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## Economic Commission for Europe

### Conference of European Statisticians

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Item 7b of the provisional agenda

**Discussion to obtain input to the in-depth review of education statistics to be carried out by the Bureau of the Conference of European Statisticians in autumn 2011**

### Review of education statistics

#### Note by the Australian Bureau of Statistics

##### *Summary*

The Bureau of the Conference of European Statisticians selected at its November 2010 meeting the topic of education statistics for an in-depth review by the Bureau in 2011 (see document ECE/CES/2011/13, the report of the meeting). The purpose of the review is to provide an overview of international statistical work in the area, identify challenges and propose a way forward.

Furthermore, the Bureau decided to discuss the topic of education statistics at the Conference's June 2011 plenary session to obtain input from the members of the Conference for the review. The note to provide basis for the discussion is prepared by Australia. Following the discussion at the plenary session of the Conference, the topic will be reviewed in depth by the Bureau in November 2011.

## **I. Introduction**

1. The main purpose of this review is to highlight some of the current activities and future directions for education statistics. Given the intrinsic value of education to the global economy and community, a review of the strategic issues affecting education statistics is vital for targeted policies and reforms at the local level.
2. The Australian Government's Productivity Agenda recognises the need to support investment in skills and human capital, including measures to enhance teacher quality, improve the quality of early childhood education, and achieve ambitious targets for higher educational attainment rates.
3. To help inform these and other international priorities in the education arena, this paper delivers an assessment of key conceptual and coordination issues surrounding the production of quality education data. Central to this review is the identification of information gaps, duplication of work, and possible strategies for meeting the challenges faced by collectors and users of education statistics, in Europe and beyond.

## **II. International organizations' activities relating to education statistics**

### **A. Eurostat**

4. The work of Eurostat reflects the goals set by the European Commission. The first goal for education is to improve the quality and effectiveness of education and training services, for example through teacher training and learning technologies. The second is for inclusivity, ensuring that everyone has access to such services. The final goal is international accessibility, with the intent of opening up Europe's educational institutions to the wider world. Other areas of emphasis are the efficiency of investments in education, language learning, flexibility of learning, student mobility, and citizenship education.
5. In line with these goals, the Eurostat 2010 work program included:
  - (a) Finalisation of the preparation of the continuing vocational training survey and adult education survey;
  - (b) Further work on consolidating the methodology and production process for data on educational attainment coming from various European social surveys;
  - (c) Continued contribution to the revision of the International Standard Classification of Education (ISCED) in cooperation with the Organisation for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organization (UNESCO);
  - (d) The processing and dissemination of data on young peoples' transition to the labour market;
  - (e) New projects on lifelong learning, student mobility, and statistics on pupils with Special Education Needs.
6. Other publications from Eurostat present regular overviews on education data in Europe, highlighting how European countries are responding to the challenges faced by their education systems. Recent publications are presented in the context of the global financial crisis and the significant impact it has had on economic, social and political life.

The 2009 release of *Key Data on Education in Europe* (7<sup>th</sup> edition) argues that for long-term economic and social stability to be reinstated in this climate by a Union which spends almost 11 per cent of its budget on education, it is crucial that education expenditure must be as efficient and inclusive as possible.

## **B. Organisation for Economic Co-operation and Development**

7. The 2010 OECD statistical work program for education and training statistics highlights a number of areas of analytical focus.

8. The Assessment of Higher Education Learning Outcomes (AHELO) feasibility study will assess whether the knowledge and skills of undergraduate students can be measured and compared internationally. The objective for 2010 was to commence development, adaption and translation of the assessment and survey instruments for international use, as well as to undertake small pilot studies of these instruments.

9. Other major activities of OECD include the Indicators of Education Systems (INES) program, which provides methodological guidance on the development of internationally comparable data and indicators on education systems. For 2010, the goal was to produce and publish indicators and analytical outputs on the operation, impact and outcomes of various stages of learning and training throughout life, including an emphasis on early childhood. Key activities for the year included the production of universal technical documentation on the collection of education data, and the development of various indicators, namely the value of education, the relationship between earnings and levels of educational attainment, the social outcomes of education, as well as the ways in which education systems monitor performance in schools. The INES program has also continued to assist in the revisions of ISCED.

10. In line with the INES initiatives, the OECD work program has set a goal to create an international dataset and associated indicators on educational facilities, with the first phase of the Centre for Effective Learning Environments (CELE) 'International Profile on Educational Facilities Policy and Practice' pilot project on Evaluating quality in Educational Spaces (EQES) completed in 2010. Results were discussed by national project leaders in July 2010 and a comprehensive report on the project is forthcoming.

11. Measurement of human capital was also a feature of the OECD 2010 work program, with the aim to produce estimates of the stock of human capital for the joint Taskforce on Sustainable Development Indicators by the OECD/Eurostat and the United Nations Economic Commission for Europe (UNECE).

12. Since its launch in 2009, the OECD has also continued to maintain a statistical and information sharing community entitled 'Wikiprogress' as the official platform for the OECD-hosted Global Project on 'Measuring the Progress of Societies'. The aim of the wiki platform is to stimulate global discussions about the development of progress indicators as well as the fundamental issues concerning the measurement of the wellbeing of societies, such as the quality of education.

13. Other areas of continued work by the OECD are its Programme for International Student Assessment (PISA), Programme for the International Assessment of Adult Competencies (PIAAC), and the Teaching and Learning International Survey (TALIS).

## **C. United Nations Educational, Scientific and Cultural Organization**

14. The UNESCO Institute for Statistics (UIS) current work program for education includes a continued effort to work in conjunction with the OECD and Eurostat to improve

the quality of education data from annual surveys across all levels of formal education, as well as literacy and educational attainment.

15. One of the Institute's biggest priorities is its work in developing benchmarks and monitoring international goals in education, particularly the Millennium Development Goals and the 'Education for All' initiatives. In line with this work, the UIS is giving priority to three themes in education: literacy, teachers, and skill development for the workforce. It is also committed to a more holistic assessment of education in which inclusive life-long learning in both formal and non-formal settings is fundamental.

16. Work in these areas requires the continued development and maintenance of key education measures and classification frameworks and new indicator methodologies. These have all been listed as a priority in the UNESCO work program, as has the continued development of statistical capacity at the national level, with particular focus on Africa and Asia.

#### **D. World Bank**

17. Priorities outlined by the World Bank in 2010 have included the need for targeted and effective measures for enhancing early childhood education and development. With emphasis on the latter, the Bank published a report in 2010 on *The Promise of Early Childhood Development in Latin America and the Caribbean*, making the claim that investment in proper care and learning opportunities at an early age is the most cost-effective way to ensure positive outcomes in educational attainment in the future. The Bank also underlined the importance of child health and nutrition in childhood development and future achievement in a report on *Rethinking School Feeding: Social Safety Nets, Child Development and the Education Sector*, undertaken in partnership with the UN World Food Program.

#### **E. Nordic Social-Statistical Committee**

18. A recent project by the Nordic Social-Statistical Committee (NOSOSCO) emphasised the future challenges of the welfare model in Nordic countries (published in Norwegian 2009 and in English in 2010). Data was sourced from the European Union Statistics on Income and Living Conditions (EU-SILC), a household sample survey carried out with the support of Eurostat. Education plays a key role in the study, with a focus on the employment, economic and living conditions of people with different levels of education. Work-based training and further education was also a feature, highlighting the effect that further training has on employment opportunities and worker productivity.

### **III. Developments in education statistics in Australia**

19. While the Australian Bureau of Statistics (ABS) conducts regular national household-based surveys of education and training, education data from administrative sources has historically been collected, managed and reported through a jurisdictional approach, focusing predominately on activities within individual education sectors. This reflects the respective responsibilities of the Federal and State/Territory spheres of government in Australia. The ABS is proposing a way to revolutionise the reporting and potential application of Australian education data through an Australian Longitudinal Learning Database (ALLD).

## **A. Australian Longitudinal Learning Database**

20. The ABS plans to create and maintain an enduring database which would link microdata on the pathways and outcomes of Australian students from early childhood education to schooling, post-school education and ultimately labour force outcomes. The proposed Australian Longitudinal Learning Database (ALLD) would be constructed from existing administrative data, and, with community support, could include data drawn from the Census of Population and Housing as well as surveys into a central, statistical and research base. Using existing data sources in place of new collections will provide a richer picture of the socio-demographic characteristics of populations, while reducing unnecessary duplication and limiting respondent burden.

21. Information derived from the ALLD would allow governments and researchers to develop a better understanding of the drivers and underlying factors affecting student progress and outcomes. It would facilitate improved measurement of participation in early childhood education, school performance and social inclusion, and inform national agreement reporting through the Council of Australian Governments (COAG) and other monitoring processes.

22. While data linkage has been successfully used by health researchers in Australia for some time, this is a relatively new area in education and training research. The ABS is currently in the early stages of establishing a set of feasibility studies through the 2011 Census Data Enhancement Quality Studies program, as a precursor to the development of the ALLD.

23. Aside from the ALLD project, another way in which the ABS is providing statistical leadership in areas relevant to education is in its commitment to the development of measures of human capital, as showcased by its published work and contributions to Australian and international conferences. For further discussion of this work, see the relevant section under IV. Issues and Challenges (below).

## **B. Early childhood education and care statistics**

24. In 2011, the ABS will publish the first estimates of preschool education from a new National Early Childhood Education and Care collection. National data collection arrangements were established under an information agreement signed by relevant state and territory authorities and the Commonwealth Department of Education, Employment and Workplace Relations (DEEWR). The data collection will support monitoring progress against the Universal Access commitment (to quality early childhood education in the year before full time schooling) under the COAG National Partnership Agreement on Early Childhood Education.

## **C. Australian Early Development Index**

25. COAG has endorsed the Australian Early Development Index (AEDI), a tool for measuring childhood development which was based on the Canadian Early Development Instrument (EDI; see III below). The first nationwide implementation of the AEDI was in 2009, with information collected on Australian children in their first year of full-time school. Initial results from the AEDI provide information on how children are faring in the areas of emotional maturity, social competence, physical health and wellbeing, school-based language and cognitive skills, communication skills and general knowledge. Key findings from the first AEDI study highlighted the diversity in languages spoken at home by young children and the prevalence of non-parental care and education programs. Also of

particular interest was the number of children with special needs (physical, intellectual and medical), as well as the types of children who were developmentally vulnerable in the five AEDI domains.

#### **D. Reporting school outcomes**

26. A My School website has been developed by the Australian Curriculum and Reporting Authority (ACARA), an independent authority that is responsible for publishing nationally comparable data on Australian schools. The publicly accessible My School website provides detailed information about almost 10,000 schools in Australia. It uses a new index of student and school characteristics, developed specifically for the purpose of identifying schools serving similar student populations. With continued demand for accountability and transparency in education, the website reports each schools average scores on numeracy and literacy national assessments.

27. The 2011 update of the My School website will also include student progress information for students who undertook literacy and numeracy testing in both 2008 and 2010. This cohort analysis will allow comparisons to be made between the performance of schools with students from similar socio-economic backgrounds over time. Discussion around these developments has raised questions about the appropriateness of using area-based indexes as a proxy for socio-economic status at the person level, highlighting the need for better measures of socio-economic status which distinguish individuals from the areas in which they live.

#### **E. Vocational education research**

28. The work of the National Centre for Vocational Education Research (NCVER) has focused on participation in the Australian vocational education and training sector. A large part of NCVER's recent emphasis has been on participation in vocational education in light of changing work and lifestyle patterns, as well as the role that human capital plays in terms of economic productivity and skill requirements across different countries and over time. There has also been research in the areas of social inclusion, life-long learning, and the quality of vocational education institutions, their courses and their teachers.

### **IV. Other leading activities in education statistics**

29. Recent activities by Statistics Canada emphasise changing trends in the attainment of immigrants, adult learning, access to education and labour force outcomes. Other continuing initiatives in Canada include the implementation and analysis of the EDI, a population level measurement of school readiness. The provincial government of Manitoba is currently working on linking the EDI to other data sources on health, schooling and attainment information as part of its longitudinal study into the lifelong effects of early childhood development.

30. Like Canada, recent reports from Statistics New Zealand have addressed differences in outcomes of the university-educated immigrant population. Other work has focused on student loans and allowances, income and employment outcomes of tertiary education, pathways of school leavers without qualifications, and a review of the statistical measurement of human capital.

## V. Issues and challenges

31. The information presented in this review highlights general issues and challenges for consideration by the international community for future developments in education statistics:

### A. Measurement of human capital and the value of education

32. Human capital can be broadly defined as the productive capacity embodied in individuals. A person's productive capacity is related to a variety of factors, such as knowledge and skills, physical and mental conditions, life experience and attitude. As the 'knowledge and skills' is the most important determinant in a person's productive capacity, human capital can be also defined as the knowledge and skills embodied in individuals.

33. Contributing to the measurement of the knowledge and skills component of human capital has presented itself as a common theme throughout international activities in education statistics, though not always explicitly defined as such. The issue has been presented in various ways, such as analyses of transitions to work, job-skills matches and mismatches, the need to up-skill or re-skill for certain occupations, as well as the prospect of losing skills due to under-utilisation in the workforce. All of these topics highlight a need for established and comparable measures of the knowledge and skills that contribute to human capital through the valuation of education.

34. The challenge to develop better ways of fully understanding and measuring human capital continues to be met by various statistical agencies and collaborations around the world, such as the joint OECD/UNECE/Eurostat Task Force for Measuring Sustainable Development, which met in Geneva in November 2010 to discuss the issue as part of its overall agenda. To date, an OECD database has been set up to gather the essential information needed to measure the stock of human capital for partner countries based on the selected methodology. Second, based on this database, preliminary estimates of the value of human capital for the population of working age have been generated for the majority of the countries participating in the consortium.

35. Since 2001, the ABS has contributed to the advancement of measures of education based contributions to human capital in a variety of ways. Emphasis on the value of education has been addressed through work in the following areas:

(a) Measuring the formation of human capital by analysing how investment in education and net migration contribute to the growth of human capital stock, acknowledging the depreciating effect of an ageing population);

(b) Providing quantitative evidence of the economic benefits of completing secondary education; and

(c) Establishing the rate of return of post-school education in Australia, especially for bachelor degrees.

36. Notwithstanding these advancements, the complexities surrounding the measurement of human capital and the value of education remain an issue which requires further examination.

### B. Measurement of social inclusion

37. Another topical theme is inclusivity in education. This is manifested in the 'Education for All' initiatives of UNESCO and the World Bank, as well as the goals of the

European Commission. Conceptual and methodological issues surrounding the measurement of social inclusion, as both a component and outcome of education, remain a key area of concern in many countries. The ABS proposal for the ALLD and the Manitoban Government's data linkage project are both tools which can be used to help measure social inclusion by assessing the lifelong impacts of education and conversely, the outcomes of non-participants in various stages of education. Statistics which better enable examination of those who face barriers, to education or to greater participation in cultural, economic and political life as a result of their educational status, are invaluable to social inclusion policy. Indicators of social inclusion have been developed in Australia by the Department of Prime Minister and Cabinet.

38. In this sense, the challenge for the international community is to not only develop consistent conceptual definitions of what social inclusion is and how it should be measured, but also to develop appropriate instruments and methodologies to gather data on the topic. This may involve a review of survey programs and the use of administrative data, as well as a determined effort to introduce new data items for collection, such as the perceptions around barriers to learning/barriers as a result of level of educational attainment, wherever necessary.

### **C. Longitudinal education datasets and data linkage initiatives**

39. As the overview of international activities has shown, there is increasing recognition of the need for longitudinal data on education. Of particular interest in the international community is how individual countries can link various data sources to assess alternative education pathways and the outcomes of education over time.

40. There are a number of challenges to achieving successfully linked datasets of longitudinal information. Firstly, where linked datasets are concerned, the statistical infrastructure must be sufficient to support adequate data linkage between different sources of information. This may be administrative data, survey or census data, or data from different periods in time or place. Privacy concerns must also be managed appropriately to ensure that data linkage is done in accordance with legislative requirements and is fit for purpose. Governance arrangements for access to and storage of data must also be confirmed prior to any data linkage activities. Moreover, the quality of any data linkage will also have to be managed and accounted for in any research or outputs produced.

41. While there are a number of issues to overcome, the potential benefits for research, social policy and investment from having enduring longitudinal datasets are profound. In terms of education statistics, the challenge for countries is to assess their statistical needs and how data can be better used to inform the pathways and outcomes of people's education over time. The Scottish Government, as one example, has highlighted data integration and linkage as an area of importance for the future of education statistics, with recent projects focusing on the analysis of participation in higher education and the destinations of school leavers. Continued development and sharing of data methodologies between countries involved in these types of activities will help increase the pool of knowledge and experience necessary for the expansion of data integration and linkage in the treatment and reporting of educational information.

### **D. The role of administrative data in official statistics**

42. In addition to the development of indicators and the classifications and standards of data, greater emphasis needs to be given at the international level to establishing the role of

administrative data in education statistics, in particular, the potential benefits of using it to supplement survey data.

43. While entirely replacing surveys with administrative data would likely result in less detailed information being available, using administrative sources in conjunction with survey data could assist with longitudinal analysis, while reducing burden on respondents to provide information which they may have already given on a prior occasion (such as on school enrolment forms or government subsidised medical benefit records). Administrative data could provide a wealth of information on which to create longitudinal datasets from information linked to education for building knowledge and informing policy. More effective utilisation of data sources would also reduce the duplication of work done by administrative data collectors and statistical agencies

44. While there are significant advantages in using administrative data, there are also challenges associated with access to and adaptation of the datasets. Data collected to facilitate the administration of government programs may have a number of limitations, particularly if its original intention has a narrow focus. In each case, analysis to determine whether or not administrative data are fit for wider statistical purposes needs to be undertaken. Other issues include convincing data custodians to supply their data to statistical organizations for these purposes and for statistical organizations to use the administrative data consistently and effectively. Some countries will already have experience in combining administrative and survey data whereas others may need to establish mechanisms for transition to more efficient ways of utilising alternative data sources.

## **E. Statistics on educational facilities and progress**

45. The OECD is currently playing a lead role in a global paradigm shift which recognises the need for more comprehensive measures of social progress beyond the currently accepted economic methods, such as the use of gross domestic product per capita as a measure of welfare. Part of this shift is a change in the type of statistics that are being produced in the area of education.

46. In addition to focusing on the outcomes of education, there is now a growing interest in the international community about the quality of educational institutions, modes of delivery and teaching staff. While the majority of the studies mentioned in recent work programs focus on tertiary institutions, studies by the OECD and UNESCO also point to the need for a closer examination of the training all teachers receive and the need for countries to support policy initiatives which attract, train and retain teachers who are effective and interested in their work.

47. Other issues pertaining to statistics on educational institutions are the environmental conditions in which people, particularly children, are learning and how this may impact on the quality of the education received. This could prove informative from the perspective of both developing and developed countries. The OECD has begun conducting work in this area via the CELE. Emphasis of the CELE is on the architecture of school buildings, but also on educational spaces more generally.

48. The challenge for the international statistical community will be to promote the implementation of these kinds of studies at the national level so that greater depth of knowledge on the progress of educational institutions and learning standards can be achieved within countries as well as between them.

## **F. Measurement of e-learning**

49. With growing interest in socially inclusive education and the demands of mobile or working students in an increasingly technological world, the proliferation of e-learning is an emerging area which the statistical community needs to give greater priority. Eurostat's goals for increasing quality, inclusivity and international accessibility of education speak directly to this issue. However, with such grand policy initiatives come difficult issues in statistical measurement.

50. Debates continue to evolve around exactly what e-learning is and how it should be measured. Key issues include:

- (a) How to determine the place of attainment of qualifications which were obtained in one country from an overseas institution, via the internet;
- (b) How to distinguish virtual from physical education institutions; and
- (c) How to compare the quality and accreditation of online studies with other qualifications.

51. These issues need to be clarified through international forums so that official statistics on attainment can accurately reflect current levels of education in the community and so that data are consistent and comparable between countries. The issue of double counting particular qualifications due to uncertainty over place of attainment also needs to be addressed.

## **G. Responding to changes in early childhood education**

52. Greater emphasis on education pathways and trajectories has given new impetus to not only ensuring that a greater number of people receive pre-school education, but also that processes surrounding these activities are documented accurately and consistently, both within and between countries.

53. The changes to the ISCED level 0 in the 2011 revisions reflect these trends resulting from the global proliferation of early childhood education programs. The new ISCED level 0 now extends beyond pre-primary education (coded as 0.2) to include early childhood development programs for children under 3 years of age (coded as 0.1).

54. Methods of distinguishing these from other types of programs, which may be either ISCED level 1 or care-based, may prove problematic as countries adjust to the new classification scheme. Differences in the nature of education systems (compulsory versus non-compulsory) and the age of attendees at particular institutions also make effective and fair comparisons difficult to establish, both within and between countries.

55. Further dialogue around new international classifications of early childhood education is essential to ensuring that the rich information that can be obtained from early childhood can be properly realised and effectively used and compared between nations.

## **H. Consistency and comparability in international statistics**

56. In all the issues and challenges discussed, the continued need for consistency in data standards, classifications and emphasis in collection is paramount for education statistics to be internationally comparable. Continued collaboration and dialogue between organizations will help ensure that concerns over measurement and definitions are openly discussed and that there is a shared sense of awareness of the major issues facing education statistics in the years to come.

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## VI. Directions for future development

57. In conclusion, the following issues may require further development by the international statistical community:

(a) Continued conceptual development across all areas of education is important for ensuring consistency in definitions and standards across sectors. Areas for particular emphasis include the revision of the measurement and classification of human capital, social inclusion, e-learning and early childhood education;

(b) Linking education data to other datasets to build a bigger picture of education pathways and transitions need to be advanced through continued sharing of best practice of data linking methodologies, sources of data linkage, and the quality of linking and the research produced from linked datasets;

(c) To compliment international studies, national statistical bodies could consider giving a higher priority to producing information on local educational facilities and the number and quality of available courses and teaching staff. This information could be useful across all stages of learning, from early childhood education and care through to vocational, higher education and on the job training. It could also assist in measures of quality and progress in education;

(d) Statistical bodies should be making use of administrative data and gauge public attitudes towards its use for purpose. An evaluation of the costs and benefits of reducing survey operations, both environmental and economic, would also help inform the operation of future survey programs;

(e) Most importantly, the international community must continue to collaborate and discuss major issues affecting the collection and reporting of education statistics. This will help identify gaps and inconsistencies between national collections and give rise to new methods and strategies for development.

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