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**DIRECTORATE FOR EDUCATION
PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT**

Governing Board

ANALYSIS AND REPORTING PLAN FOR THE PISA 2006 ASSESSMENT

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ANALYSIS AND REPORTING PLAN FOR THE PISA 2006 ASSESSMENT

1. In July 2007, the PISA Governing Board received a first draft of the analysis and reporting plan for the PISA 2006 assessment. This plan provided options for how the policy priorities that the PISA Governing Board had established at the outset of the PISA 2006 survey [doc. ref. **EDU/PISA/GB(2006)10**] could translate into various analytical outputs and reports. Australia, Austria, Belgium, France, Germany, New Zealand, Switzerland, the United Kingdom (Scotland) and Macao-China provided comments on this draft which are summarised in the annex and which have been taken into account in the revised draft analysis and reporting plan for the period 2008 to 2010 that is presented in this document. The document also relates the proposed analytic outputs to the four themes in the medium-term strategy guiding the OECD work on education for the years 2009 and 2009 that is currently under discussion by the Education Policy Committee (1. raising teaching and learning effectiveness, 2. closing the skills gap, 3. raising quality and relevance of higher education and 4. promoting social mobility and inclusive education, for details see doc.ref. **EDU/EDPC(2007)13**).

2. The PISA Governing Board is asked to:

- **PROVIDE DIRECTIONS** for the finalisation of the analysis and reporting plan.
- **FINALISE** the work programme for 2008 as far as the analysis and reporting plan is concerned.

Analysis and reporting plan for the period 2008 to 2010

3. In the following, outputs are classified into three categories: *i*) in-depth thematic analyses that require significant efforts in terms of analysis and research – and therefore time and money; *ii*) working papers and policy briefs that mainly involve the utilisation of existing data and analyses – and which have therefore fewer resource implications; and *iii*) methodological and technical reports, which are needed at both national and international levels to support further analysis of the PISA data.

In-depth thematic analyses

Against the odds – Overcoming the impact of social disadvantage on educational outcomes

4. This report relates to theme 4 identified in the draft OECD medium-term strategy, *promoting social mobility and inclusive education*.

Aim

5. The report seeks to:

- Summarise the research literature on the definition of social disadvantage and its impact on school outcomes, as well as the characteristics and social contexts of resilient students who beat the odds.

- Develop a conceptual and empirical measure of social disadvantage relative and relevant to the PISA 2006 countries examined in this study.
- Examine the personal characteristics of socially disadvantaged students who succeed in school and highlight the social and educational contexts that set them apart from their less successful peers.

Rationale and policy relevance

6. Educating children and youth so that they are able to meet the challenges of today's knowledge societies and become informed citizens is a global imperative and improving the success of all students is necessary to meet the growing demands of the dynamic global economy. All too often, researchers, media, business leaders, and politicians focus on the shortcomings of education systems and the academic failures of the most vulnerable populations. Many children around the world are struggling to go to and stay in school, as well as to master basic literacy and numeracy skills. These same students often face very challenging social conditions that impede their learning, creating an unquestionable link between social status and academic success. However, many students are able to overcome their personal challenges and become successful in school and life. Studying these students – those who have beaten the odds and are succeeding in school – will reveal much about the characteristics and contexts that can make a difference in the lives of vulnerable populations. It will also aid countries in identifying those factors and conditions that could help more students succeed despite the challenges facing them.

Data sources and analysis

7. A majority of the analysis will be descriptive – defining relative social disadvantage and exploring the personal and school characteristics of different types of students. Specifically, the report will measure social disadvantage using indicators of students' social characteristics (e.g. single parent household, foreign born, low socio-economic status) and will draw on the student and parent questionnaires from PISA 2006. Because the PISA 2006 data focuses on science achievement, school success will be measured using the PISA 2006 science assessment scores. Students' personal characteristics will include demographic data, measures of motivation, aspiration, school participation and engagement, again drawing on student questionnaires. School experiences and context will include details regarding school policies and structure, peer environment and school support systems, drawing on school questionnaires. However, the report will also seek to statistical analyses to determine variations across countries and schools in the experiences and outcomes of disadvantaged students and for this will draw on PISA 2006 data.

Preliminary outline

8. A thematic report on this focus area could be structured as follows:
- *Introduction.* This chapter would define social disadvantage and its impact on education outcomes based on past relevant literature and research. How do definitions of disadvantage and success vary across the countries who participated in PISA 2006? How might these differences be accounted for? How might the various relevant populations in each of the countries be described? The chapter should also include a review of the literature on resiliency, providing information about the characteristics and conditions of students who have beaten the odds.
 - *Defining social disadvantage in the international arena.* This chapter would begin with a review of research on social disadvantage and develop empirical measures of social disadvantage relative to and relevant for each PISA 2006 participating country. What do socially

disadvantaged students look like compared to advantaged students, according to indicators such as single-parent household, foreign-born, low socio-economic status? The chapter will show this through the outcomes of simple hierarchical linear modelling, in order to determine the variation in at-risk populations among different PISA 2006 participating countries and schools within those countries.

- *Who beats the odds?* This chapter would present a descriptive picture of students who have beaten the odds to succeed academically. It should identify two groups of socially disadvantaged students: those who have been relatively successful in school and those who are struggling in school. Academic success will be defined through exceptional scores on the PISA 2006 science assessment, relative to their socio-economic background. What are the personal characteristics of the socially disadvantaged but successful students? Of their less successful peers? What variation is there in surveyed measures of motivation and aspirations among the students? How do students who beat the odds compare to other, less socially disadvantaged, students? To what extent is achievement in each PISA 2006 subject (science, mathematics and reading) related to achievement in the other two subjects? By examining all three subjects, the chapter should paint a more complete picture of the student who has beaten the odds.
- *Students who beat the odds and their school experiences.* Using the PISA 2006 questionnaire responses of students identified as at risk, as well as the questionnaires completed by their parents and school principals, this chapter should examine the school-level factors that affect the experiences of at-risk students and the degree to which these experiences are related to academic success and struggle. It should look at school experiences through three different lenses:
 - School policies and structure – including variables related to school size, resources and available programmes
 - Peer environment – including variables related to aggregate engagement, motivation and socio-economic status
 - School quality – including variables regarding teacher qualifications, parental perceptions of school quality and accountability measures

These will be based on available PISA 2006 survey variables and will provide descriptive views of each of the dimensions for both successful and unsuccessful disadvantaged students. Furthermore, they will determine the extent to which these school experiences are associated with academic outcomes and result in success against the odds. It should present findings related to school experiences separately for different at-risk populations and within different economic and social contexts.

- *Implications for policy and practice.* This chapter would report descriptive conclusions from the study and synthesize the findings into a set of potential policy recommendations for PISA 2006 participating countries concerning identifying and supporting at-risk students, increasing their success rates, and promoting the expansion of human capital.

Resource implications

9. The cost of the report would be EUR 175 250:

	TOTAL	Of which: 2008 payments
External contractors and experts	EUR 115 000	EUR 50 000
OECD staff costs	EUR 30 250	EUR 11 000
Technical review	EUR 5 000	EUR 2 500
Layout and production	EUR 25 000	
Total	EUR 175 250	

The teaching and learning of science

10. This in-depth analysis covers theme 1 of the draft OECD medium-term strategy, namely *raising teaching and learning effectiveness*.

Aim

11. The aim of this report will be to describe differences in the environment and approaches to learning and teaching of science, as reported by students and school principals, across educational systems and to inform the development of policies and practices aimed at increasing the effectiveness of teaching and learning science.

Rationale and policy relevance

12. The teaching and learning of science represents a proximal condition for the development of scientific competencies, relating to both students' conceptual and procedural understanding of science and their attitudes towards science and related issues.

13. An understanding of science and technology, as well as positive attitudes towards science, are essential to a young person's preparedness for life today. Being scientifically literate contributes to being empowered for participation in a society that is strongly influenced by science and technology.

14. Science teaching can provide a learning environment in which young people have the opportunity to systematically engage in science activities and to develop scientific literacy.

15. The report seeks to address the following policy questions:

- Country level
 - *Cultural patterns of science teaching and differences between countries with regard to these styles.* How much do countries vary in their approaches to science learning, as reflected in the accounts from students and school principals? Are there culturally shared patterns of science teaching with regard to school as a source of science knowledge, interactive teaching, and the nature of science?
 - *Interrelations between areas of science teaching and learning* Is interactive science teaching related to the nature of science in teaching? Does this have an effect on the students' use of

learning opportunities within school settings? How do countries differ with respect to these interrelations?

- *Science learning patterns.* Are students in countries with certain approaches to science learning more likely to develop a positive attitude towards science? Do they show a better knowledge of and about science? Are they more likely to develop positive attitudes towards science if learning is oriented towards interactive elements and towards authentic and real-life applications of science? Do inquiry and scientific investigations lead to a better understanding of science, in the sense of scientific knowledge and knowledge about science?
- School level
 - *School type or school-specific patterns of science teaching.* Are there systematic differences in science learning approaches between different types of schools (which may be intended in tracked school systems) or different locations of schools?
 - *The relationship of school-specific science learning approaches to other school level variables* Are specific patterns in science learning related to school profiles, equipment or science-related activities at school?
 - *The relationship between specific patterns of science learning to the composition of the school population (science engagement, socio-economic status)* To what extent can such relationships be mapped?
 - *School-specific learning patterns* What impact does a school's orientation to science learning have on the students' scientific literacy?
- Individual level
 - *The compensatory effects of science learning on student achievement* Does science teaching play a compensatory role for low students from disadvantaged socio-economic backgrounds in providing opportunities to encounter science-related issues and to systematically learn science? Does interactive science teaching with a focus on the nature of science provide manifold learning opportunities for students with high and low pre-requisites (such as socio-economic status, parental involvement, gender, etc.)? How do high and low pre-requisite students perceive science teaching and learning at their school?

Data sources and analysis

16. Data for exploring the potential policy issues were collected through student, parent and school questionnaires.

- Items were included in the student questionnaire to measure the following constructs related to the teaching of science at school (each of these constructs is measured using Likert-type items):
 - Interactive teaching of science
 - Science teaching using hands-on activities
 - Science teaching through student investigations

- Science teaching using models or applications
- In addition, the student questionnaire provides the following contextual information for science teaching and learning:
 - Schools as a source of science information
 - Science course taking (current year, previous year)
 - Attendance of out-of-school time lessons
 - Learning time at school
- In addition to basic school data (school type, school size, staff-teacher ratios etc), the school questionnaire provides information on the following contextual aspects:
 - Preparedness of schools to teach science (teaching staff, laboratories)
 - School activities to promote science learning

17. It is well known that there are large differences in the way science is taught at schools in participating countries; in many countries science is taught in different subjects (biology, chemistry, physics, earth science), while in others science topics are taught in general science courses (often until the end of lower secondary). In order to provide information about the context for science teaching, it is proposed to develop a special survey that will collect country-level data on science curricula and policies regarding the instruction on science in participating countries. Such a survey would be organised in close co-operation with the PISA Governing Board and the OECD Secretariat.

18. For countries participating also in the OECD Teaching and Learning International Survey (TALIS), the feasibility of linking the data from PISA and TALIS will be explored. If a methodologically sound link between the surveys can be established, TALIS will provide a wealth of additional contextual data which could be used at the country level in order to contrast teacher reports on science teaching methods with students' perceptions. In addition, the teacher survey might provide data on the professional backgrounds of teachers in order to inform the description of the context for science teaching in countries.

19. In PISA 2006, between 10 and 15 countries will be collecting data from grade-based samples in addition to the age-based PISA sample. This will provide the opportunity for adding a supplementary analytical perspective. In view of the range of grades assessed in many countries and the diversity of science teaching across grades and study programmes, data from grade-based samples could supplement the information on science teaching and learning in a number of countries.

Preliminary outline

20. A thematic report on this focus area could be structured as follows:

- *Introduction.* This chapter will provide the conceptual framework for the assessment of science teaching and learning. It should also provide a theoretical perspective regarding the different approaches to science instruction.
- *Context for science learning.* This chapter will describe how science is taught in participating countries, using data from the student questionnaire on course taking and information collected

through a special country-level survey. The specific structure of educational systems should be emphasised, describing the way the countries' science curricula are implemented (centralised versus decentralised).

- *Profiles of science teaching across countries.* This chapter will focus on describing patterns of science teaching styles across countries. The data would mainly be provided by student questionnaires, however, these results could be contrasted with teacher reports (where available from TALIS). Data from grade-based samples could be contrasted with those from the age-based samples in a subgroup of countries.
- *Science teaching styles and learning outcomes.* This chapter will explore the relationship between teaching styles and learning outcomes. It should not only look at student performance in science, but also at key indicators of student engagement (interest, self-cognitions). Relationships should be explored at different levels (students, schools, countries) and controlled for gender, student background variables and school-related factors. In addition, it may look at student and parent questionnaire data regarding perceptions about the effectiveness of science teaching in preparing for science-related careers.
- *Science teaching and the structure of educational systems* This chapter will examine how science teaching is affected by the way educational systems are organised. Vocational and pre-vocational study programmes (or programmes, which lead to upper secondary education, or not, as in the case of Germany) are likely to differ from general ones in their approach to science teaching. Furthermore, there are possible variations at the school-level depending on the degree of curricular autonomy, which could be explored.
- *Implications for policy and practice* This chapter will summarise the findings and discuss their implications for policy makers and science educators.

Resource implications

The cost of the report would be EUR 160 000 in total, of which EUR 100 000 is already budgeted for:

	TOTAL	Of which: 2008 payments
External contractors and experts	EUR 0 – already covered in the existing PISA contract	
OECD staff costs	EUR 30 000	EUR 10 000
Layout, production	EUR 30 000	
Technical review	EUR 2 500	EUR 2 500
Total	EUR 60 000	

Working papers and policy briefs

Gender differences in science attitudes, competencies and knowledge

22. This output covers theme 1 of the draft OECD medium-term strategy, namely *raising teaching and learning effectiveness*.

Aim

23. To produce a short, focused report on the gender differences observed in regards to science attitudes, competencies and knowledge in PISA 2006.

Rationale

24. PISA has revealed striking discrepancies for the results of males and females – in reading in 2000, females significantly outscored males in all countries, while in 2003 males outscored females somewhat in mathematics; in 2006 on the combined science scales there were a small number of differences observed. However, when examining the different subscales, different knowledge components and attitudes to science there are some marked differences. Knowledge obtained will inform approaches to the organisation and teaching of science. The target audiences for this policy brief are policy makers, educational administrators, teachers, parents.

Policy questions

25. The report seeks to address the following policy questions:

- In which areas of science (knowledge and competencies) are significant gender differences observed?
- Are differences in attitude related to the differences in knowledge and competencies?
- Are the attitudes of parents related to the attitudes and outcomes of males and females?
- What is the relationship between home background and the observed gender differences?
- Is there any evidence that gender differences are influenced by the organisation of science teaching?

Data sources

26. There are four main sources of data available for this policy brief:

- Performance data on the different PISA 2006 science subscales
- Data from the embedded attitude items used in PISA 2006
- The PISA 2006 student questionnaire
- The PISA 2006 parent questionnaire

Preliminary outline

A policy brief on this area could be structured as follows:

- *Introduction.* The section should give an overview, by gender, of student performance in PISA. What has been observed in PISA in previous cycles in terms of gender? How was information on gender in PISA 2006? What countries participated in PISA 2006? What countries used the PISA 2006 parent questionnaire? It should also present structure of the report.
- *The PISA 2006 science subscales.* The section should examine what gender differences can be observed in the science subscales. What is the relationship between attitudes to science and performance on the subscales?
- *Home background.* The section should look at the relationship between home background, attitudes, gender and performance.
- *An examination of students' self efficacy, attitudes to science and performance*

Resource implications

27. The cost of this policy brief would be EUR 35 000:

External contractors and experts	EUR 7 500
OECD staff costs	EUR 17 500
Technical review	EUR 2 500
Layout, production	EUR 7 500
TOTAL (all payments in 2008)	EUR 35 000

Excellence in education: characteristics of the best performing students in PISA

28. This in-depth analysis covers theme 1 of the draft OECD medium-term strategy, namely *raising teaching and learning effectiveness*.

Aim

29. To examine the background characteristics, the attitudes and the aspirations of the high-achieving students in PISA 2006.

Rationale and policy questions

30. The PISA 2006 initial report shows that most students have a high level of support for science as a field of endeavour, but that few of them consider a career in science. Countries are very keen to attract capable and motivated students into careers in science in order to maintain and accelerate technological development. PISA 2006 data provide a unique opportunity to examine the characteristics of the best performing students around the world and to explore their attitudes to science and their aspirations for the future. The target audiences of this policy brief are education and economic policy makers, education administrators, and teachers.

31. The report seeks to address the following policy questions:

- *Top performers in PISA.* What can the top performing students do according to the PISA assessments and where are these students located?
- *Characteristics of high-achieving students.* Do these students come from a particular type of home background in terms of socioeconomic status, immigrant status and home language?
- *Attitudes of high-achieving students.* How do top performers view science and environment?
- *Career expectations of high-achieving students.* Do these students aspire to follow a career in science?

Data sources

32. The data for this policy brief are available from the PISA 2006 student and school database, and the PISA 2006 parent questionnaire.

Preliminary outline

33. A policy brief on this area could be structured as follows:

- *Introduction to PISA.* This section should describe the PISA programme, similar to the material covered in Ch. 1 of the upcoming PISA 2006 initial report (and most PISA publications). How is the test administered? What countries participate? Within countries, what is the sample? How data are collected? What data are collected? It should also define the high-achieving student.
- *Description of the home backgrounds of high-achieving students.* The section should describe the home backgrounds of these students.
- *Attitudes of high-achieving students and likelihood of future careers in science.* An examination of the attitudes of high-achieving students and their propensity to pursue a career in science.

Resource implications

34. The cost of this policy brief would be EUR 35 000:

External contractors and experts	EUR 7 500
OECD staff costs	EUR 17 500
Technical review	EUR 2 500
Layout, production	EUR 7 500
TOTAL (all payments in 2008)	EUR 35 000

Methodological and technical reports

35. These reports detail the stimulus material used in PISA, as well as the data collection and analysis processes followed in general, and thus do not relate directly to the substantial themes identified in the draft OECD medium-term strategy. Rather, they provide a basis for analysis in all of these areas.

The PISA 2006 Technical Report

Aim

36. To produce a report detailing the design, implementation and analysis of PISA 2006.

Rationale

37. PISA 2006 was the third administration of the PISA survey and had its main focus on science. 2006 saw an increase in the number of countries participating from 41 to 57. This report outlines the sampling issues, the test design, translation procedures, field operations, coding responses, scaling, data adjudication and proficiency scale construction. Of particular interest in the science assessment is the focus on measuring student attitudes to science, especially by using attitude questions embedded in the cognitive part of the test – the aim of this was to place the attitude questions into a particular context rather than simply asking for student attitudes in the student questionnaire. The target audiences for this report are education assessment researchers, policy makers and education administrators.

Preliminary outline

38. This report could be structured as follows:

- Introduction to PISA and its development, how the test is administered, what is the sample, how data are collected, what data are collected, participating countries.
- There will be chapters on test design, questionnaire development, sample design, translation procedures, field operations, quality monitoring, weighting, scaling, coding, data cleaning, data adjudication, proficiency scale construction and construction of the international database.

Resource implications

39. The supply of the final draft is part of the PISA 2006 contract. The cost of this report would be EUR 34,900.

External contractors and experts	0
OECD staff costs	21 900
Publications productions cost	13 000
TOTAL (all payments in 2008)	EUR 34 900

The PISA 2006 Data Analysis Manuals

Aim

41. To produce manuals to facilitate the analysis of PISA 2006 data.

Rationale

42. In 2005, the Secretariat produced data analysis manuals for analysis of the PISA 2003 data in two versions – one for users of SPSS and another for users of SAS. These manuals have found wide acceptance and have also been the basis for a number of data analysis workshops organised by the Secretariat. The

information and coding supplied in the 2003 manuals cannot be directly used for analysis of the PISA 2006 data with its focus on science and the inclusion of different items both in the cognitive tests and in the questionnaires – it will, therefore, be necessary to update the manuals. The target audience for these reports is education researchers.

Preliminary outline

43. This report could be structured as follows:

- *Introduction to PISA and its development.* How the test is administered? What is the sample? How data are collected? What data are collected? Which countries participate?
- Several chapters on test design, the items response models, plausible values, standard errors, proficiency levels, school level variables, trends and multilevel analyses.
- An annex will contain (in each version) the coding and macros necessary to carry out the analyses.

Resource implications (for both versions)

44. The cost of these two manuals would be EUR 88 200:

External contractors and experts	EUR 20 000
OECD staff costs	EUR 45 200
Publications productions cost	EUR 23 000
TOTAL (all payments in 2008)	EUR 88 200

Collected Items from PISA 2000, PISA 2003 and PISA 2006

Aim

45. To produce a report/workbook comprising all the publicly released items from PISA 2000, PISA 2003 and PISA 2006.

Rationale

46. There is a high level of popular interest in PISA in participating countries and others. In some countries, trade publishers, newspapers and television networks have even brought out their own PISA quizzes. These are often inaccurate in their representation of PISA and clearly show there is a demand for user-friendly, non-specialist PISA material. While the items have not been created as didactic tools, teachers, parents and students, in particular, will be interested to have a book that presents the test questions taken by students worldwide in each PISA assessment, along with the answers. The design and layout of the publication should be clean and simple, facilitating photocopying for classroom use. The publication would also include an overview of the PISA project, the aim and content of the PISA concept of literacy and a technical annex demonstrating how the test items fit into PISA's conceptual framework.

Sources

47. The publicly released items for PISA 2000, PISA 2003 and PISA 2006. The PISA 2000, PISA 2003 and PISA 2006 databases for complementary information on the items. The PISA 2000 and PISA 2003 initial reports for background information on PISA.

Preliminary outline

48. This report could be structured as follows:

- *Introduction.* Why the OECD member countries established PISA, description of the PISA surveys:
 - What does PISA test? A short overview of the PISA concept of literacy
 - How the PISA tests are developed and administered
 - How the results are released
 - What the results mean, what they can and cannot tell us

About this book, how to use the book:

- How the questions are presented
- How the answers are presented
- *Chapter 1: Reading items*
- *Chapter 2: Mathematics items*
- *Chapter 3: Science items*
- *Chapter 4: Problem-solving items*
- *Annex 1 Answers and context.* This annex presents the answers to the test questions, along with complementary information on each, including how well students did on the question
- *Annex 2 Technical information.* A basic introduction to the PISA proficiency scales, as well as mapping of the items to the scales and information on where to access the full frameworks and technical reports.
- Bibliography: PISA publications, related OECD publications

Resource implications

49. The Secretariat would develop, draft and produce the publication. The cost of the report would be EUR 55 000:

External contractors and experts	EUR 20 000
OECD staff costs	EUR 5 000
Layout, production	EUR 30 000
Total	EUR 55 000

Proposed work programme for 2008

50. Considering the timelines involved in preparing the various outputs, and the urgency of putting the technical report and the data analysis manuals out as soon as possible for others to effectively use the PISA data, it is suggested to focus the 2008 work programme in this area on the following outputs:

- *For publication in 2008:*
 - The PISA 2006 Technical Report
 - The PISA 2006 Data Analysis Manuals
 - Policy brief: Gender differences in science attitudes, competencies and knowledge
 - Policy brief: Excellence in education: characteristics of the best performing students in PISA
- *For publication in 2009:*
 - Thematic report: The teaching and learning of science
 - Thematic report: Against the odds – Overcoming the impact of social disadvantage on educational outcomes
 - Collection of items from PISA 2000, PISA 2003 and PISA 2006

ANNEX

Country responses***Australia***

1. In order of priority, the following three *thematic analyses* were of interest:
 - The teaching and learning of science;
 - Engaging students in science learning: how science learning matters; and
 - Against the odds – Overcoming the impact of social disadvantage on educational outcomes.
2. Three *policy briefs* were highlighted by the majority of NAC members:
 - Excellence in education: characteristics of the best performing students and schools in PISA
 - Policy brief on the PISA 2006 computer-based science assessment
 - Results from the ICT component of the 2006 questionnaire.
3. Among the *methodological and technical reports*, apart from the Technical Report and Data Analysis Manuals which we consider essential, there was interest in a publication of collected items from PISA 2000, PISA 2003 and PISA 2006.

Austria

4. AUT agrees on the proposed PISA 2006 reporting plan in general but would like to note the following aspects:
 - “The teaching and learning of science” – AUT suggests to base any link between PISA and TALIS on a convincing methodological concept;
 - “Engaging students in science learning – how science learning matters” – analysis should be based mainly on data from the PISA core instruments (where data from all participating countries is available) and only be enriched by the use of data of international options (e.g. parents questionnaire);
 - “How parents can shape students’ aspirations to science careers” – as this kind of analysis is already included in the “Engaging students in science learning” proposal, an extra report seems to be dispensable;
 - “A report on the PISA grade-based sampling option” – decision and sharing of costs should be done by countries that participated in the grade-based sampling option;

Belgium (Flemish Community)

In-depth thematic analyses:

5. The following thematic analyses to be pursued and financed by the central budget:

- *Against the odds – Overcoming the impact of social disadvantage on educational outcomes:* If there are not enough countries interested in this analysis, Flanders will consider making a special contribution because this is highly policy-relevant for us. However, in that case, I would need to know how much would be required preferably by September 2007.
- From global issues to local classrooms – what students know about environmental issues and how they care about it
- The teaching and learning of science

6. The following thematic analysis is interesting but are there enough interest among countries and money left in the central budget: *Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA*

7. To be financed by countries participating in the parent questionnaire option but not interesting for Belgium Fl: *How parents can shape students' aspirations to science careers*

8. Not interesting enough to be pursued: Engaging students in science learning – how science learning matters and Improving educational efficiency – schooling outcomes and educational investment

Policy briefs

9. The following policy briefs to be pursued and financed by central budget:

- *Gender differences in science attitudes, competencies and knowledge,*
- *Results from the ICT component of the 2006 questionnaire,*
- *Policy brief on the PISA 2006 computer-based science assessment (accompanied by an electronic presentation demonstrating the items and the results from the participating countries)*

10. The following policy brief is interesting but is it feasible and are there enough countries interested? If not: Flanders is not interested:

- *Excellence in education: characteristics of the best performing students and schools in PISA*

11. To be financed by countries participating in the option:

- *A report on the PISA grade-based sampling option*

12. Flanders is not interested in (in other words: not to be pursued):

- *A comparison of public and private schools*
- *Methodological and technical reports*

13. The following reports are absolutely essential and should be pursued and financed by central budget:

- *The PISA 2006 Technical Report*
- *The PISA 2006 Data Analysis Manuals.*

14. Not to be pursued:

- Review of policy impact of PISA
- Collected items from PISA 2000, PISA 2003 and PISA 2006.

Suggested sequence by Belgium FI

15. This sequence is based on urgency, policy-relevance and my estimation of feasibility for the OECD Secretariat.

- The PISA 2006 Technical Report
- The PISA 2006 Data Analysis Manuals
- The teaching and learning of science
- Gender differences in science attitudes, competencies and knowledge
- *Against the odds – Overcoming the impact of social disadvantage on educational outcome: One of our ‘hot issues’*; should be published middle of 2009 at the latest (end of Flemish legislature).
- Results from the ICT component of the 2006 questionnaire
- From global issues to local classrooms – what students know about environmental issues and how they care about it: Should not be postponed until 2011 though because we may lose momentum.
- *Policy brief on the PISA 2006 computer-based science assessment* (accompanied by an electronic presentation demonstrating the items and the results from the participating countries)
- Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA

Belgium (French Community)

In depth thematic analyses

16. ***The teaching and learning of science.*** Country and individual levels look more interesting than school level: indeed, in Belgium, there are tracks in most schools, and we expect to find more differences between those tracks than between the schools. Moreover, PISA assesses cumulative learning, and some students change schools rather often. Checking the consistency of the students' answers about learning approaches would give a first idea of the feasibility of such analyzes. To give internationally valid results, the survey evoked in paragraph 11 would have to be planned very carefully, but it looks like a potentially

rich source of information. The cost is 60.000 €. Does it include the preparation and the management of the additional survey?

17. ***Engaging students in science learning - how science learning matters.*** The PISA students are very young and in many countries, still far away from the time when they will have to choose a career. For that reason, their answers about their educational pathways and careers must be seen as their present view, when they are asked about it within a survey about science: if some of them already have clear projects, others probably don't have any prior idea and write down something which has not been long considered. In "behavioral variables", the phrase in italics (first bullet) isn't a synthesis of the paragraph. In paragraph 23, "Values beliefs": the word "negative" sounds strange after "general" and "personal". In "Motivational orientations", "intrinsic" is not given its usual meaning, which refers to a motivation due to the learning process itself or to curiosity, without expectation of a benefit. "Future-oriented" seems to refer more to an extrinsic motivation, close to career-oriented. Could you check it, please?

18. ***From global issues to local classrooms.*** I wonder if the first sentence of page 12 (end of paragraph 27) refers to the existence of environmental problems in the student's surrounding? Could the sentence be made more explicit? Paragraph 30: is it necessary to limit the additional survey to a small group of countries? Given the importance of the topic, is it too difficult to ask the information about every (interested?) country?

19. ***Against the odds.*** In paragraph 32, it should be recalled that science literacy is important for citizenship too. The "policy questions" looks more like "data sources". Third bullet in paragraph 34: there should be an interesting reflexion about the "exceptional" scores. Is it a relative or an absolute category? Could we select the students who get scores which are statistically different from those of similarly disadvantaged students? The costs are not parallel to those of the other reports (differences in the proportions of the write-up and the layout). Is there any reason for it?

20. ***Improving educational efficiency.*** The question is very complex, and any report would imply much deeper analyzes

21. ***How parents can shape.*** Isn't the writing of this report included in the amount paid by the participating countries?

22. ***Student success in the years following PISA.*** A re-analysis of data from only two countries doesn't look as a PISA report.

Policy briefs

23. ***Gender differences.*** No comment.

24. ***Excellence in education.*** First of all, we cannot define a "best-performing school" without taking into account its whole population: "the types of schools that high-achieving students attend". A high-performing school is a school which helps its students to reach higher levels of competencies than expected given their personal features. The elitist meaning given here to "high-performing schools" is not acceptable. In addition, the design of PISA doesn't allow to distinguish the "best-performing schools": we haven't tools to distinguish safely the results due to recruitment from those due to the schools' efficiency. And information about families' SES is not enough: in countries like Belgium, there are families who chose one school for one of their children who is very good at school, but another one for another child who is less involved in his/her studies. As we don't have any information about the students' competencies at the time of their arrival in a school (a longitudinal study would be necessary), we can only describe the schools with the best results and it would be quite unfair, as some of them only select the most motivated or the best students. For those reasons, the report should only tackle the topic of high-performing students.

25. *A comparison of public and private schools.* The topic is extremely complex and potentially very polemic too. The analyzes should be very carefully done if we want to avoid any wrong interpretation. Moreover, the usefulness of the results is not clear: the policy-makers, the main audience of PISA, cannot just change the reality in their country from the point of view of the rates of public and private schools. Possible advises to the parents about the choice of a private or a public school would be wrong (statistical results cannot be safely applied in an individual concrete context). Such a specific report could endanger some schools' taking part in the next PISA cycles.

26. *Results from the ICT component.* No comment.

27. *A report on the PISA grade-based sampling option.* Paragraph 66: which is the relationship between the grade-based option and regional comparisons? Although it could be interesting to know which countries have chosen this option, the way the additional sample has been chosen (not mentioned in the list yet), their reasons for doing so and the add-on value of it, it doesn't seem to be worth a whole report.

28. *Policy brief on the PISA 2006 computer-based science assessment.* The questions are interesting. We should add some comparisons of the relationship between students' results to CBAS and SES and reading scores with this relationship in the case of the paper-based test.

Methodological and technical reports

29. **The PISA 2006 technical report:** No comment. Very important.

30. **The PISA 2006 data analysis manuals:** No comment. Very important.

31. **A review of the policy impact of PISA:** Why is this possible report in this category? It looks more like a policy-brief and has not the same importance as the two other papers of this category. The topic is interesting, but hardly feasible. The explanation of reforms by PISA or not might be a policy question more than a picture of the reality. To give a valid description of the impact of PISA would request a careful analysis of the precise timing of the reforms, of the justifications given in the preparatory papers, and so on.

32. **Collected items:** To be used in the schools, such a paper should be translated in the teaching languages. More fundamentally, the items are assessment tools, and have not been created as didactic tools.

France

In-depth thematic analyses

- The teaching and learning of science : we are not interested
- Engaging students in science learning – how science learning matters : we are interested, with the idea of comparing with the ROSE assessment on the same subject.
- From global issues to local classrooms – what students know about environmental issues and how they care about it : we are interested
- Against the odds – Overcoming the impact of social disadvantage on educational outcomes : we are interested

- Improving educational efficiency – schooling outcomes and educational investment : we could be interested but need to know more about the aim and methodology, considering what occurred with a so-called B7 INES indicator
- How parents can shape students’ aspirations to science careers : we are not interested
- Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA : not interested

Policy briefs

- Gender differences in science attitudes, competencies and knowledge : we are interested
- Excellence in education: characteristics of the best performing students and schools in PISA : we are interested
- A comparison of public and private schools : not interested
- Results from the ICT component of the 2006 questionnaire : not interested
- A report on the PISA grade-based sampling option : not interested
- Policy brief on the PISA 2006 computer-based science assessment (accompanied by an electronic presentation demonstrating the items and the results from the participating countries) : not interested

Methodological and technical reports

- The PISA 2006 Technical Report (methodological and technical issues) : we are interested
- The PISA 2006 Data Analysis Manuals (methodological and technical issues) we are interested mainly by the SAS manual
- A review of the policy impact of PISA : we wonder about this report. How does it combine with the “evaluation of the policy impact of PISA” (see below). The more convenient would be not to do this report and instead do what is proposed as “evaluation of the policy impact of PISA” (see below).
- Collected Items from PISA 2000, PISA 2003 and PISA 2006 : we are interested, but want this report to be not only a collection of items, but a real critical presentation of what does PISA test, in order to enable countries and specialist to compare the aim and content of PISA to their own objectives and syllabus or curricula

Germany

In-depth thematic analysis

33. The German PISA GB members explicitly support the following proposals:

- Priority: *The teaching and learning of science*

- Priority: *Against the odds – Overcoming the impact of social disadvantage on educational outcomes*
 - Priority: *Engaging students in science learning – how science learning matters* (including aspects of the proposed report "*How parents can shape students' aspirations to science careers*"; due to a lack of data we do not support a separate report on this topic)
34. We support the following proposals with reservations:
- *Improving educational efficiency – schooling outcomes and educational investment*. We fear that the data basis is not sufficient for a separate report.
 - *From global issues to local classrooms – what students know about environmental issues and how they care about it* (The topic as such promises an interesting report; however, the number of thematic reports should be limited.)
35. We reject the following proposal:
- *Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA*. Of course, such analyses would be highly interesting. However, if we understand the draft correctly, only two states have implemented a longitudinal survey. If this is correct (and the actual data basis must be clarified in this respect), it is doubtful whether the results can be generalized and thus become interesting in a broader context or whether only local/regional particularities are measured.

Policy briefs

36. We explicitly support the following proposals (order of publications is irrelevant):
- *Gender differences in science attitudes, competencies and knowledge*
 - *A report on the PISA grade-based sampling option*
 - *Policy brief on the PISA 2006 CBAS*
37. We support the following proposals with reservations:
- *Excellence in education: characteristics of the best performing students and schools in PISA*. This question is also very interesting. However, we fear confounding of performance with other parameters. We cannot see from the draft how these characteristics are to be clearly defined and attributed.
 - *A comparison of public and private schools*. Could be done at OECD level in general. For Germany, the differentiation of private schools is not possible since the case numbers would be too small.
 - *Results from the ICT component of the 2006 questionnaire*. Was already done in 2003 in principle and the planned evaluation is very similar so that the question arises whether this report will present many new or interesting facts.
 - Methodological and technical reports

38. We explicitly support the following proposals:

- *The PISA 2006 Technical Report*
- *The PISA 2006 Data Analysis Manual*
- *A review of the policy impact of PISA*
- We support the following proposal with reservations only (since the tasks are published in the respective frameworks or on the Internet): *Collected Items from PISA 2000, PISA 2003 and PISA 2006*

New Zealand

39. We recognise that care will have to be taken in putting this work programme to ensure it is doable and affordable. We have listed those that would be of greatest interest:

- *Against the odds – overcoming the impact of social disadvantage on educational outcomes*
- *How parents can shape student's aspiration to science careers*
- *Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA – although the cost of this work seems to be quite high given that no data collection is required.*
- *Gender differences in attitudes, competencies and knowledge (policy brief)*
- *Excellence in education: characteristics of the best performing students and schools in PISA (policy brief)*
- *Methodological and technical reports (Steve!)*
- *PISA data analysis manuals (Steve!)*
- *A review of the policy impact of PISA – but we would like to know more about the depth and quality of information this would yield.*

Switzerland

40. Switzerland is especially interested in results showing the influence of system level factors on student achievement. Please find a first statement from the National Project Management.

41. Please note that this is not the official view of Switzerland as for this we should have more time in order to collect the opinions of key stakeholders in educational politics of Switzerland.

Proposed Themes

- *The teaching and learning of science:* Of high interest for Switzerland from our perspective
- *Engaging students in science learning – how science learning matters:* Not a theme of priority from a political point of view but interesting from a pedagogical point of view.

- *From global issues to local classrooms – what students know about environmental issues and how they care about it:* Seems to be interesting
- *Against the odds – Overcoming the impact of social disadvantage on educational outcomes:* The theme is very important for Switzerland but is already well analysed on the national level with the data of PISA 2000 and 2003. We wonder if we would really get new information through this report.
- *Improving educational efficiency – schooling outcomes and educational investment:* Of high interest for Switzerland from our perspective
- *How parents can shape students' aspirations to science careers:* Not relevant for Switzerland as we didn't participate in the parent survey.
- *Student success in the years following PISA – an analysis of longitudinal follow-ups from PISA:* Interesting but methodologically maybe a little bit shaky.
- *Policy briefs:* Switzerland is not interested in a comparison between public and private schools but Switzerland is very interested in a report on the PISA grade-based sampling option.
- *Methodical and technical reports:* They are very useful and absolutely necessary

United Kingdom (Scotland)

42. On reviewing the reporting plan for 2006, our preferences are for:

- Papers on gender differences and excellent performers
- A compilation of the released items in a format suitable for schools
- Thematic reports on a) Overcoming the impact of social disadvantage on educational outcomes and b) An analysis of longitudinal follow-up from PISA, albeit we would like to know more about the proposed methodology for the latter.

Macao-China

43. *“In order to provide information about the context for science teaching, it is proposed to develop a special survey that will collect country-level data on science curricula and policies regarding the instruction on science in participating countries.”* --- This is a good idea in order to explore further to make clear the teaching and learning of science across countries.

44. *“It is proposed to use Structural Equation Modeling to identify the direction and strength of relationships between the variables (i.e. engagement in science) and the outcomes being considered.”*-- Training workshops may be held to familiarize data analysts the use of this analytic method, particularly on multilevel data.

45. *“Finally, a better understanding of curriculum policies regarding the environment would usefully be gained through reference to a variety of educational systems' curriculum statements.”* -- This is not difficult to do and helps to understand country profiles when scientific literacy is explained across countries.

46. *“The PISA 2006 ICT familiarity questionnaire results will not be published in the PISA 2006 initial report and there is therefore a need for such analysis in a separate report.”* -- This report is welcomed and Macao-China is interested to undertake in-depth analyses upon request.