5B) was transformed into "Pädagogische Hochschule" (university college of teacher education, ISCED-2011 level 6) in 2007. Thus, in the case of Austria, the large change from 2008 to 2018 in ISCED levels 5 and 6 in Tables I.4.11 and I.4.27 is not only caused by the change in ISCED classification, but it is also a result of the change in the system of teacher education.

In Portugal, the teachers with a "pre-Bologna master's degree" are categorised as ISCED level 6. The question is presented in a way that prevents the disaggregation between "pre-Bologna master's degree" and "doctorate degree".

In Slovenia, teachers with a "pre-Bologna bachelor's degree" are categorised as ISCED level 5 (which typically corresponds to short-term tertiary education). The question is presented in a way that prevents the disaggregation between "pre-Bologna bachelor's degree" and "bachelor's degree".

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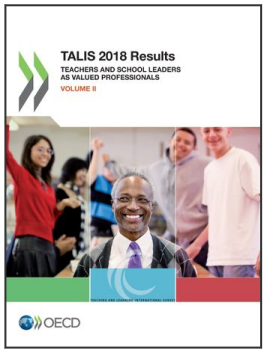

From:

TALIS 2018 Results (Volume II)

Teachers and School Leaders as Valued Professionals

Access the complete publication at:

https://doi.org/10.1787/19cf08df-en

Please cite this chapter as:

OECD (2020), "Technical notes on analyses in this volume", in *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/000938d6-en

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