

**For Official Use**

**EDU/INES/TALIS(2010)3**



Organisation de Coopération et de Développement Économiques  
Organisation for Economic Co-operation and Development

**English - Or. English**

**DIRECTORATE FOR EDUCATION  
EDUCATION POLICY COMMITTEE**

**EDU/INES/TALIS(2010)3  
For Official Use**

**Board of Participating Countries of the Teaching and Learning International Survey**

**The 8th Meeting of the Board of Participating Countries (BPC) of TALIS**

**LINKING TALIS TO STUDENT LEARNING OUTCOMES**

**25-26 February 2010  
OECD Headquarters, Paris, France**

Mr Michael Davidson: + 33 1 45 24 92 25 ; michael.davidson@oecd.org  
Secretariat: + 33 1 45 24 18 72 ; isabelle.moulherat@oecd.org

**English - Or. English**

Document complet disponible sur OLIS dans son format d'origine  
Complete document available on OLIS in its original format

## LINKING TALIS TO STUDENT LEARNING OUTCOMES

### Introduction

1. Throughout the development of TALIS a recurring issue is the value that would be gained from linking TALIS data to PISA or other student learning outcomes. Indeed, the original conception of TALIS anticipated growing synergies over time between TALIS and PISA but as noted at the 7<sup>th</sup> meeting of the TALIS Board of Participating Countries, other outcome measures could also be considered. This paper elaborates on what could be analytically gained from a closer connection between TALIS and PISA, drawing on country experiences in connecting data from the first round of TALIS with national student outcome measures. It then proposes how the next round of TALIS could connect with PISA 2012, giving consideration to sampling and operational issues. Such a connection would be offered as an option in the second round of TALIS.

2. The TALIS BPC is asked to:

- **DISCUSS** the country experiences of connecting TALIS with student outcome data;
- **REVIEW** and **COMMENT** on the potential analytical benefits that could arise from connecting TALIS with PISA 2012;
- **REVIEW** and **COMMENT** on the operational considerations of connecting TALIS with PISA 2012 noted in the paper; and **ADVISE** on additional operational issues that would need to be addressed.

### What can be gained from having student outcome measures in TALIS

3. In fact, this question has been the subject of much discussion already, for instance in the paper discussed at the 7<sup>th</sup> meeting of the TALIS BPC in October 2009 [doc.ref. EDU/INES/TALIS(2009)4]. More recently, the ACER-led consortium for PISA 2012 has considered options for connecting PISA 2012 with the next round of TALIS [doc. ref. EDU/PISA/GB(2009)28]. Furthermore, the two expert reviews (by Dr. Jurgen Baumert and Dr. Eckhard Klieme) that were commissioned into the question of what could and could not be gained from linking PISA with TALIS are also still very relevant [doc. ref. EDU/EC/CERI(2004)5].

4. The following attempts to summarise the key points from these papers and the discussions around them concerning what could be gained from a connection of TALIS to PISA.

5. Essentially the benefits of the connection would be two-fold:

- **A greater understanding of the variation in teacher attitudes beliefs and practices** - the student background and student performance information from PISA would provide important context for analysing and understanding the teacher responses in TALIS e.g. how does the use of different instructional practices vary between high and low performing schools or schools facing more or less challenging circumstances?

- **A greater understanding of the variation in student outcomes** - teacher information such as that collected through TALIS can improve the measurement of the instructional environment in schools and enhance the explanatory power within PISA- both in terms of school performance and also of the attitudes of students e.g. are certain teaching practices associated with higher levels of student achievement, motivation or engagement in learning?

6. In more detail, **at the school level** the connection would allow analysis to:

- Provide a more complete description of the learning environment experienced in the schools of 15-year-old students (i.e. PISA schools) and allow this to be compared within and between countries (variables measured would for instance be teacher-student relations, teacher support, disciplinary climate). This would, for instance, provide valuable insights into how the learning experience at age 15 relates to students' motivation and attitudes to learning and hence how well it prepares these students for lifelong learning.
- Examine the relationship between the instructional environment, including instructional practices, experienced in the schools of 15-year-old students and PISA outcomes at the school level. Such school effects that are detected will be a mixture of school, class and teacher characteristics. The proportion of variance explained may not be large.
- Examine the relationship between the instructional environment in the schools of 15-year-olds and other school level factors such as the profile of the 15-year-old student population. For example, how is the instructional environment that is encountered by 15-year-olds in PISA schools related to the social/ethnic mix of the students? How does the instructional environment relate to student engagement and participation?
- Strengthen and add to the existing PISA school level variables on school practices, school climate, professional climate, parental involvement, school leadership. This may require some reorganisation of questionnaire items between the student, principal and teacher questionnaires to target questions to those who are best equipped to answer them. In doing so the explanatory power of PISA at the school level would be increased.

7. **Classroom level** analysis would be possible if a sufficient number of countries choose to undertake grade-based sampling with intact classrooms in PISA 2012. This would allow teacher questionnaire data to be matched directly to the student data at the classroom level. The purpose of the teacher questionnaire would be to provide data on teacher characteristics and teacher reports on instructional practices in the target classes, allowing for multilevel-analysis of relationships between teaching and learning by incorporating a classroom or grade level within the models. Student and teacher perspectives could be used to triangulate information on the classroom learning environment.

8. To realise these benefits (drawing on the proposals in doc.ref. EDU/PISA/GB(2009)28), a range of domain-general variables and constructs describing the learning environment would be collected. These may include school climate; leadership; parental involvement; evaluation; assessment; strength and profile of shared achievement orientations; teacher collaboration; policies with regard to accountability, evaluation and assessment; information on failing students; incidences of remedial and extension education as well as other additional activities. Some of which were of course collected in the first round of TALIS.

9. To gain most from the link with PISA 2012 where mathematics is the major domain, mathematics teachers could be oversampled to allow comparisons specifically with student performance in mathematics. Moreover, alongside the domain-general variables and constructs, a module of questions

targeted specifically at mathematics teachers could examine domain-specific variables such as classroom instructional practices, beliefs about mathematic teaching and mathematics curriculum.

10. Some **longitudinal information** may also be gained. PISA 2012 is considering a longitudinal design component by linking the PISA 2012 school sample to the PISA 2003 school sample, when mathematics was also the major domain. Although a teacher questionnaire was not administered in PISA 2003, the TALIS questionnaires could ask about changes in policies and practices over the period to assess what relationship they may have had with changes in the school's performance, which the longitudinal design of the PISA sample would allow.

### **Country experiences**

11. To move from the theory to the practice, it is helpful to consider the experiences of countries who have already linked TALIS to student outcomes. Both Iceland and Mexico have combined data from the first round of TALIS with national student assessment data and they will present the results at the meeting.

#### *Iceland*

12. Analysis conducted by the Educational Testing Institute in Iceland examined the relationship – at the school level- between TALIS variables from both the teacher and school principal questionnaires and student performance (grades) in Icelandic and mathematics in the Icelandic National Tests for 10<sup>th</sup> grade students. Annex A summarises the preliminary findings. These revealed significant relationships between TALIS variables and student achievement that can be very useful in a further analysis and interpretation of the TALIS data. This includes the finding that there is a positive relationship between the educational level of teachers and student performance.

#### *Mexico*

13. Mexico has carried out an analysis that sought to evaluate the relations between school level variables in TALIS and the results from ENLACE, the national student assessment in Spanish, mathematics and science for students in the 3<sup>rd</sup> grade of secondary school. Linkages were at the school level rather than the student-teacher level. Annex B presents a summary of the key results. Among the interesting results is the finding that although stronger constructivist beliefs about teaching are associated with higher student achievement, student-oriented practices are associated with lower levels of student achievement.

#### *Norway*

14. Norway is also planning to carry out similar analysis. For every school in TALIS, the average score based on final exams in Norwegian, mathematics and English will be calculated, as will an average measure of parental background (educational level). Then a set of school factors from TALIS will be calculated (e.g. teachers' formal education, age profile, teachers' further education, school management and leadership, feedback, beliefs and practices, school climate). The relationship of these with the final exam results will then be analysed at the school level. One possible focus of the analysis could be the characteristics of high performing and low performing schools.

### **Considerations in linking TALIS with PISA 2012**

#### *Aim*

15. So, to recap the discussion above, the aim of the PISA-TALIS link would be to provide the opportunity to examine associations between teacher and school professional practices with student

outcomes (e.g. how does the profile of students in school influence how teachers work?) and to provide more reliable information on the school level learning environment in PISA.

16. In terms of analysis, it is assumed that countries will want to compare the responses of primary and secondary teachers from the broader TALIS sample and with teachers in the schools of 15- year-olds in PISA schools, with the added benefit of the PISA student information.

### *Co-ordination with PISA 2012*

17. PISA 2012 has provisions for the development of an option to link PISA with TALIS. This involves the PISA 2012 contractor determining sampling procedures to facilitate the link and working with countries who wish to pursue such a link to achieve the appropriate sampling strategies. In addition, the PISA Governing Board meeting in Istanbul on 2-4 November 2009 considered proposals for a separate teacher questionnaire within PISA (independent of TALIS) [doc. ref. EDU/PISA/GB(2009)28]. This would be an international option if sufficient countries wanted to take it up. In discussion the PISA Governing Board underlined that the development and implementation of the teacher questionnaire would require close co-ordination with the second round of TALIS, **which would become the primary vehicle for data collection**. Further to this, based on indications so far from PISA countries, there appears to be insufficient interest to justify a separate teacher questionnaire in PISA. The discussion in this paper therefore follows the assumption that it would be through the TALIS-PISA link option in the second round of TALIS that a teacher questionnaire will be administered in PISA 2012 schools.

18.

19. Clearly, the sampling becomes easier the more overlap there is between the TALIS school sample and the PISA school sample. The choice of target population for TALIS is discussed in EDU/INES/TALIS(2010)x and sets out the case for a target population of ISCED level 1 to 3. If this is accepted, then the PISA population of schools would in effect be a sub-set of the wider TALIS population of ISCED1-3 schools. Noting that the TALIS sample and the PISA samples would be drawn at different times (because of the scheduling of the field work), then the following sampling strategy could be applied:

- The TALIS sample would be selected to meet the needs of TALIS for data on primary and secondary teachers.
- The PISA school sample would be drawn to meet PISA requirements.
- The overlap of the two school samples would be maximised – this would have to be undertaken by whichever contractor- PISA or TALIS - selected the sample second (this could vary by country).
- In schools selected for PISA that were not selected for TALIS, a teacher sample would be selected and the TALIS teacher questionnaire would be administered to them.
- A consolidated TALIS dataset could be constructed including all of the TALIS data from both samples.

20. As discussed above, the teacher sample in all selected schools – both PISA-link schools and other TALSI schools - could over-sample mathematics teachers, given the mathematics focus in PISA2012 and could have a module of questions specifically on mathematics teaching practices targeted at mathematics teachers.

### ***Scheduling***

21. Ideally, TALIS should be conducted in the PISA 2012 schools in the same school year that the PISA 2012 assessments take place. Survey windows for PISA 2012 are likely to be around April 2012 for northern hemisphere countries and around August 2012 for southern hemisphere countries, though there are some exceptions to this.

22. The current plans for the second round of TALIS have the fieldwork for the main survey scheduled for October-December 2012 for southern hemisphere countries and March-May 2013 for northern hemisphere countries. It is evident therefore that on current plans, the ideal of having PISA and TALIS conducted in the same school year could only be achieved for some countries. For northern hemisphere countries in particular (with a few exceptions), TALIS would have to go back to the PISA 2012 schools up to one year after the PISA assessments had taken place. If the focus of the PISA-TALIS link is on the teaching and learning environment at the school level then it is reasonable to assume that the school environment will not have changed significantly over the space of year, even with some teacher mobility. Control questions could be added to enquire about this.

### ***Synergies between TALIS and PISA background questionnaires***

23. To properly capitalise on the PISA-TALIS link, it will be necessary to align some constructs between the PISA school and student background questionnaires and the TALIS teacher and school principal questionnaires. Also, the extent to which school principals are asked to complete two questionnaires should be kept to an absolute minimum. As noted earlier, this alignment of questionnaires between TALIS and PISA may require some reorganisation of questionnaire items between the student, principal and teacher questionnaires to target questions to those who are best equipped to answer them. Close coordination with the PISA 2012 consortia will therefore be necessary to achieve this.

## ANNEX A: ICELAND STUDY:

### Relationship between TALIS variables and grades on National Tests in the 10th grade: A preliminary summary.

Ragnar F. Ólafsson and Júlíus K. Björnsson  
Educational Testing Institute, Reykjavík  
February 2010.

#### Analysis methods:

For the TALIS-Principal's Questionnaire, correlations were computed between test performance in Icelandic and Mathematics in the tenth grade from spring 2008 and the principal's responses on the questionnaire. For the TALIS-Teacher Questionnaire, the average response for each school was first computed, thus giving one figure for each school on each question. Correlations (Spearman) and ANOVA's were then computed, examining relationships between teachers' responses on TALIS and achievement in the schools. For the ANOVAS, schools were divided into 3 groups based on math achievement in 2008: Low, medium and high achievement schools. Some of the significant ANOVAS and Correlations ( $p < 0,05$ ) are reported below. Note that these are very preliminary results only intended to underline the fact that there are significant relationships between TALIS and achievement that can be very useful in a further analysis and interpretation of the TALIS data.

**Teacher education:** There is a positive relationship between the educational level of teachers and performance. Shortage of adequately qualified teachers is also associated with lower achievement. Also, the estimated educational level of parents is related positively to achievement on the national tests. Teacher participation in research projects is accorded higher value (as improving teaching ability) in schools with high performance average.

**Size of school:** Various measures of size indicate that larger schools (larger communities, a higher number of teachers, larger classes) relate positively to higher performance.

**Age of principal** is positively associated with performance. Also, a longer teaching career of teachers is associated with higher performance.

**Class-room atmosphere:** Bullying, class disturbance and teacher absenteeism are related to lower performance. Teacher assessments of how well teachers and pupils get along, are associated with higher performance on the tests.

**Professional development and feedback.** If the principal sees it as an important part of his assessment of the teachers to identify specific needs for professional development at an individual level, this is associated with higher achievement. From the point of view of the teacher, expressed need for more professional development and the need to take part in more training were however associated with worse performance. Perhaps counter-intuitively as well, if teachers felt that feedback was useful, this was related to lower performance. Also, if feedback led to a lot of changes in how teachers went about their work (e.g. in relation to their knowledge of their main teaching area, how they tackled behaviour problems in class and how they taught in multicultural settings) this was associated with lower achievement.

**Beliefs** in a couple of "Constructivist" statements about teaching was highest in schools with medium grades, indicating that extremes are to be avoided with respect to teaching philosophies. Asking pupils questions about their understanding of the topic happened most frequently in the high performing schools.

**Activities of the Principal.** If the principal keeps track of student learning outcomes when preparing curriculum and teaching aims, this is related to higher performance. Also, if the principal is able to spend time on the curriculum and various teaching related tasks (and not only on bureaucratic activities), this is also related to higher performance. However, lower achievement occurs when much of the principal's time is spent checking whether mistakes are made by others in reports and activities.

Perhaps counter-intuitively again, lower performance is associated with instances where the principal suggests to teachers how they can improve their teaching. This may be in response to perceived deficiencies in teaching methods. A number of other questions reflect such counter-intuitive relationships, i.e. where a seemingly constructive activity of the principal is associated with a negative performance outcome. These include tackling

problems in school, making sure the activities of certain teachers are monitored more often, receiving external school assessment reports etc. These instances probably mean that these activities are a reaction to various perceived deficiencies in the running of the school, not that they are causing low performance. Similarly, if the teacher spent much time on work with individual pupils, this was associated with lower grades.

The table below summarizes the main variables that are positively and negatively associated with performance on the national tests.

<b><i>Variables associated with higher grades:</i></b>
Educational level of Teacher
Educational level of parents
Teacher participation in research
School size
Age of principal
Length of teaching career
Number of teachers in school
Size of community
Class size
Teacher evaluation that relations with students are important
Principal putting emphasis of professional development of teachers
Teacher explicitly askin students about their understanding of their subject
Principal keeps track of student grades when preparing curriculum and teaching aims
<b><i>Variables associated with lower grades:</i></b>
Principal most concerned with checking for mistakes by others
Principal suggests frequently how teaching can be improved
Shortage of qualified teachers
Teacher expressed need for professional development
Teacher need to take part in more training
Bullying
Class disturbances
Teacher absenteeism

**ANNEX B: MEXICO CASE STUDY**

[to follow]