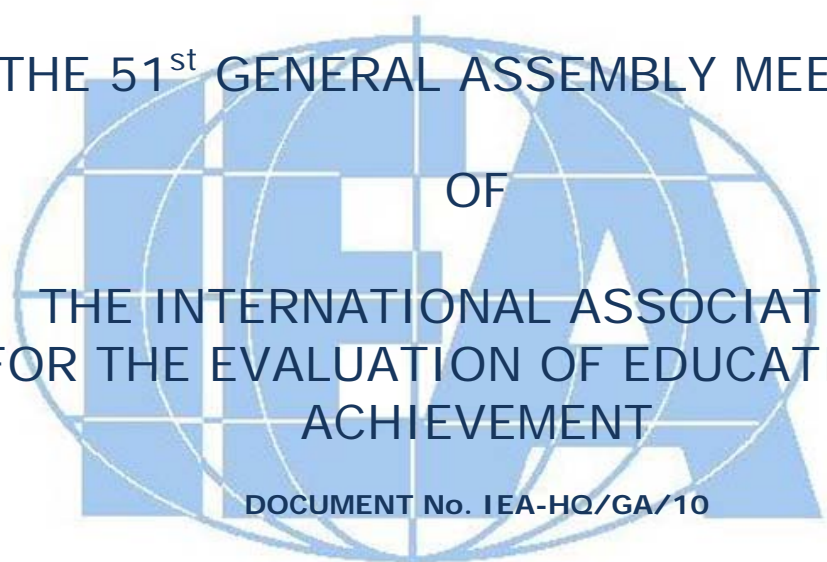


MINUTES
OF
THE 51st GENERAL ASSEMBLY MEETING
OF
THE INTERNATIONAL ASSOCIATION
FOR THE EVALUATION OF EDUCATIONAL
ACHIEVEMENT



DOCUMENT No. IEA-HQ/GA/10

.....

4–7 OCTOBER 2010

Gaborone
BOTSWANA

.....

HOSTED BY
BOTSWANA EXAMINATIONS COUNCIL

LIST OF PARTICIPANTS (GA-51/B)

GA Representatives

1. Australia	i/a John Ainley, ICCS, ICILS, TEDS-M
2. Austria	i/a Michael Lückl
3. Belgium (Flemish)	Leen Vandeputte
4. Botswana	Serara Moahi, SC
5. Canada	Pierre Brochu
6. Czech Republic	i/a Lubomír Martinec
7. Denmark	i/a Per Lindblad Johansen
8. Estonia	Anu Toots
9. Finland	Jouni Välijärvi
10. France	Claude Sauvageot
11. Greece	Georgia Kontogiannopoulou-Polydorides
12. Hong Kong SAR	Frederick Leung, SC
13. Iceland	Júlíus Björnsson
14. Japan	Ryo Watanabe
15. Kazakhstan	Tynyshkul Amreyeva
16. Latvia	Andris Kangro
17. Luxembourg	Amina Kafai
18. The Netherlands	Paul van Oijen, SC
19. Norway	Anne-Berit Kavli
20. Portugal	Hélder Diniz de Sousa
21. Singapore	Chew Leng Poon
22. Slovak Republic	Romana Kanovská
23. Slovenia	Janez Justin
24. South Africa	Vijay Reddy
25. Spain	i/a Rosario Sánchez Núñez-Arenas
26. United States	Tom Loveless, SC

IEA Officers

27. Jur Hartenberg, Secretariat
28. Seamus Hegarty, Chair
29. Paulína Koršňáková, Secretariat
30. Barbara Malak-Minkiewicz, Secretariat
31. Heiko Sibberns, DPC, TEG (*ex officio*)
32. Hans Wagemaker, Executive Director, TEG Chair
33. Alana Yu, Secretariat

IEA Publications and Editorial Committee (PEC)

34. David Robitaille, PEC Chair, Honorary Member

IEA Technical Executive Group (TEG)

35. Larry Hedges, Northwestern University, United States

International Coordinators

36. Julian Fraillon, ICCS, ICILS
37. Michael Martin, PIRLS, TIMSS, TIMSS Advanced, TEG (*ex officio*)
38. Ina Mullis, PIRLS, TIMSS, TIMSS Advanced, TEG (*ex officio*)
39. Wolfram Schulz, ICCS, ICILS
40. Jack Schwille, TEDS-M
41. Sharon Senk, TEDS-M
42. Teresa Tatto, TEDS-M

Observers

43. Zhanat Bazarbekova (National Center for Assessment of the Quality of Education, Kazakhstan)
44. Cyprian Cele (Botswana Examinations Council)
45. Marc Colmant (Ministry of National Education, France)
46. Seau Fah Foo (Ministry of Education, Singapore)
47. Frank Goldhammer (DIPF, Germany)
48. Monamodi Kesamang (Botswana Examinations Council)
49. Susan Makgothi (Botswana Examinations Council)
50. Sarah Maughan (NFER, United Kingdom)
51. Moteane Melamu (University of Botswana)
52. Bontle Molefe (Ministry of Education, Botswana)
53. Chawangwa Mudongu (Botswana Examinations Council)
54. Valena Plisko (NCES, United States)
55. Masako Shinohara (NIER, Japan)
56. Alcyone Vasconcelos (UNESCO Institute of Statistics)

APOLOGIES (GA-51/I/03)

GA Representatives

Adel Al-Sayed (Qatar)
Peter Archer (Ireland)
Michal Beller (Israel)
Lorna Bertrand (England)
Christiane Blondin (Belgium French Community)
Sándor Brassói (Hungary)
Jasminka Buljan Culej (Croatia)
Loreto Fontaine (Chile)
Fiona Fraser (Scotland)
Karine Harutyunyan (Armenia)
Seong-Yul Kim (Korea)
Eckhard Klieme (Germany)
Mary Koutselini (Cyprus)
Galina Kovaleva (Russian Federation)
Kerstin Mattsson (Sweden)
Maia Miminoshvili (Georgia)
Mark Némét (Austria)
Ester Ogena (Philippines)
Margarita Peña (Colombia)
Lars Qvortrup (Denmark)
Enrique Roca (Spain)
Lynne Whitney (New Zealand)
Pavla Zieleniecová (Czech Republic)

International Coordinators/Members of the Committees

Lawrence Ingvarson, TEDS-M (Australian Council for Educational Research)
Norman Verhelst, TEG (CITO, the Netherlands)

Honorary Members

Zoltán Báthory
Albert Beaton
Christiane Brusselmans-Dehairs
Robert Garden, PEC
Rainer Lehmann
Kimmo Leimu
Tjeerd Plomp
Alejandro Tiana
Judith Torney-Purta

Observers

Richard Deiss (European Commission)
Rane Johnson-Stempson (Microsoft Corporation)
Larry Suter (NSF, United States)

MONDAY, 4 OCTOBER 2010**09:00 – 10:00 Session I*****Welcoming Addresses***

Dr Seamus Hegarty, Chair of IEA, opened the 51st IEA General Assembly meeting with a greeting to all participants in Setswana and English. He introduced Prof Moteane Melamu, of the University of Botswana and Chair of the Botswana Examinations Council.

Prof Melamu extended a “heartly Botswana welcome” to IEA on behalf of the Minister of Education and Skills Development and the Botswana Examinations Council. He spoke of Botswana’s Vision for 2016, the year that marks its 50th anniversary of independence. This long-term vision for socioeconomic and political development contains a pillar focused on education, in recognition of the importance of policies that keep pace with changes in the knowledge, skills, and competencies required for the global market. Prof Melamu acknowledged the many contributors that have supported Botswana’s strong foundation in education, including IEA. He urged those visiting Botswana for the first time to enjoy and explore the scenic beauty of the country.

Dr Hegarty thanked Prof Melamu and commended Botswana’s strong commitment to education.

Dr Hegarty then took a moment to reflect on the recent passing of Dr Munther Masri, President of the National Center for Human Resources Development in Jordan and its representative to IEA.

Opening Statements

Dr Hegarty summarized 2010 as a successful year. At this General Assembly the final reports for three IEA studies will be presented: ICCS 2009, TEDS-M, and TIMSS Advanced 2008. Dr Hegarty highlighted recent progress in ICILS, the launch of prePIRLS, and the momentum of TIMSS 2011 and PIRLS 2011, two studies that have become an essential part of educational monitoring in many countries. He concluded that IEA studies are firmly set in the minds of policy makers, helping to improve educational policy and practice worldwide.

Dr Hans Wagemaker, Executive Director of IEA, welcomed participants to the IEA General Assembly meeting and thanked its host, the Botswana Examinations Council. He described a number of important events that took place over the last 12 months, including the release of the TIMSS Advanced 2008 International Report at a press conference in Oslo, Norway (December 2009), the release of the ICCS Initial Findings Report in conjunction with the 4th IEA International Research Conference in Gothenburg, Sweden (July 2010), and the initiation of ICILS at its 1st NRC meeting in Amsterdam, The Netherlands (June 2010). He commended developments in IEA studies and also within various parts of the organization, including the IEA DPC’s contract for the German National Educational Panel Study and the IEA-ETS Research Institute, and the IEA Secretariat’s increasing responsibilities for the translation verification and quality control of IEA studies. He noted the work being done to ensure IEA’s continued financial stability, and gratefully acknowledged the support of its member institutions and participating countries, United States Department of Education/National Center for Education Statistics, and the governments of The Netherlands and Norway.

Honorary Membership for Prof Dr Jack Schwille (GA-51/I/19)

Dr Hegarty presented the nomination of Prof Dr John (Jack) Schwille for Honorary Membership of IEA, in recognition of his achievements and contributions to IEA studies dating back to 1972. He spoke of Dr Schwille’s involvement in the Six Subject Survey,

CIVED, and other studies, including his current work as Co-Director and Co-Principal Investigator of TEDS-M.

That Dr Jack Schwille be approved as an Honorary Member of IEA:

Moved: John Ainley (Australia)

Seconded: Georgia Kontogiannopoulou-Polydorides (Greece)

Carried: unanimously

Dr Schwille thanked the General Assembly for the honor and recognition. He expressed gratitude for having been able to observe IEA mature and develop as an organization—transforming from a small, informal group of distinguished researchers to a well-functioning, organized body of professionals from around the world.

Approval/Amendment of Minutes of 50th GA in Tallinn, Estonia (GA-51/I/02)

No amendments were made to the Minutes of the 50th IEA General Assembly meeting.

That the Minutes be approved:

Moved: Tom Loveless (United States)

Seconded: Georgia Kontogiannopoulou-Polydorides (Greece)

Carried: unanimously

The Minutes from Tallinn were adopted.

Apologies (GA-51/I/03)

Dr Hegarty referred to the list of invitees who sent apologies (see page 4 of the Minutes).

Approval of New Standing Committee Members (GA-51/I/04)

Dr Frederick Leung (Hong Kong SAR) and Dr Pavla Zieleniecová (Czech Republic) concluded their terms as members of the Standing Committee and Dr Hegarty thanked them for their work. The Standing Committee nominated Dr Tongthong Chandransu (Thailand) and Dr Rita Dukynaitė (Lithuania) as new candidates. (Both individuals were unable to attend the General Assembly meeting.)

That Dr Tongthong Chandransu, GA Representative for Thailand, be approved as a member of the Standing Committee:

Moved: Frederick Leung (Hong Kong SAR)

Seconded: Serara Moahi (Botswana)

Carried: unanimously

Dr Chandransu was approved as a member of the Standing Committee.

That Dr Rita Dukynaitė, GA Representative for Lithuania, be approved as a member of the Standing Committee:

Moved: Tom Loveless (United States)

Seconded: Paul van Oijen (The Netherlands)

Carried: unanimously

Dr Dukynaitė was approved as a member of the Standing Committee.

IEA Awards 2010 (GA-51/I/05)

Dr David Robitaille, Chair of the IEA Awards Committee, announced the recipients of the 2010 IEA Richard M. Wolf Memorial award to the General Assembly:

Dr Amita Chudgar, Michigan State University, and Dr Thomas Luschei, Florida State University, for their paper "National Income, Income Inequality, and the Importance of Schools: A Hierarchical Cross-national Comparison," published in the *American Educational Research Journal* (2009, Vol. 46, No. 3).

Dr Robitaille noted that the Dick Wolf Award, which is given for a paper published in a refereed journal, monograph, or book that includes analysis of data from an IEA study, received three outstanding submissions in 2010. There were no applications for the 2010 IEA Bruce H. Choppin Memorial Award, which is given for a dissertation or master's thesis that employs empirical research methods and uses IEA data.

Dr Robitaille congratulated this year's winners and encouraged attendees to share information about the IEA awards with fellow members of the research community to further improve their recognition and the quality of submissions.

10:45 – 12:30 Session II**Approval/Amendment of Agenda (GA-51/I/01)**

Dr Hegarty referred to a revised agenda that was distributed to all participants and asked for flexibility with respect to necessary changes. All changes in the agenda are reflected in the Minutes.

That the amended agenda be approved:

Moved: Paul van Oijen (The Netherlands)

Seconded: John Ainley (Australia)

Carried: unanimously

The agenda was adopted.

PIRLS 2011 and TIMSS 2011 Progress Reports (GA-51/I/07-08)

Executive Directors Dr Ina Mullis and Dr Michael Martin, Boston College, presented the joint progress report for the Trends in International Mathematics and Science Study (TIMSS) 2011 and Progress in International Reading Literacy Study (PIRLS) 2011.

Dr Mullis provided an overview of the TIMSS 2011 assessment and its recent milestones. This study of mathematics and science achievement at the fourth and eighth grades is in its fifth cycle, with 63 countries and 14 benchmarking entities expected to participate. In March–April 2010, a field test was conducted in about 55 countries, and on the basis of its results (including approximately 10,000 student responses per item), instruments for the main data collection were finalized and posted for translation and adaptation by participating countries. The TIMSS 2011 and PIRLS 2011 main data collection has just begun in southern hemisphere countries and will continue through December. The northern hemisphere data collection will take place in March–June 2011. Dr Mullis listed several papers on TIMSS and PIRLS that were recently presented at the 4th IEA IRC, noting interest in both studies' databases among researchers. Dr Martin continued the presentation with a description of the PIRLS 2011 assessment. PIRLS 2011 is in its third cycle, with 53 countries and 6 benchmarking entities planning to participate. New for this cycle is prePIRLS, a less difficult version of PIRLS; together they are designed to align with curricula and provide more options for countries to assess their students' level of reading achievement at the fourth grade. In the past year, a field test was conducted in

46 countries and 4 benchmarking entities, and the main data collection materials were prepared after a collaborative review process. Dr Martin detailed the development of the TIMSS 2011 and PIRLS 2011 background questionnaires. He pointed to the contextual frameworks for the questionnaires, noting that with a renewed focus on effective contexts for teaching and learning, a number of new scales have been developed, such as home numeracy activities, student engagement, principal leadership style, and teacher career satisfaction. The 2011 assessment questionnaires were designed in modules to meet the needs of almost 50 education systems participating in both studies at the fourth grade (most assessing the same students), as well as countries participating in PIRLS/prePIRLS only, TIMSS only at Grade 4, or TIMSS at Grade 8. Among the final outputs from the 2011 projects will be independent international reports in mathematics, science, and reading, and also a joint PIRLS-TIMSS report. The PIRLS-TIMSS international report will include analyses of the effectiveness of schooling policy and practice, the effect of reading proficiency on mathematics and science achievement, profiles of high-achieving students, and equity issues (gender, language, social background).

Participants' questions focused on aspects of the joint assessment, reporting, the PIRLS web-based reading module, and prePIRLS. Ms Rosario Sánchez Núñez-Arenas (Spain), Ms Anne-Berit Kavli (Norway), and Dr Janez Justin (Slovenia) commented on the advantages of the joint assessment. Ms Sánchez asked about the possibility of offering PIRLS on a 4-year cycle, and she and Ms Kavli asked for details on the PIRLS-TIMSS joint report. Dr Mullis explained that it would be difficult to change the PIRLS schedule for a number of reasons, among them the time required for creating high-quality reading passages. Plans for the joint international report are still being finalized but it will be aimed towards policy makers. Dr Justin asked if the International Study Center (ISC) would be willing to review and comment on a national report on the joint assessment, and Dr Mullis affirmed the ISC's interest and support.

Ms Kavli asked about the relationship between age and grade in TIMSS and PIRLS. In a case study of two countries (Iceland and Norway) participating in PIRLS 2006 at the fourth and fifth grades, results showed a clear relationship between age within a grade and reading achievement (older students tended to perform better). Dr Martin explained that an analysis was conducted of PIRLS 2006 data¹, indicating that there was no simple way to adjust countries' average reading achievement for differences in age. Countries' differing policies on age of school entry, promotion, and retention make this a complex issue. Dr Martin stated that IEA studies are based on grade (i.e., number of years of schooling), letting the age of students—which can be manipulated through policy—vary. Dr Vijay Reddy (South Africa) inquired about the data of countries that are participating off-grade. Referring to a paper presented at the 4th IEA IRC², Dr Martin answered that when an assessment's items are too difficult for many students, there is a "floor effect" (scores below the lowest level), leading to a result that is artificially biased upward and that can affect how improvement is measured over time. Under a better understanding of the 'boundary' of reliable measurement, ISC discussions with some participating countries have resulted in the decision to join prePIRLS or test off-grade, so that these studies can provide better information about the proficiencies of students. Dr Wagemaker affirmed the importance of identifying the most appropriate target population for each country, rather than forcing all countries onto the same rubric. Dr Serara Moahi (Botswana) noted that this development will add significant value for Botswana, which is participating in prePIRLS at Grade 4, PIRLS-TIMSS at Grade 6, and TIMSS at Grade 9.

Ms Kavli asked about the PIRLS web-based assessment. Dr Mullis and Dr Wagemaker confirmed that extensive preliminary work on a web-based reading component for PIRLS

¹ Martin, M.O., Mullis, I.V.S., & Foy, P. (2008). *Interrelationships among reading achievement, grade level, and age in PIRLS 2006*. Paper presented at the 3rd IEA International Research Conference, Taipei, Chinese Taipei.

² Foy, P., Martin, M.O., & Mullis, I.V.S. (2010). *The limits of measurement: Problems in estimating reading achievement in PIRLS 2006 for low-performing countries*. Paper presented at the 4th IEA International Research Conference, Gothenburg, Sweden.

2011, including a sample module, was conducted in response to NRC requests. However, too few countries were able to commit to the project to sustain the development costs for this cycle. The intention to offer a web-based module as part of PIRLS 2016 will be formally announced. Dr Jouni Välijärvi (Finland) asked for information about (i) the difference between a participating country and benchmarking entity, and (ii) prePIRLS. Dr Mullis clarified that a benchmarking participant is typically a regional sub-entity of a country. She explained that prePIRLS was patterned on the PIRLS framework, but with some differences: (i) more emphasis on retrieval and straightforward inference than evaluation, (ii) less difficult reading passages, and (iii) questions interwoven throughout the passages. Dr Paul van Oijen (The Netherlands) inquired about the possibility of a “preTIMSS” test. Dr Martin and Dr Wagemaker responded that it was under much consideration.

Dr Hegarty thanked the study team for their efforts in this challenging endeavor, which will provide considerable possibilities for in-depth analysis and address fundamental questions in educational research and policy.

PEC Annual Report (GA-51/III/13)

Dr David Robitaille, Chair of PEC, described recent changes and activities of the Publications and Editorial Committee (PEC). At the end of last year, Dr Nancy Law, University of Hong Kong, resigned from her role on the committee and was replaced by Dr Anu Toots (Estonia). On behalf of the committee, Dr Robitaille thanked Dr Law for her valued contributions. He noted that 2010 was another busy year for PEC, with work focusing on the review of publications from three projects: (i) *IERI Monograph Series Volume 3*, (ii) the first findings report and two other volumes for TEDS-M, and (iii) the first findings and extended international reports for ICCS. He announced that committee members have discussed establishing terms of reference to help study directors make more frequent use of the expertise and experience available through PEC, and encouraged them to involve PEC in the development of their publications as early in the process as possible to maximize the opportunity for contribution.

Dr Hegarty thanked PEC colleagues for helping to ensure the high quality of IEA publications.

TEG Annual Report (GA-51/III/14)

Dr Hans Wagemaker, Chair of TEG, summarized the most recent meeting (1 October 2010) of the Technical Executive Group (TEG), which provides technical advice and quality assurance for IEA studies. The committee’s discussion focused on issues of analysis and presentation of the results of TEDS-M and ICCS, which are in their final stages, with TEG offering some recommendations for the organization of tables (TEDS-M) and regional module results (ICCS). The committee also discussed the proposed methodology for the ICILS data collection, and focused on a number of technical issues related to TIMSS 2011 and PIRLS 2011, such as: (i) reporting for low-performing countries and recommendations for off-grade assessment; (ii) possible effects of the joint assessment (controlled through a counterbalanced design); and (iii) joint scaling of the PIRLS/TIMSS data.

Dr Hegarty thanked TEG members for their insights and expertise on important study issues.

Letter from European Commission: Intention to Support ICILS

Dr Hegarty distributed a recent letter from the European Commission DG Education and Culture, which announces the Commission’s intention to support eligible European countries’ participation in ICILS. In the letter, Head of Unit Mr Denis Crowley affirms the importance of this area of research to the Commission, noting that digital skills were

identified as a key competency for Lifelong Learning and ICT skills were listed among 16 core indicators for monitoring progress and performance in education, according to the Educational Council Conclusions of May 2007. Dr Hegarty thanked the Commission for its support.

14:00 – 15:30 Session III

ICILS 2013 Progress Report (GA-51/I/10)

The International Computer and Information Literacy Study (ICILS) progress report was given by International Coordinators Dr John Ainley and Mr Julian Fraillon, both of the Australian Council for Educational Research (ACER). Mr Fraillon presented the report.

Mr Fraillon summarized recent developments in ICILS. Over 20 countries have expressed interest in joining the study, which will assess Grade 8 students' computer and information literacy (CIL) and its contexts in 2013. Work in the past year has focused on framework and instrument development; this was also a key focus of the 1st NRC meeting (Amsterdam, June 2010), which was attended by 28 representatives from 18 countries and 2 representatives from the European Commission. A draft of the assessment framework and instruments (five student test modules in storyboard form and student, teacher, school, and national context questionnaires) will be available in October–November 2010 for NRC review. The test modules are being developed initially as static mockups for content review/approval before transfer to the computer-based delivery system, as this is the most expensive aspect of instrument development. Mr Fraillon presented an exemplary module as it would appear on the secure section of the ICILS website for NRC review, demonstrating the basic file management set-up, the rating and comment functionality, and the supplementary materials that will be available (such as rating criteria and scoring notes). A notable feature of the online review process is that ISC staff will have immediate access to the NRCs' feedback for its development work.

The discussion focused on various aspects of the ICILS instruments. Dr Georgia Kontogiannopoulou-Polydorides (Greece) asked whether the student module assesses knowledge and capabilities in information and communication technology (ICT) only or in other school subjects as well, and Dr Tom Loveless (United States) asked about collaboration as an element of the student tasks. Mr Fraillon stressed that ICILS is an interdisciplinary assessment and the modules represent a range of focuses, tasks, and contexts related to CIL. One module, for instance, has a stronger reading literacy focus (students must evaluate online texts for relevance); another requires the use of empirical data to create a digital presentation. Although it is not possible to facilitate live interaction in the student modules—both from a technical and an assessment perspective (as students would not receive the same test)—collaboration and information sharing are incorporated in other ways, such as through tasks involving email or comments on a website. Dr Paul van Oijen (The Netherlands) asked about the teacher sample design; Mr Fraillon answered that it will include teachers of students in the target grade across all subjects (like in ICCS).

Dr Hegarty thanked Mr Fraillon for the report, expressing the hope that more countries will take advantage of this unique opportunity for assessment.

DPC Annual Report (GA-51/III/15)

Mr Heiko Sibberns, Co-Director of the IEA Data Processing and Research Center (DPC), referred General Assembly representatives to the written report distributed in advance of the meeting, which describes current DPC projects in detail. His presentation focused on the DPC's involvement in the National Educational Panel Study (NEPS) in Germany. He described NEPS as an "ambitious and challenging enterprise," involving more than 90 separate sub-studies/projects in 2009–2013 (the first funding period). This longitudinal

study divides educational biographies into eight stages—from birth to adult education—with a focus on critical transitions (e.g., elementary to lower secondary, vocational training to labor market), making it possible to analyze long-term developments in educational pathways within five theoretically-defined “pillars.” These pillars are: (i) competence development, (ii) learning environments, (iii) social inequality and educational decisions, (iv) education acquisition with migration background, and (v) returns to education. The data collection for this study is based on a *multicohort sequence design*, with three starting cohorts recruited in 2010 through the DPC (kindergarten, Grade 5, and Grade 9 students), and new starting samples in later years. Mr Sibberns outlined some of the DPC’s major activities for the project, including sampling, communications, manuals and training, data entry and processing, documentation.

Dr Vijay Reddy (South Africa) inquired about study cost, Dr Georgia Kontogiannopoulou-Polydorides (Greece) asked if results will be available in English, and Ms Anne-Berit Kavli (Norway) asked about resources for further information on this project. Mr Sibberns indicated that the total bid is about €80–100 million, funded by the German Federal Ministry of Education and Research (BMBF). The outcome of NEPS will be an extensive database that can be used for research. This data will be public (possibly with some restrictions). Additional information on NEPS is available online, in both German and English.³ Dr Paul van Oijen (The Netherlands) asked about the advantages of a multi-cohort design. Mr Sibberns explained that it allows researchers to obtain data (and results) for older cohorts much more quickly, without the necessity of waiting for the starting cohort to age.

Dr Wagemaker and Dr Hegarty noted that NEPS represents an extraordinary level of commitment, in addition to the DPC’s many other international and national activities, and acknowledged the significant contributions of Mr Sibberns and Mr Dirk Hastedt, DPC Co-Director (who was unable to attend).

Financial Report (GA-51/III/16-18)

The IEA Financial Report was given by Dr Hans Wagemaker, Executive Director, and Mr Jur Hartenberg, Financial Manager. Mr Hartenberg referred General Assembly members to IEA’s “Annual Report for the Year 2009” and provided an overview of IEA’s financial statements for 2009, 2010 forecast, and 2011 budget. He also distributed an updated list of outstanding fees.

Presenting IEA’s balance sheet as of 31 December 2009, Mr Hartenberg noted concern, on the debit side, about the high receivables figure of \$6.1 million, 62% of which is attributable to unpaid membership and participation fees. He pointed out that the ratio of unpaid to paid fees has increased over the last five years. Positive developments were shown in IEA’s total cash and project fund levels, which increased by \$1.9 and \$2 million, respectively, over 2008. He stated that the allocation of project funds has shifted from a spread across 6 IEA studies in 2008 to a concentration on TIMSS and PIRLS, due to changes in the projects’ life cycles and the completion of several studies. In accord with Dutch accounting rules, a new item was added to the balance sheet—the *continuity reserve*—which represents the amount needed (\$8.5 million) for dismantling the organization in case of liquidation. Net assets, calculated as a combination of the continuity and project reserves, increased to \$4.7 million, up from \$4.2 million in 2008. IEA’s profit and loss statement for the year ending 31 December 2009 showed excess revenue of \$457,000, positively affected by foreign exchange rates and a 4.6% decrease in operating expenditures compared to 2008. In 2010, activity levels are expected to be very close to actual 2009 figures. 2011 revenue and operating expenditures are both projected to increase about 7% over 2010, continuing to keep the trend lines of income and expenses closely linked, as they should be in a nonprofit organization with proper occupancy rates and cost pricing.

³ www.uni-bamberg.de/en/neps.

Mr Hartenberg and Dr Wagemaker concluded the presentation with a request to all member education systems and those participating in IEA studies to pay debts and fees on time, and to communicate with IEA if an invoice cannot be paid within 30 days. A summary of outstanding fees will continue to be distributed biannually.

Dr Hegarty thanked Mr Hartenberg and Dr Wagemaker for their efforts in ensuring that IEA's finances remain in a healthy state.

Approval of 2009 Annual Report

Dr Hegarty brought forward a motion to the General Assembly for approval of the 2009 Annual Report, on formal recommendation of the Standing Committee.

That the 2009 Annual Report be approved:

Moved: Paul van Oijen (The Netherlands)

Seconded: John Ainley (Australia)

Carried: unanimously

The Annual Report was approved.

16:00 – 17:30 Session IV

Discussion Groups: Pre-Primary Education and Other Possible IEA Studies

Dr Wagemaker introduced a group discussion on possible topics for a new IEA study, such as pre-primary education. He commented that this was an important opportunity to take stock of what IEA has done as an organization and where it is headed. He encouraged group members to consider the benefits for a particular area of investigation (particularly for cross-national comparison), funding options, and the assessment activities that might be involved.

TUESDAY, 5 OCTOBER 2010

09:00 – 10:30 Session V

TEDS-M Final Report (GA-51/II/12)

The Teacher Education and Development Study in Mathematics (TEDS-M) final report was presented by study leaders from Michigan State University, Dr Teresa Tatto, Dr Jack Schulle, and Dr Sharon Senk. Dr Tatto summarized the study's research questions, sampling adjudication criteria, and participation outcomes. Dr Schulle presented the six program types used for cross-national comparison, using Chinese Taipei and Switzerland as examples of the considerable organizational complexity involved. Dr Tatto next presented highlights from the background data collection on institutions, teacher educators, and future primary and secondary mathematics teachers. This included sample tables on institutional requirements for primary teacher program completion (showing that countries varied most in examination type and frequency) and motivations for becoming a teacher. Dr Senk focused on aspects of the analysis of future teachers' mathematics content knowledge (MCK) and mathematics pedagogy content knowledge (MPCK) and described the anchor points for each scale. She highlighted the considerable differences between countries with the same program type, as well as between program types within the same country. Dr Tatto summarized selected results for future teachers' opportunities to learn (which covered university and school level mathematics, mathematics education, general pedagogy, and other areas) and beliefs about mathematics teaching and learning. She noted that opportunities to learn general

pedagogy and engage in field experience were universally available, but their duration and nature varied across countries/program types.

Dr Georgia Kontogiannopoulou-Polydorides (Greece) asked about the teacher educators who were included in TEDS-M; Dr Tatto explained that they were defined as those educators who taught a required course in mathematics, mathematics education, or pedagogy in 2007–2008 to future teachers in the target population. Ms Anne-Berit Kavli (Norway) asked for more information about (i) reporting delays, (ii) international comparability of results, and (iii) policy relevance. Dr Tatto explained that there were a number of factors involved in the accumulation of delays, including the timing for the return of national data and the lengthy collaborative process involved in data analysis and reporting. As TEDS-M is the first IEA study in tertiary education, the complex aspects of the study had to be worked out without the benefit of previous cycles. Grouping programs with shared characteristics makes international comparisons possible and allows countries to see which policy approaches achieve similar outcomes. Dr Tatto pointed out another important policy-related benefit of the study: capacity building. TEDS-M provided participating countries—many of whom had never carried out an assessment of teacher education—with a framework to conduct research on their teacher education programs, institutions, and future teachers.

Dr Hegarty thanked the TEDS-M study team, stating that this study of the challenging area of teacher education represents a significant achievement for IEA.

11:00 – 12:30 Session VI

Announcements (GA-51/I/06)

Dr Wagemaker announced the publication of the third volume of the IEA-ETS Research Institute's *IERI Monograph Series* on the science of large-scale assessment.⁴ This series of publications, which forms an important part of IEA's research activities, continues to receive an increasing number of paper submissions and requests from libraries.

Presentation of TEDS-M Policy Report

Dr John Ainley, on behalf of the TEDS-M consortium members from ACER, gave a summary of the TEDS-M Policy Report, *National Policies and Regulatory Arrangements for the Preparation of Future Teachers in 17 Countries*. This report presents teacher education policies and practices in the 17 TEDS-M participating countries, with two main parts: (i) organizational characteristics, context, development, and conditions of teacher education, and (ii) quality assurance arrangements associated with teacher education programs and entry into the teaching profession. A key issue being explored in the report is whether there is an association between the strength of quality assurance arrangements for teacher education programs and the quality of their graduates, and in particular, whether this relationship is evident in their TEDS-M mathematics and mathematics pedagogy scores. The analysis showed that there is variation among countries in their policies related to program entry, accreditation, and quality of graduates, and that an association does exist between countries' quality assurance ratings and mean scores on the TEDS-M tests.

Several participants expressed their interest in the report. Dr Georgia Kontogiannopoulou-Polydorides (Greece) asked for clarification on how countries were classified on requirements for entry into the teaching profession. Dr Ainley described the three groupings used: (i) no requirements, other than graduation from a teacher education program, (ii) graduates must pass further tests, and (iii) graduates must pass further tests and performance assessments. Dr Paul van Oijen (The Netherlands)

⁴ von Davier, M., & Hastedt, D. (Eds.). (2010). *IERI Monograph Series: Issues and Methodologies in Large-Scale Assessments* (Vol. 3). Hamburg/Princeton, NJ: IEA-ETS Research Institute. This and other volumes in the series can be obtained from the DPC or the IEA Secretariat, or downloaded from www.ierinstitute.org.

mentioned an analysis in connection with PISA on the impact of teacher recruitment and selection on country performance, noting that these kinds of analyses seem difficult to apply in the case of The Netherlands, where there is a shortage of teachers (because of high numbers going into retirement). Dr Jack Schwille (TEDS-M) referred to the first part of the policy report, which deals with issues of supply and demand. He commented that policy can sometimes come up against hurdles—setting high standards may not work if there is not an adequate pool of applicants. Dr Frederick Leung (Hong Kong SAR) asked if the analysis found differences between primary and secondary programs. Dr Ainley indicated that there may be some differences despite similar policies at the two levels, but more investigation is warranted.

ICCS 2009 Final Report (GA-51/II/11)

The International Civic and Citizenship Education Study (ICCS) final report was given by Project Coordinator Dr John Ainley and Research Director Dr Wolfram Schulz, both of ACER. Dr Ainley summarized the ICCS objectives and design, stressing the novelty it introduced to IEA studies through the regional modules for Asia, Europe, and Latin America. The Initial Findings Report⁵ was released in June 2010, providing international results for Grade 8 students' knowledge and understanding in civics and citizenship, their related attitudes, perceptions, and behaviors, and the national, community, and school contexts in which these occur. This will be followed by an extended international report (containing more detailed results and multivariate analyses), as well as three regional reports, the international database, technical report, and civic and citizenship education encyclopedia.

Dr Schulz continued the presentation with a summary of ICCS results. He noted that there was a diversity of approaches to civic and citizenship education, including providing it as a separate course, integrating it into other subjects, and including it as a cross-curricular theme. There was also considerable variation both between and within countries in students' civic knowledge and understanding. Compared to the IEA CIVED study of 1999, there was also a significant decline in civic content knowledge in 7 of 15 countries for which trend comparisons were possible. Dr Schulz discussed some correlates of civic knowledge such as test language, gender, socioeconomic background, media use, and discussions with parents. Most students supported basic democratic values and gender equality, were more interested in domestic political or social issues than foreign issues/international politics, and expected to vote as adults, but not to engage in more active forms of civic participation such as joining a political party or running for office. Political parties were the least trusted civic institution, and about half of all students did not express any preferences for a political party, though this varied across countries. Most teachers cited the development of knowledge and skills as the most important aim of civic and citizenship education, rather than active participation.

There were a number of discussion questions related to study outcomes and reporting. Mr Pierre Brochu (Canada) commented on some similarities in country rankings between ICCS and other international assessments like TIMSS and PISA. He also asked about challenges with the ICCS teacher response rates, observing that ICILS has a similar sampling scheme. Dr Ainley noted that a variety of factors affected the low teacher response rates in ICCS, including perception of this specific topic by teachers but also socio-political events such as teacher strikes. Dr Tom Loveless (United States) asked about possible effects of current events on student responses and its use in civic and citizenship teaching. Dr Schulz responded that the contexts of the time period must be taken into account when interpreting results; some items in the student questionnaire address the extent to which current events are discussed in the classroom (as a measure of openness). Dr Frederick Leung (Hong Kong SAR) and Dr Janez Justin (Slovenia) commented on the wider relevance of certain questions included in the specific modules. Dr Schulz stated that items for the international and regional assessments were selected

⁵ Schulz, W., Ainley, J., Fraillon, J., Kerr, D., & Losito, B. (2010). *Initial findings from the IEA International Civic and Citizenship Education Study*. Amsterdam: IEA.

in separate processes of agreement, involving only those participating countries. In future cycles of ICCS, there will be opportunity for countries to discuss adding new questions of interest. Ms Leen Vandeputte (Belgium-Flemish) inquired about reporting delays and possibilities for repeat cycles of ICCS. Dr Schulz and Dr Ainley noted that the delay was due mainly to late data deliveries, resulting in the decision to publish an initial findings report in order to meet reporting commitments. Dr Barbara Malak-Minkiewicz (IEA Secretariat) informed participants that the release date for the extended international and European reports is 22 November 2010. Dr Wagemaker indicated that the European commission has expressed interest in ICCS as part of their regular collection of indicators. **A repeat cycle might be offered in 2015 at the earliest or 2017 at the latest.** An announcement will be made at the next General Assembly meeting.

Dr Hegarty thanked the ICCS team for the comprehensive report, and looked forward to the release of the reports and further research on the dataset.

14:00 – 15:30 Session VII

Impact of IEA Studies on National Curricula

Dr Hegarty invited panelists Mr Lubomír Martinec (Czech Republic) and Ms Rosario Sánchez Núñez-Arenas (Spain) to speak about the impact of IEA studies on their countries' curricula and education systems.

Mr Lubomír Martinec presented a case study of the use of TIMSS 2007 mathematics data for curricular framework and teacher development in the Czech Republic. Results from TIMSS 2007 were concerning, as they showed the largest score decrease in Grade 4 mathematics achievement since 1995 of any European or OECD country. A detailed topical analysis of the Grade 4 mathematics results identified fractions and decimals as areas of weakness. Topics in the Czech curriculum were roughly the same as in TIMSS, and this raised questions ("Were fractions taught too little or too late?"), pointing to the need for further analysis at the individual item level, including performance and omission rates relative to the international average. As a result, a series of teacher manuals are being developed using released items from TIMSS, PISA, and PIRLS, which provide information on some common misconceptions and errors made by Czech pupils. A suggested long term solution has been to introduce fractions earlier in the Czech curricular framework. The next step will be to continue these kinds of analyses for TIMSS science data and other international assessments.

Mr Pierre Brochu (Canada) raised an issue of the usefulness of analyzing data at the level of individual items. Mr Martinec and Dr Ina Mullis (TIMSS and PIRLS) both considered it helpful; Dr Mullis emphasized that, although advances in methodology make summarization more effective, item analyses can provide a more detailed understanding of study results. Dr Tom Loveless (United States) raised the idea of conducting a similar topical analysis of TIMSS 1995 data, in order to determine if fractions were also an area of underperformance then, or if there was change over time.

Ms Rosario Sánchez Núñez-Arenas spoke of the influence of IEA studies on curricula and other aspects of education in Spain. With recent legislation focusing greater attention on competencies, PIRLS is considered an important study because it assesses students in primary education, at a time when children learn to read. PIRLS 2006 results showed that Spanish students could generally understand and make inferences on informative texts, but had more difficulty with literary texts and linking information to previous knowledge. Descriptions of benchmarks were useful for communicating national results to teachers, and indicated that efforts could be intensified for both higher- and lower-performing students. Initiatives to improve reading competence include laws requiring the allocation of time for reading in primary education and the presence of a library in all schools, and a project offering online reading resources for parents and

students. Ms Sánchez stated that similar use was made of results from other studies like ICCS (analyzing results on the basis of knowledge domains, performance benchmarks, gender, variance, socioeconomic status, and remediation).

There were a number of comments about remediation within specific national contexts. Discussants emphasized the complexity of the issue and the difficulty of determining the impact of grade repetition. Mr Claude Sauvageot (France) and Mr Brochu both noted that the performance level of students before remediation must be taken into account. Mr Brochu suggested doing a macroanalysis of countries with different policies in this area. Mr Michael Lückl (Austria) noted that concerns about remediation have resulted in attempts to make the Austrian education system more modular, to allow students to focus on weaker areas without repeating an entire year; new study results will reveal if this is going in the right direction. Dr Jouni Välijärvi (Finland) mentioned that in his country, it was found that students generally advanced very little during a repeat year, sometimes regressing.

Dr Hegarty thanked presenters for their instructive examples of evidence-based educational reform.

2010 UIS Initiative

Dr Alcyone Vasconcelos, UNESCO Institute of Statistics (UIS), spoke about a new UIS initiative, the Assessment of Learning Outcomes Clearinghouse (ALO-c). She clarified that ALO-c arises from a UIS mandate to collect data and generate statistics on education with international comparability. The clearinghouse aims to collect statistics about learning levels of children, in order to answer three questions: (i) what are countries doing to monitor student achievement? (ii) how are countries assessing learning outcomes? (iii) what are countries doing with the results of assessments of learning outcomes? She stated that ALO-c will create a catalogue of existing indicators without restriction on comparability, academic subjects, approaches, grades, or sources, and it will also inventory practices and approaches to measuring learning outcomes within countries, with the eventual goal of comparability. The initiative aims to offer countries appraisals when requested (for instance, if discrepancies in indicators are identified). Prospective partners for this initiative could include international development banks, aid agencies, partners to collect data (like IEA and OECD), and others. By the end of 2010, the ALO-c team will define the structure of the database, establish terms of reference for data-gathering partners, and finish preparations for the pilot (planned for the first half of 2011 in 5–10% of countries). Phase I of the project is scheduled for July–December 2011 involving 10–20% of countries.

Mr Claude Sauvageot (France) asked about the aim of the project. Dr Vasconcelos explained that the main goal is to achieve comparability of learning outcomes across countries. Dr Tom Loveless (United States) raised an issue of standards of evidence and suggested applying resources towards expanding quality indicators to those countries that cannot afford them, rather than collecting existing indicators that may not be sound enough for decision-making. Dr Vasconcelos stressed that once all indicators are gathered and compared “side-by-side,” this will facilitate requests from countries for appraisals of their quality. Dr Wagemaker stated that IEA already collects information on indicators for its encyclopedias, and so this kind of information is well-documented for participating countries.

Dr Hegarty thanked Dr Vasconcelos for her presentation of the challenging UIS agenda.

16:00 – 17:00 Session VIII***Linking TIMSS to National Assessments***

Ms Valena Plisko, National Center for Education Statistics (NCES, United States), spoke about linking subnational and international assessment data. She began by describing assessment contexts in the United States. The 2001 *No Child Left Behind* policy mandates that states administer their own assessments in reading and mathematics at certain grades, allowing for within-state comparison. States further participate in the National Assessment of Educational Progress (NAEP), but there is also state-level interest in international benchmarking, especially in TIMSS since in the “race to the top,” children are seen as participating in the global job market. This raises two main questions: (i) how can state interest in TIMSS be supported without dramatically increasing the burden to schools and students and cost to states? (ii) how can existing data collections be leveraged?

Ms Plisko presented the planned NAEP-TIMSS 2011 linking study at Grade 8, in which NAEP scores will be placed on the TIMSS mathematics and science scales to permit comparisons between states and TIMSS participating countries. A validation study for this project will be conducted in eight states selected on the basis of their prior NAEP performance (ensuring that both ends of the NAEP achievement range are represented as a test of the linking function), prior participation in TIMSS (for trend comparison), and geographical representation. An expert panel, supported by NCES, compared NAEP against international assessments like TIMSS, PIRLS, and PISA, and it was found that NAEP 2005/2007 and TIMSS 2007 have a number of similarities that are helpful for drawing a linking study: both assess mathematics and science achievement at Grade 8, have similar testing time periods and curricular focuses, and have consistent frameworks and trend results. Notable differences between the studies include the organization of the science frameworks, definition of the cognitive dimensions in mathematics/science, topical emphasis, and percentage of multiple-choice items. NAEP also has much larger school and student sample sizes, due to the need for reporting at the state (and sometimes district) level. For the linking study, samples will be selected independently of the main study samples (about 10,000 and 11,000 additional Grade 8 students in the linking/validation components of NAEP and TIMSS, respectively), and consistency in the scoring, training, and quality control procedures will be assured. Under this design, ‘braided’ test booklets containing Grade 8 items from both NAEP and TIMSS will be administered during the NAEP and TIMSS data collections. The same student will take both NAEP and TIMSS items, allowing for a more robust link. There will also be a strong link at the student level for TIMSS, since one intact classroom will receive regular TIMSS booklets and one braided booklets within the same school.

Mr Pierre Brochu (Canada) asked about the United States’ participation in TIMSS at the state level, and Dr Alcyone Vasconcelos (UIS) and Mr Michael Lückl (Austria) asked about federal support/responsibilities for the linking study. Ms Plisko responded that the linking study aims to provide states with international benchmarks without incurring the cost of fully administering TIMSS at the state level. The costs of the eight states’ participation in TIMSS will be paid at the federal level. These states will receive real data, but all states will receive projected TIMSS scores based on the linking function. Dr Georgia Kontogiannopoulou-Polydorides (Greece) asked about future plans for participation, and Ms Plisko answered that NCES aims to continue participating in TIMSS at the national and—to the extent possible—subnational levels.

Dr Hegarty thanked Ms Plisko for the clear presentation and valuable information on the United States’ approach to subnational score estimation.

WEDNESDAY, 6 OCTOBER 2010**09:30 – 10:30 Session IX*****Feedback from Discussion Groups***

Group 1 *Chair:* John Ainley (Australia), *Rapporteur:* Serara Moahi (Botswana)
Participants: Hélder Diniz de Sousa (Portugal), Jur Hartenberg (IEA Secretariat), Michael Lückl (Austria), Sarah Maughan (NFER, United Kingdom), Rosario Sánchez Núñez-Arenas (Spain), Jack Schwille (TEDS-M), Heiko Sibberns (IEA DPC), Jouni Välijärvi (Finland).

Dr Moahi reported a number of discussion points on the (i) benefits, (ii) approaches, (iii) practical implications, and (iv) funding opportunities for an IEA pre-primary education study. She began by listing some of the related projects and programs in countries represented in the group. Members noted that an international study in this area could provide several benefits, including an extensive knowledge base on the nature and provision of pre-primary education across countries; this would promote the exchange of best practice, inform new programs and initiatives, and highlight the importance of educator skills at the pre-primary level. Questions were raised about the appropriate approach to the study, including its focus (should it be on outcomes or processes? children's well-being or learning?), target population (pre-primary grade vs. age), sampling (institution-based?), and type (cross-sectional vs. longitudinal). Practical considerations included issues of instrument development (such as the translation of the test for young children) and administration (individualized). Discussants suggested exploring a variety of funding sources (e.g., NGOs, ministries). Some possible new fields for IEA study were also considered: economics education (possibly as part of ICCS), soft skills/21st century skills, technical computer skills, and technical vocational education.

Group 2 *Chair:* Anu Toots (Estonia), *Rapporteur:* Frederick Leung (Hong Kong SAR)
Participants: Tynyshkul Amreyeva (Kazakhstan), Zhanat Bazarbekova (National Center for Assessment of the Quality of Education, Kazakhstan), Pierre Brochu (Canada), Janez Justin (Slovenia), Anne-Berit Kavli (Norway), Georgia Kontogiannopoulou-Polydorides (Greece).

Dr Leung summarized a group discussion focused on the feasibility and attractiveness of a study on pre-primary education, as well as other new study topics. With respect to pre-primary education, group members raised questions about who should be studied, the kind of achievement to be assessed, and how it would be measured. Some members noted that while it could be interesting to explore differences in achievement at such an early age, there may be difficulties in comparability, as countries differ greatly in the percentage cohort enrolled in preschool education. Dr Leung also reported some methodological and political concerns regarding the testing and ranking of young children. Variations were explored, such as focusing on pre-primary teachers, curricula, or children's ability rather than knowledge. Possible other topics for future IEA study include: (i) tertiary education/transition from secondary to tertiary education, (ii) extending ICILS to Grade 4, and (iii) computer-based testing (as a regional module if not possible internationally).

Group 3 *Chair:* Claude Sauvageot (France), *Rapporteur:* Paul van Oijen (The Netherlands)
Participants: Júlíus Björnsson (Iceland), Frank Goldhammer (DIPF, Germany), Andris Kangro (Latvia), Lubomir Martinec (Czech Republic), Vijay Reddy (South Africa).

Dr van Oijen noted that although many countries recognize the importance of learning in the pre-primary period, there are no curricula, and participation in pre-primary education is very low in some parts of the world. On the basis of group members' experiences, several examples of projects were considered, such as a study of the transition from pre-primary to primary education; activities aiming to identify at-risk children (focusing on

prediction rather than achievement); a study of indicators of children's social, physical, emotional, and cognitive characteristics; a longitudinal monitoring system for identifying children below the development curve; a field experiment on language improvement programs; a parent survey on child well-being in the pre-primary and primary years; studies using group observations and progress reports by teachers; and a study on home influences. Discussants concluded that despite this variety, there is a gap in the study of effective pre-primary schools; however, they did not consider the pre-primary period appropriate for cross-national comparison of achievement. Other possible topics for IEA study include vocational technical education, geographical competence, capabilities at the end of secondary education, and physical education.

Group 4 Chair: Chew Leng Poon (Singapore), *Rapporteur:* Tom Loveless (United States)
Participants: Amina Kafai (Luxembourg), Romana Kanovská (Slovak Republic), Per Lindblad Johansen (Denmark), Leen Vandeputte (Belgium-Flemish).

Dr Loveless presented a number of suggested topics for future IEA study on behalf of the group. Members started from the question of whether new IEA studies are really needed and agreed that, when suggesting new projects, it is important to take into account the full range of studies offered by IEA and other organizations. One suggested approach was to expand existing IEA studies, for instance by making TIMSS more adaptive (offering a "postTIMSS" to measure higher performers in mathematics) or by developing innovative ways to convey results to schools and teachers. Other possible topics include: unpacking the domain of study (such as focusing on student proficiency in algebra at the secondary level); non-cognitive aspects of learning mathematics (student engagement, attitudes, applications, creativity); curriculum analysis (though challenges in comparability were noted); language proficiency and readiness for primary school; out-of-school influences on student achievement; oral language (in contrast to print literacy); and school leadership (a study of head teachers and principals).

Dr Hegarty thanked members of the discussion groups for providing much "food for thought" on the many possibilities and challenges for a pre-primary education study, other possible topics for future IEA study, and ways to expand existing studies.

TIMSS Advanced 2008 Final Report (GA-51/I/09)

The Trends in International Mathematics and Science Study (TIMSS) Advanced 2008 Final Report was given by Co-Directors Dr Michael Martin and Dr Ina Mullis, both of Boston College. Dr Mullis presented the report.

Dr Mullis informed members that TIMSS Advanced was completed in December 2009 with the release of the international report⁶ at a press conference at the University of Oslo, Norway, as well as the publication on the web of the technical report and international database and user guide. She stated that the study addresses the key policy issue of "yield": how many students can be educated to a high level? In the ten participating countries, the study assessed carefully defined populations of final-year secondary school students enrolled in courses in advanced mathematics (algebra, calculus, and geometry) and/or physics (mechanics, electricity and magnetism, heat and temperature, atomic and nuclear physics).

Dr Mullis summarized the major results of TIMSS Advanced. She noted considerable variation in the coverage index (defined as the percentage of students of the entire age cohort that are enrolled in these courses), particularly for advanced mathematics where coverage ranged from 40.5% in Slovenia to just 1.4% and 0.7% in the Russian Federation and the Philippines, respectively. Dr Mullis described the advanced, high, and intermediate benchmarks for both subjects. In advanced mathematics, males had higher average achievement than females in half of the countries; trend results showed significant declines in average achievement in three of the four trend countries, as well

⁶ Mullis, I.V.S., Martin, M.O., Robitaille, D.F., & Foy, P. (2009). *TIMSS Advanced 2008 international report*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center.

as some declines in enrollment. Results for physics showed generally greater gender imbalances, with significantly higher percentages of male physics students in most countries, as well as higher average achievement for males in about half. Trend results for physics also suggest declines in achievement and enrollment. Dr Mullis noted that one of the most striking results is the high percentage of students with teachers aged 50 years or older in many countries. When students were asked about their intended area of continuing education, the most popular choice was engineering, followed by business and health science, not teaching. Dr Mullis said that these results raise concerns about declines in yield and the dwindling supply of teachers in advanced mathematics and physics. **The next cycle of TIMSS Advanced is planned for 2015, in conjunction with the regular cycle of TIMSS.**

Dr Serara Moahi (Botswana) and Dr Vijay Reddy (South Africa) both commented on the challenging issue of teacher shortages, with Dr Reddy asking whether the schooling system should be expected to provide training to 'bridge' for higher level skills. Dr Mullis responded that across some universities, there are concerns about increasing the teaching burden with curricular content that is expected to have been covered in secondary school. Dr Tom Loveless (United States) observed that in the United States, some policy interventions have been attempted, such as lowering barriers to entry (offering shorter, more intense teacher training programs for mid-career changes) and offering pay differentials to attract individuals with advanced mathematics or science degrees. Mr Claude Sauvageot (France) emphasized that any discussion about promoting students into teaching must also consider the public policies in place for supporting the public and research sectors and ensuring the availability of jobs in these areas. Dr Paul van Oijen (The Netherlands) noted that it is not an easy solution trying to attract engineers or other highly educated persons into teaching, and there have been some varied successes in The Netherlands. Dr Frederick Leung (Hong Kong SAR) suggested the International Commission on Mathematical Instruction (ICMI) as a possible resource for information on the secondary-university and university-teaching transitions.

Dr Hegarty thanked the TIMSS Advanced study team for their work on these important issues.

11:00 – 12:15 Session X

Impact of TIMSS Advanced in Norway

Ms Anne-Berit Kavli (Norway) set the context of her presentation on lessons from TIMSS Advanced 2008 for Norway, indicating that the national quality assessment system was developed after the release of PISA 2000 results, which were considered disappointing for Norway. Currently, students undergo regular testing (including a compulsory survey on their learning environments), and results are provided directly to schools; there are also many research-based evaluation programs to improve teaching. Ms Kavli summarized Norway's participation in a number of international assessments, noting that they have provided valuable insights for international comparisons, as well as for measuring trends over time (for which the national tests are not designed). She also emphasized that the national testing system has benefitted from the expertise gained through international studies. The TIMSS Advanced results for Norway showed an overall decline in achievement in advanced mathematics and physics since TIMSS 1995, as well as in enrollment percentages. There was also a relatively low proportion of students scoring at the advanced benchmark, suggesting that the most advanced students are not being stimulated enough. Ms Kavli discussed some results for domains within subjects and presented a sample mathematics item on differentiation to demonstrate the decline in achievement (40% of students answered it correctly in TIMSS 1995, compared with about 20% in 2008). One of the most important lessons from TIMSS Advanced was that Norwegian classrooms showed little variation in learning strategies. Teachers commonly spent more time addressing new material rather than on repetition (reviewing homework, practicing skills). She noted that the higher calculator use seemed to confirm the concern

that students lack some automated skills. Exams in mathematics and physics have been modified in an attempt to improve these basic skills (one part of the exam allows calculator use, one does not). Another concern, like in other TIMSS Advanced countries, was the relatively high percentage of students with teachers nearing retirement and the low percentage of students planning to continue their education in advanced mathematics or physics. In general, the Norwegian results have confirmed the need for a greater focus on basic skills, and generated discussions on how to improve achievement levels in advanced mathematics and physics, as well as interest in conducting comparisons with other countries like Slovenia (which has a much higher coverage index) and Sweden. Ms Kavli expressed the hope that more countries will take part in TIMSS Advanced in 2015 to further increase the study's relevance, importance, and opportunity for international comparison.

Dr Paul van Oijen (The Netherlands) asked about the program for improving basic skills. Ms Kavli responded that one important focus of the program is algebra, as it has not been a subject of national testing. National centers were formed around basic school subjects like science and foreign language, providing teaching materials and resources. Mr Pierre Brochu (Canada) commented that one might expect to find a rise in selectivity and outcomes accompanying a decline in enrollment, but this does not seem to be the case. He asked whether this could be due to lower numbers of students overall. Ms Kavli explained that there was not a large decline in the number of pupils and in addition, the selectivity did not increase much because advanced mathematics is required in some types of tertiary education programs. Dr Jouni Välijärvi (Finland) asked about strategies for investing in teacher education. Ms Kavli said that there has been a heavy focus on teacher education in recent years, but mainly in primary and lower secondary teaching. At the upper secondary level, many teachers have higher academic subject and pedagogy degrees. It is a challenging issue because those with advanced degrees in mathematics/physics have many options, and teaching salaries are not as competitive as in other fields. Ms Leen Vandeputte (Belgium-Flemish) asked about the reporting of results to schools. Ms Kavli explained that results of national testing at the school level are provided to school officials, and may also be made public after the students graduate, provided there are enough pupils to ensure anonymity.

Dr Hegarty thanked Ms Kavli for her informative presentation.

Announcement of 2011 General Assembly

Dr Hegarty announced that the 52nd IEA General Assembly meeting will be hosted by the Educational Research Centre in Dublin, Ireland on 10–13 October 2011. He extended the invitation on behalf of the center's Acting Director Dr Peter Archer (Ireland), who was unable to attend this year's meeting, and noted that it came with the full support of the Department of Education and Skills and the Inspectorate in Ireland.

Closing Remarks

Dr Hegarty thanked all presenters and participants for their thoughtful contributions to the meeting. He extended special appreciation to Dr Serara Moahi (Botswana) and her colleagues from the Botswana Examinations Council for graciously hosting the meeting, and to study coordinators, committee members, the IEA Secretariat, the IEA DPC, and Dr Wagemaker for their significant involvement, support, and expertise in keeping IEA at the forefront of large-scale educational assessment.

The meeting was adjourned at 12:15.