



International Commission on Mathematical Instruction

Report on ICMI activities in 2004-2008¹

1. Organisation

A new **Executive Committee (EC)** of the International Commission on Mathematical Instruction (ICMI) was elected at the General Assembly of the International Mathematical Union (IMU) held in Santiago de Compostela (Spain) in August 2006 and has taken charge as of January 1, 2007. Among the members of the previous Executive Committee, three were re-elected: Professor Michèle Artigue becoming President, Professor Jill Adler being re-elected as Vice-President and Professor Bernard R. Hodgson as Secretary-General. The incoming members of the 2007-2009 Executive Committee of ICMI are: Professor William (Bill) Barton as Vice-President and Professors Maria G. (Mariolina) Bartolini Bussi, Jaime Carvalho e Silva, Celia Hoyles, S. Kumaresan and Alexei L. Semenov as Members-at-Large. The Terms of Reference of ICMI allowing the co-option of up to two additional members on the EC “in order to provide for missing coverage or representation”, Frederick Koon-Shing Leung (Hong Kong) was later co-opted as an additional member of the EC, thus making him a member of the Executive Committee for a second consecutive term. The Past ICMI President, Hyman Bass, as well as the President and Secretary of IMU, László Lovász and Martin Grötschel, are *ex officio* members of the 2007-2009 ICMI EC. The new Executive Committee expressed its sincere thanks to the outgoing members of the previous EC: Professors Carmen Batanero, Maria Falk de Losada, Nikolai Dolbilin, Peter L. Galbraith and Petar S. Kenderov (Members-at-Large), and John M. Ball and Phillip Griffiths (*ex officio*).

During the period covered by this quadrennial report, the 2003-2006 Executive Committee of ICMI had **meetings** on the following dates:

- February 11-12, 2004, in Dortmund, Germany, on the occasion of the Study Conference for ICMI Study 14

¹ This report appears in the *ICMI Bulletin* No. 62 (June 2008).

- July 2-4, 2004 — with the participation of John Ball, President of the International Mathematical Union —, as well as on July 11, on the occasion of ICME-10 held in Copenhagen, Denmark, during the ICME-10 congress
- June 19-22, 2005, at the University of the Witwatersrand in Johannesburg, South Africa, just prior to the First Africa Regional Congress of ICMI
- December 15-18, 2005, at the Indira Gandhi National Open University in New Delhi, India — a National Conference on Mathematics Education was held at the National Council of Educational Research and Training (NCERT), in New Delhi, in conjunction with the ICMI EC visit
- November 18-21, 2006 in Cartagena de las Indias, Colombia, for the sixth and final meeting of that EC mainly devoted to the preparation of the transition to the next ICMI EC — on the occasion of their visit to Colombia, the members of the ICMI EC took part in a Forum on the theme “Mathematical Competencies in Higher Education” organized by the Colombian Ministry of Higher Education on November 22-24 in Bogotá.

The new (2007-2009) Executive Committee of ICMI has its first meeting at the London Knowledge Lab (London, UK) on June 13-16, 2007, with the participation of the newly elected President of the International Mathematical Union (IMU), László Lovász. As this was the first face-to-face session of all the members of this EC, the meeting was launched by a discussion of the mission of ICMI. Themes that were mentioned included: the importance of retaining strong links with the mother organisation of ICMI, the IMU; the international nature of ICMI and a recognition of different challenges in different countries; the importance of the “Pipeline” project (see item 7 below); the need to work on a regional basis; the value of ICMI Studies; and the need to establish sound administrative and financial foundations for the organisation. The second meeting of the 2007-2009 EC took place in Rome on March 4 and 9, 2008, on the occasion of the symposium celebrating the Centennial of the Commission. This meeting was also partially attended by the President of the IMU, László Lovász, and by IMU Vice-President Claudio Procesi. Besides these meetings, the work of the ECs during the period covered in this report was conducted by electronic communication under the direction of the Presidents and the Secretary-General.

As the workload incumbent to the Executive has considerably increased in recent years, the two ICMI ECs have made substantial efforts concerning personal responsibilities of their members and towards a greater sharing of the duties among the committee.

Throughout the years covered in this report, the President and Secretary-General of ICMI have been in regular email contact with the President and Secretary of IMU on various issues related to ICMI. In order to facilitate direct contacts between the Executive Committees of the two organisations and as part of the decisions concerning the distribution of responsibilities among its members, the Executive Committee of IMU has appointed one of its members, Victor A. Vassiliev, to be the **IMU Representative for ICMI** for the period 2004-2006, and both Cheryl Praeger and Victor A. Vassiliev for the period 2007-2010. The IMU Representatives are invited to attend the ICMI Executive meetings, but the President and Secretary of IMU remain ex officio members of the ICMI EC. Moreover the President and Secretary-General of ICMI were invited for part of the meeting of the **Executive Committee of IMU** held in Rio de Janeiro on April 22, 2005. In addition to allowing the IMU EC members to receive a report on ICMI and its activities, this meeting was the occasion for discussing specific issues such as the difficult

financial situation of ICMI and the possible collaboration of ICMI to IMU initiative towards developing countries. It also allowed to examine concerns expressed by the IMU EC about the situation of students of mathematics at the university level and to identify a joint action of IMU and ICMI on this matter, the so-called “Pipeline” project (see item 7 below).

Since the last General Assembly of ICMI, held at ICME-10 in Copenhagen on July 9, 2004, there have been a certain number of changes in the **ICMI membership**. Two countries that were already members of ICMI, *Indonesia* and *Pakistan*, have been admitted to IMU as of January 1, 2005. Moreover *Ecuador* and *Kyrgyzstan* have acquired in 2007 the status, newly created at the 2006 General Assembly of IMU, of “Associate members” of IMU — in contrast to ordinary membership, this new type of membership does not need independent scientific activity, but it is assumed that IMU Associate member is determined to develop its mathematical landscape and has the will to become an IMU member after four to eight years of associate membership. Contacts with the two Associate members have been established and they were invited to appoint a Representative to ICMI. During 2007, as a consequence of the end of the union between the republics of Serbia and of Montenegro, the corresponding membership in the IMU (and thus in ICMI) was changed from *Serbia and Montenegro* to *Serbia*. Finally, as of January 1, 2008, *Colombia*, became a member of IMU. The number of countries members of ICMI at the time of this report is thus 84, including 14 countries that are not members of IMU.

Out of these 84 countries, 13 had no appointed **Representative to ICMI**: *Bosnia and Herzegovina, Brunei Darussalam, Colombia, Ghana, Kazakhstan, Kuwait, Kyrgyzstan, Pakistan, Peru, Saudi Arabia, Turkey, Uruguay* and *Zambia*. Among the remaining 71 countries, there were 5 where the ICMI Representative could not be reached by email: *Bangladesh, Botswana, Costa Rica, Malawi* and *Swaziland* — a rather negative signal as regards the level of activity of the Representative from that country. All this represents a substantial improvement since 2003 and the efforts launched at that time by the ICMI Executive Committee in order to reinforce the links and improve communication between ICMI and its member countries, each EC member being directly responsible for a few countries, have begun to bear fruits. Over the last four years, 42 new ICMI Representatives have been appointed, which is definitely a very positive outcome, especially considering the important role to be played from 2008 onwards by the ICMI General Assembly in the election of the ICMI Executive Committee. Nevertheless, more than 15 representatives have been appointed more than a decade ago, which does not respect Resolution 5 adopted by the 1990 General Assembly of the IMU held in Kobe, Japan, and stipulating that “*All Adhering Organizations are reminded that they should review their national representation on ICMI and that normally national representatives should not be asked to serve for more than two consecutive four-year terms*”.

The new ICMI Executive has resumed the discussion launched by the previous EC about the possibility of asking **dues** from the members of ICMI that are not members of IMU. Besides a basic issue of equity of treatment, this matter is connected both to the outreach aims of ICMI, in particular as regards non-affluent countries, as well as to the difficulties in maintaining a stable and reliable database as regards the official links with the non-IMU members of ICMI. This question has been raised explicitly for consideration by ICMI by the IMU, which collects the funds it gives to ICMI mainly through the dues paid by its members. The discussion is still ongoing.

During the period 2004-2007, an average of about fifteen **collective e-mail messages** were sent every year by the Secretary-General to the ICMI Representatives. Most of these messages provided general information on ICMI and its activities and were intended for further dissemination within each country. But others were giving information more specific to the ICMI representatives (vg in preparation for the ICMI General Assembly held during ICME-10 and ICME-11) or asking for input from the representatives.

As reported in the 2000-2004 Report of Activities (see *ICMI Bulletin* No. 54, June 2004, pp. 32-48), the IMU Executive Committee had received from the 2002 General Assembly the mandate to make more transparent the whole **election procedures** for the various elected committees of IMU and to avoid the potential for conflicts of interest in the procedure of selection of slates. In response to the resolution adopted to that effect by the IMU GA, proposals for new rules of appointment of the Nominating Committee for the ICMI election were drafted by the IMU EC and sent to the ICMI EC during 2003. The ICMI EC concluded that these proposals of IMU did not pay sufficient attention to the specificity of ICMI and were *de facto* moving away from a context where the ICMI community could play a significant role in the selection of its governing body. Discussions on this issue were pursued in 2003 and early 2004, and finalised during the meeting of the ICMI Executive Committee held just prior to ICME-10 — this allowed for an announcement to be made at the General Assembly of ICMI, held during ICME-10 in Copenhagen, about the procedure agreed by the IMU and ICMI ECs. A major effect of this change, which is quite historic for ICMI, is that the actual election of the ICMI EC will be in the hands of the ICMI GA, starting with the 2008 GA to be held during ICME-11. However any future amendments to the proposed procedure will still be under the jurisdiction of the GA of IMU. A first report on the new election procedure for ICMI, which then still needed to be approved by the IMU General Assembly to be held in Santiago de Compostela, Spain, in August 2006, just prior to the ICM, can be found in the *ICMI Bulletin* No. 55, December 2004, pp. 18-22.

Part of the 2004 agreement (see under “Transition Process”, p. 22 in the *ICMI Bulletin* No. 55, December 2004) was that the new election process would be used for the **2006 election**, but necessarily on an informal basis (pending approval of the new proposed procedures and structures at the 2006 IMU General Assembly). Consequently a *Nominating Committee of ICMI* was set up for the 2006 election, with a mandate to prepare the selection of the slate of candidates for the ICMI Executive Committee, but operating informally as an advisory body to the IMU Executive Committee. A call for nomination of candidates to the ICMI Nominating Committee was made in October 2004 to the IMU Adhering Organisations and Committees for Mathematics as well as to the ICMI Representatives. This Nominating Committee was composed of Mogens Niss (Chair), John Ball, Hyman Bass, Victor Vassiliev, Tomas Recio, Günter Törner and Lim-Teo Suat Khoh. A call for nomination of candidates to the 2007-2009 ICMI Executive Committee was made in August 2005 to the IMU Adhering Organisations and Committees for Mathematics as well as to the ICMI Representatives. The Chair of the ICMI Nominating Committee for the 2006 election attended the IMU General Assembly in order to present the slate of candidates proposed by the Committee. This slate appears in the *ICMI Bulletin* No. 58, June 2006, and the results of the elections in the December 2006 issue (No. 59).

Following the agreement made in 2000 with the IMU EC, the President and Secretary-General of ICMI were invited as *ex officio observers* to the 2006 General Assembly of IMU. This allowed them to present to the delegates the principles and detailed content of the new procedure for the election of the Executive Committee of ICMI as agreed upon by the IMU and ICMI ECs in 2004 and fine-tuned in 2006, in particular as regards the fact that this election will from now on take place at the General Assembly of ICMI. The new procedure provoked some discussion during the meeting but was finally adopted by the IMU Assembly. A report on that matter appears in the *ICMI Bulletin* No. 59, December 2006.

Due to the short delay between the adoption of the new election rules for the ICMI EC at the 2006 IMU GA and the deadlines for submission of candidatures for the **2008 election**, the invitation to the IMU Adhering Organisations, Committees for Mathematics, and ICMI Representatives, to nominate candidates to the *Nominating Committee of ICMI* to be set up for the 2008 election and to the 2010-2012 ICMI Executive Committee itself, was exceptionally made in the same email call, sent in January 2007. This 2008 ICMI Nominating Committee was originally composed of Jeremy Kilpatrick (USA), chair, Michèle Artigue (France), László Lovász (Hungary), Attia Ashour (Egypt), Lee Peng Yee (Singapore), Elon Lima (Brazil) and Evgenia Sendova (Bulgaria). But Elon Lima later withdrew from the Committee. The Nominating Committee slate will be presented by the Chair of the ICMI Nominating Committee at the ICMI General Assembly to be held in July 2008. It is found elsewhere in this issue of the *ICMI Bulletin*.

During the 2006 final discussions about the new election procedures, a clause was introduced stipulating, in accordance with the IMU tradition, that the President of ICMI should serve for only one term (plus a term as Past President). The **Terms of Reference** of ICMI have been amended by the IMU Executive Committee in February 2007, so the reflect both the fact that the ICMI EC is henceforth elected by the ICMI General Assembly (instead of the IMU GA) and that the term as President of ICMI is becoming non-renewable.

During 2004, the ICMI community was saddened by the sudden decease on April 14 of **Miguel de Guzmán**, former President of ICMI (1991-1998). Also former Executive Committee members Igor Sharygin (1999-2002), Hans-Georg Steiner (1975-78) and Jacobus H. van Lint (1987-1994) passed away in 2004. *In memoriam* testimonies were respectively published in the *ICMI Bulletin* No. 54, June 2004, pp. 70-81, and No. 55, December 2004, pp. 67-84.

2. Finances

In accordance with its Terms of Reference, ICMI files every year a **financial report** for the endorsement of the IMU. These annual reports on ICMI accounts are published yearly in the *ICMI Bulletin*. A summary of the financial situation of ICMI for the years 2004-2008 appears elsewhere in this issue of the *Bulletin*.

Since the transition of the ICMI secretariat to Québec, in 1999, ICMI assets have been deposited in two **bank accounts** at the Caisse populaire Desjardins de l'Université Laval, Cité universitaire, Québec (account No. 68 033, in CAD, and account No. 800 394, in USD). Moreover in 2007, considering the assets already available in Canadian and US dollars and the important fluctuation

of various currencies, it was felt appropriate to have the 2007 annual grant of IMU transferred to ICMI in euros. A third bank account, in EUR, was thus opened during 2007 at the HSBC Bank of Canada, 2795 boul. Laurier, Québec (account no. 23-0126-X).

3. ICMEs

The 10th International Congress on Mathematical Education, **ICME-10**, was held at the Technical University of Denmark (DTU) in Copenhagen, Denmark, from July 4 to 11, 2004. This congress was organised through a collaboration of neighbouring countries (the Nordic countries Denmark, Finland, Iceland, Norway, Sweden), a first in the life of ICMI. The congress ICME-10 was attended by 2394 participants from 94 different countries. There were also 389 accompanying persons or exhibitors. The International Program Committee, chaired by Professor Mogens Niss, Roskilde University, had proposed a rich and intensive scientific programme, some components of which — such as the Plenary Interview Session or the five so-called Survey Teams — were highly innovative and very well received. The infrastructure and logistic support offered by the organizers were of excellent quality. The tradition instigated at ICME-8 of imposing a “Solidarity Tax” on all registrations was repeated at ICME-10. It had been announced in the Second Announcement of the congress that an ICME-10 Solidarity Fund would be established to provide support to participants from non-affluent countries by setting aside 10% all the registrations fees. The organisers of ICME-10 finally distributed more than 11% of the registrations fees, thus allowing them to provide support to 175 participants coming from 55 different countries. The distribution of the money generated for the Fund was made by a Grants Committee, jointly appointed by the congress organisers and the ICMI Executive Committee, which worked autonomously and anonymously, as is customary, in order to minimize potential problems of pressure. During the closing session of ICME-10, the ICMI Executive Committee expressed its gratitude and appreciation to four Nordic colleagues who played key leadership roles towards the success of the congress: the Chair of the Nordic Contact Committee, Professor Gerd Brandell; the Administrative Secretary to the Local Organising Committee and to the International Programme Committee, Ms. Elin Emborg; the Chair of the Local Organising Committee, Professor Morten Blomhøj; and finally the Chair of the International Programme Committee and in many ways the heart of the ICME-10 adventure, Professor Mogens Niss. Progress on the Proceedings of ICME-10 has been delayed due to health problems of a key member of the editorial team, so that the publication is expected to take place just prior to ICME-11. Information about ICME-10 is still available on the website <http://www.icme10.dk/>

The next International Congress on Mathematical Education, **ICME-11**, will be held on the campus of the Universidad Autónoma de Nuevo León (UANL) in Monterrey, México, from July 6 to 13, 2008. The International Program Committee is chaired by Professor Marcela Santillán, Rectora at the Universidad Pedagógica Nacional in México, and the Local Organising Committee by Professor Carlos Signoret, Head of the Department of Mathematics at the Universidad Autónoma Metropolitana — Iztapalapa in México. The local preparation of ICME-11 benefits from the strong support of the Sociedad Matemática Mexicana. The composition of the IPC was finalised early in 2005 and is announced in the June 2005, No. 56, issue of the *ICMI Bulletin*. The IPC had its first meeting in Mexico City in 2005, from October 29 to November 1st. One member of the Committee was denied entrance to Mexico on that occasion, and the President of

ICMI wrote to the Mexican Secretary of State to ensure that such a dismissal would not happen again in connection with ICME-11. The case was also referred, in collaboration with IMU, to the Committee on Freedom and Responsibility in the Conduct of Science (CFRCS) of the International Council for Science (ICSU). The second and final meeting of the IPC took place in Monterrey on January 27-30, 2007. Following the tradition started at ICME-8, in 1996, the organisers have adhered to the general policy of ICMI of forming a solidarity fund established by setting aside 10% of the registrations fees for grants. These grants aim at facilitating a balanced representation from all over the world, among presenters as well as among general participants, by assisting delegates from non-affluent countries to attend the congress. Up-to-date information about ICME-11 is available on the website <http://icme11.org/>.

An official call for bids to host **ICME-12** in 2012 was made by the Secretary-General of ICMI during the closing session of ICME-10. This call also appears in the *ICMI Bulletin* (No. 55, December 2004, pp. 11-12). Three countries, namely (in alphabetical order) China, Korea and South Africa, first responded in 2005 to the invitation of informing the ICMI Executive Committee by a declaration of intent that they were considering preparing a proposal to host ICME-12, and finally submitted official bids by the deadline of November 2006. The Executive Committee has organised site visits to the three countries early in 2007, the ICMI visiting committee being composed of President Michèle Artigue, Vice-President Bill Barton and Secretary-General Bernard R. Hodgson. The visits took place in March 2007 (Shanghai and Seoul) and May 2007 (Durban) and allowed the Executive Committee to appreciate the quality of the local infrastructure, the support the project was receiving in the country as well as the expertise of the organising team. The bids were thoroughly discussed by the ICMI EC at its meeting in London in June 2007, which led to requests for additional pieces of information from the bidding countries. The final decision was made by the EC through an email discussion that took place between October and December 2007. The high quality of the three proposed bids made the EC decision task especially difficult. The ICMI Executive Committee announced by the end of 2007 its decision of accepting the invitation from Korea to host ICME-12 in 2012. The congress is expected to take place in the COEX Convention Centre, in Seoul, on July 8-15, 2012. A Korean delegation will be present at ICME-11 to provide information on the 2012 ICME.

The ICMI Executive Committee has expressed its deepest gratitude to the mathematics education and mathematics communities in the three bidding countries, and especially to the three persons who chaired the committees that prepared the bids, namely Professors Jianpan Wang (China), Sung Je Cho (Korea) and Renuka Vithal (South Africa).

As two members of the ICMI EC — namely Vice-President Jill Adler (South Africa) and Member-at-Large Frederick Leung (China / Hong Kong) — are from one of the countries having submitted a bid for ICME-12, a decision had to be made about how to avoid any conflict of interest, or appearances of such conflict. The following two principles were agreed upon by the EC and made known publicly: (i) at no point should an EC member from a bidding country participate in any discussion relating to evaluation of the bids, or have access to information about the competing bids; (ii) no EC member may be a member of the committee that formally presents a bid to ICMI (although an EC member could be involved in the reflection leading to the decision by a country to submit or not a bid).

The book of Proceedings of **ICME-9** has appeared in 2004. The data for the book are: Hiroshi Fujita, Yoshihiko Hashimoto, Bernard R. Hodgson, Peng Yee Lee, Stephen Lerman and Toshio Sawada, editors, *Proceedings of the Ninth International Congress on Mathematical Education*. Kluwer Academic Publishers, 2004. ISBN (HB) 1-4020-8093-X; ISBN (PB) 1-4020-7902-8; ISBN (e-book) 1-4020-7910-9.

The book is accompanied by a CD. However a problem occurred in the production of the CD. It is stated in the Preface of the book (p. xii) that “the CD part of these Proceedings contains, in addition to files for the whole content of the book part, vivid scenes of the ceremonies and the IRT, full texts of regular lectures if available, and some scientific animation etc.” As it turns out the “whole content of the book part” was absent from the accompanying CD, as were the “full texts of the regular lectures if available”. The congress organizers decided to issue a revised and complete version of the CD, to be sent to all ICME-9 participants. The production of the revised version of the CD, originally planned for 2005, met with some delay, but the shipping of the new CD finally took place by the end of June 2006.

4. ICMI Studies

The mounting and conducting of so-called ICMI Studies on crucial themes and issues in mathematics education were continued in the years 2004-2008. As a result of the merger in 2004 of Kluwer Academic Publishers with BertelsmannSpringer, the ICMI Study Volumes published in the “**New ICMI Study Series**” (NISS), under the general editorship of the President and the Secretary-General of ICMI, now appear under the label of Springer.

As reported in the previous quadrennial report, the ICMI EC launched, at its June 2003 meeting, a **reflection on the ICMI Study programme** and its accomplishments since its inception, in the mid 1980s. The Studies being concretely reflected in the Study volumes appearing in the NISS series, the ICMI EC had invited Stephen Lerman (London South Bank University) to review and analyse the research papers published in the NISS Study volumes. The report was received in 2005, suggesting some slight modifications in the overall organisation of the Study programme. After a period of reflection and discussion, the EC finalised at its November 2006 meeting its work on the Lerman report. EC member Peter Galbraith has written on behalf of the Executive Committee a paper summarising the recommendations of the EC on this account for the benefit of co-chairs of future Studies. This document appears in the December 2006 (No. 59) issue of the *ICMI Bulletin*.

During the period 2004-2007, three **new volumes** have appeared in the New ICMI Study Series:

- **ICMI Study 12:** *The Future of the Teaching and Learning of Algebra*
The Study Conference was held in Melbourne, Australia, in December 2001, and the resulting study volume has appeared in 2004; eds: Kaye Stacey, Helen Chick and Margaret Kendal. (NISS 8)
- **ICMI Study 13:** *Mathematics Education in Different Cultural Traditions: A Comparative Study of East-Asia and the West*

The Study Conference was held in Hong Kong in October 2002, and the resulting study volume has appeared in 2006; eds: Klaus-Dieter Graf, Frederick K.S. Leung and Francis Lopez-Real. (NISS 9)

- **ICMI Study 14:** *Applications and Modelling in Mathematics Education*
The Study Conference was held in Dortmund, Germany, in February 2004 (see below), and the resulting study volume, entitled *Modelling and Applications in Mathematics Education: The 14th ICMI Study* has appeared in 2007; eds: Werner Blum, Peter Galbraith, Hans-Wolfgang Hehn and Mogens Niss. (NISS 10)

Reports on these three studies were presented at ICME-10.

Four **Study conferences** have taken place since 2004:

- **ICMI Study 14:** *Applications and Modelling in Mathematics Education*
The Study Conference for the 14th ICMI Study was held at the Universität Dortmund, Germany, on February 13-17, 2004, and was attended by 90 participants coming from 26 different countries. The IPC, whose composition was announced in the *ICMI Bulletin*, No. 49, December 2000, p. 34, was chaired by Werner Blum, Universität Kassel, Germany. Hans-Wolfgang Henn, Universität Dortmund, chaired the Local Organising Committee. The Discussion Document for this Study was published in various journals and newsletters, including the *ICMI Bulletin* No. 51, December 2002, pp. 23-42, *L'Enseignement Mathématique* 49 (2003) pp. 205-214, and in *Educational Studies in Mathematics* 51 (2002) pp. 149-171. The NISS Study volume (NISS 10) has appeared in 2007 (see above).
- **ICMI Study 15:** *The Professional Education and Development of Teachers of Mathematics*
The Discussion Document for this Study was published in various journals and newsletters, including the *ICMI Bulletin* No. 54, June 2004, pp. 12-23, in *L'Enseignement Mathématique* 50 (2004) pp. 191-200 and in *Educational Studies in Mathematics* 56 (2004) pp. 359-372. The Study Conference was held in Águas de Lindóia, São Paulo, Brazil, on May 15-21, 2005, and was attended by 157 participants (including 94 women) from 33 different countries. The NISS volume is currently in preparation under the editorship of the two co-chairs, Deborah Ball (University of Michigan, USA) and Ruhama Even (Weizmann Institute of Science, Israel), and will appear in 2008 (NISS 11).
- **ICMI Study 16:** *Challenging Mathematics in and beyond the Classroom*
The two co-chairs of the International Programme Committee are Peter J. Taylor (University of Canberra, Australia) and Edward J. Barbeau (University of Toronto, Canada). The Discussion Document for this Study appears in particular in the *ICMI Bulletin* No. 55, December 2004, pp. 32-46, in *L'Enseignement Mathématique* 51 (2005) pp. 165-176 and in *Educational Studies in Mathematics* 60 (2005) pp. 125-139. The Study Conference was held at the Norwegian University of Science and Technology, in Trondheim, Norway, on June 27 to July 3, 2006, Ingvill M. Stedøy being the Chair Local Organising Committee. It was attended by 44 participants from 22 different countries. The NISS volume is in preparation under the editorship of the Study co-chairs Edward J. Barbeau and Peter J. Taylor, and will appear in 2008 (NISS 12).
- **ICMI Study 17:** *Digital Technologies and Mathematics Teaching and Learning: Rethinking the Terrain*
The two co-chairs of the International Programme Committee are Celia Hoyles, University of London, UK, and Jean-Baptiste Lagrange, IUFM de Reims, France. The Discussion

Document for this Study appears in the *ICMI Bulletin* No. 57, December 2005, and in *L'Enseignement Mathématique* 51 (2005) pp. 351-363, among others. A short announcement was published in *Educational Studies in Mathematics* 60 (2005) pp. 267-268. The Study Conference was held at Hanoi University of Technology, Viet Nam, on December 3-8, 2006, the Chair of the Local Organising Committee being Le Hung Son. It was attended by 130 participants from 34 different countries, including 36 Vietnamese participants. Moreover it was decided by the local organizers to benefit from this concentration of expertise by organizing a specific workshop associated with the conference and intended for local and regional teachers. The participants to this workshop were offered to attend all the conference activities (plenary lectures, panels, communications and project presentations), except the working group activities more directly devoted to the preparation of the ICMI Study book by the regular conference participants — these group activities were replaced for the workshop participants by three specific laboratory sessions taking place in parallel. The workshop was attended by 44 teachers from Viet Nam, 3 teachers from Cambodia and 2 teachers from Thailand. The Study conference and the workshop were financially supported by the ICMI Solidarity Fund (2 000 USD), IMU Developing Countries Strategy Group — DCSG (5 000 USD) and UNESCO (3 000 USD), as well as by five private sponsors involved in the workshop (9 000 USD altogether). The Study co-chairs Celia Hoyles and Jean-Baptiste Lagrange are responsible for the editorial work on the NISS Study volume (NISS 13). The Study 17 Conference was saddened by a tragic traffic accident to the opening keynote speaker, Seymour Papert, who was severely injured when hit by a motorcycle while crossing a street on his way to Hanoi University of Technology.

Report sessions on ICMI Studies 15, 16 and 17 are on the programme of ICME-11.

Two **other Study Conferences** are soon to take place:

- **ICMI Study 18:** *Statistics Education in School Mathematics: Challenges for Teaching and Teacher Education*

This Study is organised jointly with the International Association for Statistical Education (IASE), and its International Programme Committee, whose composition is announced in the *ICMI Bulletin* No. 57, December 2005, is chaired by Carmen Batanero, Universidad de Granada, Spain. The Local Organising Committee is chaired by Blanca Ruiz, of the Instituto Tecnológico y de Estudios Superiores, Monterrey, México. The Study Conference, which is merged with an IASE Round Table Conference, will take place in Monterrey on June 30-July 4, 2008, at the ITESM, as a satellite conference to ICME-11. The IPC had a meeting on the occasion of the ICOTS-7 conference in Salvador de Bahia, Brazil, in July 2006 and the Discussion Document for the Study has been posted on the Study website by mid-September 2006. It also appears in the *ICMI Bulletin* No. 59, December 2006, in *L'Enseignement Mathématique* 53 (2007) pp. 179-191 and in *ZDM* 38 (2006) pp. 506-516. A short announcement also appears in *Educational Studies in Mathematics* 66:1 (2007) — Back Matter (no page number).

- **ICMI Study 19:** *The Role of Mathematical Reasoning and Proving in Mathematics Education*

The International Programme Committee for the 19th ICMI Study is co-chaired by Gila Hanna (University of Toronto, Canada) and Michael de Villiers, (University of KwaZulu-Natal, South Africa). The IPC, whose composition appears in the *ICMI Bulletin* No. 60 (June 2007),

met at the Universität Duisburg-Essen, Germany, in November 2007. The Discussion Document for this Study, which was posted on the Study website by the end of 2007, appears in various journals and newsletters, including the *ICMI Bulletin* No. 61, December 2007, the January-June 2008 issue of *L'Enseignement Mathématique* (vol 54) and *ZDM* 40 (2008) pp. 329-336. A short announcement was also published in *Educational Studies in Mathematics* 67:2 (2008) — Front Matter (no page number). The Study conference will be hosted by the National Taiwan Normal University, Taipei, Taiwan, on May 10-15, 2009, Fou-Lai Lin chairing the Local Organising Committee.

Two **new ICMI Studies** are now just underway, whose themes have been approved by the ICMI EC in 2007:

- **ICMI Study 20:** *Educational Interfaces between Mathematics and Industry* (provisional title)

A new Study concerned with the educational links between mathematics and the industry is now being launched jointly by ICMI and the International Council for Industrial and Applied Mathematics (ICIAM). Both the Board of ICIAM and the Executive of ICMI have recently approved this joint project and appointed Alain Damlamian (Université Paris XII, France) and Rudolf Sträßer (Justus-Liebig-Universität Gießen, Germany) as co-chairs of the Study. José Francisco Rodrigues (Universidade de Lisboa, Portugal) is the organiser of the Study Conference, which will take place in Portugal. The International Programme Committee is now being appointed and the Study Conference is expected to take place early in 2010.

- **ICMI Study 21:** *(Re)Sourcing the Teaching and Learning of Mathematics in Multilingual Contexts* (provisional title)

The ICMI Executive Committee has also approved the launching of another Study on the issues and challenges of multilingual contexts in mathematics education. The International Programme Committee, chaired by Maria do Carmo Santos Domite (Universidade de São Paulo, Brasil) and Mamokgethi Setati (University of South Africa), is now under appointment. The Study Conference is planned for 2010 as well.

Springer has announced in 2006 a new procedure for obtaining the **ICMI discount** on the books published in the NISS series. This discount of 60 % on all NISS series hardbound volumes and of 25 % discount on all softbound volumes within the series is accessible to individuals when purchasing these books for personal use and through the Springer website. Springer has issued Token Numbers to be entered during the online ordering process.

At its June 2007 meeting, the Executive Committee decided to launch a round of negotiation with Springer so to reach a new agreement as regards the **contract for the NISS series**. Among the objectives to achieve in this new contract is an increase in the royalties (currently at 6 %). But more important is the issue of obtaining permission to post the content of the NISS volumes freely accessible on ICMI website after a delay of a certain number of years after the publication of the book. This is becoming even more important in the context of the ICMI Digital Library reported below (item 11).

The tradition had it that the **royalties on the NISS volumes** were left with the editors of each volume as a token of recognition for the work done in support of the study. At its December 2005 meeting, the ICMI EC decided that from now on, the royalties should be payable to ICMI.

This decision has to be seen in the global context of ICMI difficult financial situation, in particular as regards the costs provoked by the organisation of the studies, and is among the approaches that the EC has identified to help improve the long-term financial health of ICMI

5. ICMI Regional Conferences

Since 2004, the following six **Regional Conferences** were sponsored (financially, morally, or both) by ICMI.

- **AFRICME 1** (the *First Africa Regional Congress of ICMI on Mathematical Education*) was held at the University of the Witwatersrand in Johannesburg, South Africa, on June 22-25, 2005. The conference was attended by some 180 participants from 23 countries, including in particular the following fourteen African countries: Botswana, Burkina-Faso, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Tunisia, Uganda, Zambia and Zimbabwe. The conference was financially supported by ICMI (3 000 USD) and by IMU Commission on Development and Exchanges (CDE). The latter grant of 10 000 USD allowed to provide support for regional delegates as well as support for two participants from Francophone Africa (Tunisia) and India. A report on the conference appears in the *ICMI Bulletin 57* (December 2005).
- **ICMI-EARCOME-3** (*Third ICMI East Asia Regional Conference on Mathematics Education*) was held in China from August 7 to 12, 2005. Three higher teacher education institutes were co-organizers: East China Normal University in Shanghai, Nanjing Normal University in Nanjing City, and Hangzhou Teachers college in Hangzhou City. The conference took place during the first four days on the campus of East China Normal University, in Shanghai. Participants then divided into two groups moving to Nanjing or Hangzhou respectively for the last two days' sessions. There were over 300 participants, with 152 coming from 15 foreign countries of East Asia and around the world. A report on the conference appears in the *ICMI Bulletin 57* (December 2005).
- **EMF 2006** (*Espace mathématique francophone 2006*) took place at the University of Sherbrooke, Québec, Canada, on May 27-31, 2006. It is the third in this series, the first two having been held in Grenoble, France (2000) and Tozeur, Tunisia (2003). The theme of EMF 2006 was "*L'enseignement des mathématiques face aux défis de l'école et des communautés*" and it gathered 258 participants from 17 different countries, including 8 African and 6 European countries. It was scheduled close to the annual meetings of two teachers' associations from the province of Québec, with one day common to the three conferences that brought together nearly 800 participants. A report on EMF 2006 appears in the *ICMI Bulletin 59* (December 2006).
- **AFRICME 2** (the *Second Africa Regional Congress of ICMI on Mathematical Education*) took place at the Catholic University of Eastern Africa, Nairobi, Kenya, on May 23-26, 2007. It is the second in this series that aims at offering a forum for mathematics educators throughout Africa. AFRICME 2 gathered 87 participants from 14 different countries, including the following African countries: Botswana, Burkina Faso, Kenya, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Uganda and Zimbabwe. A report on AFRICME 2 appears in the *ICMI Bulletin 60* (June 2007).
- **ICMI-EARCOME-4** (the *Fourth ICMI East Asia Regional Conference in Mathematics Education*) was held in Penang, Malaysia, on June 16-22, 2007. It was organised by the Universiti Sains Malaysia and attracted a total of 409 participants, including 156 foreign

participants from 22 countries, 169 local mathematics educators and teachers, and 25 foreign and 28 local postgraduate students. A report on EARCOME-4 appears in the *ICMI Bulletin* 61 (December 2007).

- **XII CIAEM** (the *Twelfth Inter-American Conference on Mathematical Education – Conferencia interamericana de educación matemática*) took place in Querétaro, México, on July 15-18, 2007. The congress, whose main theme was *Educación matemática: historia y prospectiva*, was attended by close to 800 participants from 24 countries. A report appears in the *ICMI Bulletin* 61 (December 2007).

There are presently two other **forthcoming Regional Conferences** approved by the ICMI Executive Committee:

- **EMF 2009** (*Espace mathématique francophone 2009*) will be hosted by the University Cheikh Anta Diop in Dakar, Senegal, on April 6-10, 2009. The theme of the conference is *Enseignement des mathématiques et développement : enjeux de société et de formation*. The ICMI EC is represented on the International Programme Committee of this conference by the President and the Secretary-General.
- **AFRICME 3** (the *Third Africa Regional Congress of ICMI on Mathematical Education*) will be hosted by the University of Botswana in Gaborone, Botswana, around May 2010. The ICMI EC is represented on the IPC by Vice-President Jill Adler.

6. Other Activities

Preparation for the celebration of the **centennial of ICMI**, in 2008, was pursued gradually during the period covered by the report. As the Commission was established in Italy, during the 1908 Congress of Mathematicians held in Rome, the Executive Committee was grateful that the Italian mathematicians and mathematics educators communities had accepted the task of hosting the symposium to be organised on this occasion. Ferdinando Arzarello, of the Università degli Studi di Torino, was appointed Chair of the International Programme Committee and the composition of the IPC was finalised early in 2005 and announced in the June 2005, No. 56, issue of the *ICMI Bulletin*. The IPC met early in 2006 to define the programme. The Local Organising Committee, chaired by Marta Menghini of the Università degli Studi di Roma La Sapienza, succeeded in arranging for the symposium to be celebrated at the Accademia dei Lincei in Rome, the very birthplace of ICMI. The symposium, held on March 5-8, 2008, aimed at reflecting on the evolution of mathematics education during the last 100 years and identifying emerging trends in the field. It was attended by more than 180 invited participants and the Proceedings, published by the Istituto della Enciclopedia Italiana, are expected to appear in 2008. A report on the symposium will be published in a later issue of the *ICMI Bulletin*. Updated information about the symposium can be obtained from the website www.unige.ch/math/EnsMath/Rome2008/.

Over the last years, ICMI has been sponsoring, jointly with UNESCO and other bodies, the development of a mathematical exhibition entitled “**Experiencing mathematics**”, whose aim is to improve the image of mathematics among the general public. The exhibition was officially launched in Copenhagen in July 2004 on the occasion of ICME-10, and was later shown in October 2004 in Orléans during a congress of a French association of mathematics teachers (APMEP). But its first appearance accessible to the public at large, and in particular to pupils and students, was in December 2004 in Paris. It was then on display at the Maison des Métallos,

in partnership with the Mairie of the Cité de Paris, from December 9 to 31 and was visited by more than 4000 people, mainly pupils. Three sets of the exhibit are now available and are being circulated internationally under UNESCO and ICMI auspices. The 2005 programme of travel included China (Beijing), Greece (Athens), Mozambique (Maputo) and South Africa (Johannesburg, Kimberley, Cape Town, Potchefstroom, Richards Bay). The African exhibition project was supported through a grant of 6 000 USD from IMU Developing Countries Strategy Group (DCSG) which covered the transportation to and from Africa. Additional funds needed to be raised for the circulation of the exhibit inside Africa. As the exhibition is devised so to evolve according to the local needs/culture/expertise, for instance by organising a regional and coherent pedagogical design around the exhibition, the Africa exhibits thus incorporated ingredients of ethnomathematics. The 2006 programme of travel included Namibia (15 towns, including Windhoek) — this marked the end of the one-year Austral Africa tour —, Thailand (Bangkok), Laos (Vientiane, Pakse et Luang Prabang), Viet Nam (Danang and Ho Chi Minh City), Spain (Madrid), where it was shown during and after the International Congress of Mathematicians in the Centro cultural Conde Duque (more than 30 000 visitors), and France (Lyon). The 2007 programme of travel included Cambodia (4 cities), Singapore (35 000 visitors), Viet Nam (two cities), Santiago de Chile, Lebanon (Beirut and Saida), India (Dehli, Kolkata, Bangalore, Mumbai), France, Portugal, Poland (Warsaw and Kraków) and Switzerland (Basel) in connection with the celebration of the 300th anniversary of Euler. The current plans for 2008 include Colombia (Bogotá), México (Monterrey, including the period of ICME-11), Paraguay (Asunción) and Argentina (Buenos Aires) in Latin America, India, Pakistan and the Philippines in Asia, and Portugal. The presentation of the exhibition in Latin America was supported by an IMU/DCSG grant of 3000 USD, and its travel to Cambodia, by a grant of 1500 USD. Initiated and supported by UNESCO, a **virtual exhibition** in four different languages has been developed, based on this interactive hands-on exhibition and aimed at secondary school mathematics teachers. The official opening of this additional component has taken place in March 2008 and it can be accessed at <http://www.experiencingmaths.org/>. It is estimated that from ICME-10 in Copenhagen to ICME-11 in Monterrey, more than 800 000 young people, their teachers and parents will have visited *Experiencing mathematics* in some 50 cities from 20 countries. More information is available on the website <http://www.mathex.org/>.

Following a recommendation of the Ad Hoc Sub-Committee on “Supporting Mathematics in Developing Countries” appointed in 2003 (see the Report on ICMI Activities in 2000-2004, *ICMI Bulletin* No. 54, December 2004, pp. 32-48), the IMU Executive Committee established in early 2004 the **Developing Countries Strategy Group (DCSG)** with the charge of increasing, guiding and coordinating IMU’s activities in support of mathematics and mathematics education in the developing world. ICMI has been at the outset represented in the DCSG by Michèle Artigue. The first meeting of the DCSG was held at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, on 16-17 October 2004. Among the actions considered by the DCSG was the creation of a web-based Clearinghouse for African Mathematics, which housed at ICTP. ICMI offered to contribute to this project by collecting information about activities linked to mathematics education in Africa, in particular as regards existing associations, projects, master and doctorate programmes in education, and mathematics competitions. The DCSG also then approved a grant to support the circulation in Africa of the international mathematics exhibition “Experiencing Mathematics” (see above). During 2006, the DCSG provided a grant of 5 000 USD for the teachers’ workshop organised in Hanoi on the occasion of ICMI Study 17.

With the help of the *Centre international de mathématiques pures et appliquées* (CIMPA), suitable candidates from neighbouring countries have been identified for this workshop. This contributed to initiate some of the networking needed in preparation for the “PCMI-like” seminar (see below) planned for Cambodia in 2010 and jointly supported by PCMI, CIMPA and ICMI. At its June 2007 meeting, the new ICMI EC decided that Vice-President Jill Adler would replace Michèle Artigue as the ICMI representative on the IMU Developing Countries Strategy Group (DCSG) and later, once created, on the new IMU structure, namely the Committee for Developing Countries (CDC), proposed by the IMU General Assembly held in August 2006. The CDC brings together the work of the DCSG and the Commission for Development of Exchange (CDE), and will act as an interim committee until 2010 when it will be formally approved by the IMU General Assembly as an IMU Commission merging the work of the DCSG and CDE. Activities related to ICMI action have received financial support from IMU, through the CDE, in 2007. The ICMI Regional Conference AFRICME 2, held in Nairobi, Kenya, was given 4000 USD. As mentioned above, the presentation of the mathematical exhibition “Experiencing Mathematics” in Latin America was supported by a grant of 3000 USD, and its travel to Cambodia, by a grant of 1500 USD (this support was for the organization of a one-day workshop on the theme “The Usefulness of Mathematics”, to take place in Battambang, on 9 March 2007; the request for such support was directly sent to IMU by Chan Roath, who organized the travel of the exhibition in Cambodia, and not by ICMI). Two Vietnamese teachers who had taken part in the ICMI Study 17 Conference in Hanoi, in December 2006, were invited to the 2007 International Seminar of the Park City Mathematics Institute hosted by the Institute for Advanced Study (Princeton USA). The theme of the 2007 PCMI International Seminar on Mathematics Education was “Bridging Policy and Practice: Mathematics Education Around the World”.

ICMI has been co-sponsoring since 2001 international workshops organised in Utah, USA, in the context of the annual **Park City Mathematics Institute** (PCMI) hosted by the Institute for Advanced Study, Princeton, USA. The International Seminar on Mathematics Education has engaged each year mathematics educators from a diverse set of countries in a stimulating five-day discussion about common issues and concerns in the teaching and learning of mathematics, with a particular focus on teacher preparation and development. The 2004 session took place during ICME-10, where many participants from the first three years shared with the larger mathematics education community the outcome of the first seminars and considered with this larger group how to continue the dialogue at future Institutes. In 2005 PCMI has supported the participation to the ICMI Study 15 conference on teacher education of two persons involved in the PCMI International Seminar (from Cameroon and Iran). As in 2004, former participants at the PCMI International Seminars will gather at ICME-11 and a presentation will be made in the context of Discussion Group 6 on “The nature and roles of international cooperation in mathematics education”.

ICMI was invited in 2004 to join with organisers of the PCMI International Seminar (Gail Burrill, Herb Clemens, Joan Ferrini-Mundy and Johnny Lott) for a meeting with **World Bank** officials. This meeting took place in Washington in September 2004 and ICMI was represented by the Secretary-General. The purpose of this meeting was to examine how the PCMI International Seminar model could be used in approaching issues of mathematics education in developing countries. Interest was expressed by the World Bank about the preparation of a

“policy brief” on the education of teachers which could be based on research done for instance in the countries having taken part in the PCMI International Seminar and could also encourage other countries to be involved in research of their own. The World Bank also expressed interest for the ICMI networking capacity with the leadership in mathematics education around the world, as it is connected to scientific societies and individuals in academic institutions, and is thus complementary to the links that the Bank has with governments and ministries of education. Discussions have centred on two projects of joint workshops for training mathematicians and mathematics teachers. One, mentioned above, concerns Cambodia and neighbouring countries, in partnership with CIMPA (*Centre International de Mathématiques Pures et Appliquées*), and the other Africa, in partnership with AMMSI (African Mathematics Millennium Science Initiative). In each case, ICMI is involved in the mathematics teacher education component. None of these projects have yet come to implementation.

In a similar vein, ICMI has been invited by the Director of Education at **OECD (Organisation for Economic Co-operation and Development)** to participate in a Forum on education and social cohesion organised by OECD on the occasion of a meeting of Education Ministers held in Dublin on March 18-19, 2004. This meeting, where ICMI was represented by the Secretary-General, was a first opportunity for a direct link of ICMI with the OECD Directorate for Education. These contacts were pursued later in the year when the Secretary-General and Vice-President Michèle Artigue met at OECD headquarters in Paris with more people of the OECD Directorate for Education. Interest was then expressed by OECD for the “Pipeline” project (see item 7 below), as well as for the themes of teacher education and development (the topic of ICMI Study 15) and mathematics for the workplace (which was then presented as a possible topic for a future ICMI Study).

In 2006, the ICMI EC was contacted by the chief editor of *Educational Studies in Mathematics* (ESM, the leading journal in the field of mathematics education, founded in 1976 by Hans Freudenthal and now published by Springer) about the problems raised by the fact that only one journal in the field, namely the *Journal for Research in Mathematics Education*, is considered in the ISI Social Sciences Citation Index (SSCI). This raised the global issue of the assessment of the quality of research in mathematics education as reflected in the inclusion (or non-inclusion) of mathematics education research journals in **scientific indexes** such as the SSCI of ISI Thompson, the index most widely in use. After discussion within the EC, and after considering the journal citations in the proceedings of the recent conferences of PME, an Affiliated Study Group of ICMI, — which clearly confirmed the leading role played by ESM —, it was decided at the final meeting of the 2003-2006 EC, held in November 2006, that both the outgoing and incoming Presidents of ICMI would send a joint letter to ISI pointing out the negative consequences of such a situation and asking for the insertion of at least ESM in the SSCI. The letter was sent in December 2006. It did not have immediate positive result, but ISI recognized ICMI arguments as consistent and also agreed on the necessity of pursuing the discussion on the representation of the field of mathematics education. The 2007-2009 ICMI EC has pursued the reflection started by the previous Executive. As regards the specific case of the position of the journal *Educational Studies in Mathematics* (ESM) in the SSCI, the current ICMI EC is fully supportive of the position taken on that account by the previous EC. The Committee feels that it is obliged to draw to the attention of those in charge of the evaluation of research in mathematics education, the scientific bias in the current situation. Moreover the EC is much sensitive to the

potential risks for the field of an abusive use of such citation indexes in the assessing the quality of scientific research. The EC of ICMI is in no doubt that the SSCI of ISI Thompson cannot be considered as an appropriate means for appreciating and assessing the quality of research in mathematics education. Because of the potentially harmful effects on our field of the use of this metric, the ICMI EC expressed its willingness to collaborate with ISI or other agencies in their efforts to achieve an improved representation and evaluation of research in mathematics education. At the ICMI EC meeting in June 2007, it was decided to set up a subcommittee specifically for this purpose, to include as members, the past ICMI President, Hyman Bass, the current President Michèle Artigue, the vice-President Jill Adler and Celia Hoyles. A position statement of the ICMI EC on this issue was posted on the ICMI website in October 2007.

The President and Secretary-General of ICMI were pleased to receive in 2004 an invitation from the Editor of the *Notices of the American Mathematical Society* to contribute, on the occasion of ICME-10, a paper providing basic information about the Commission — its aims, history, activities, etc. —, keeping in mind the usual readership of the *Notices*. The resulting article, “The International Commission on Mathematical Instruction — What? Why? For Whom?” appeared in the *Notices of the AMS* vol. 51 (6) (June/July 2004) pp. 639-644, and was reproduced with permission in the *ICMI Bulletin* No. 55 (December 2004), pp. 23-31.

7. IMU Concerns about Mathematics Students

Declining numbers of students are choosing to pursue mathematics study at the university level, and many of those who do, even with some initial enthusiasm for mathematics, are discouraged by their early university mathematics instruction and so turn away from it. The resulting decline in the numbers and quality of students pursuing university mathematics studies is a worldwide trend, now for more than a decade, and it threatens the vigour and growth of the mathematical sciences, on which contemporary societies and economies fundamentally depend. The professional mathematics community is not alone in being seriously concerned about this, and this has led the IMU EC to call for a gathering of data to document this trend internationally, and analyze its causes. The IMU has enlisted ICMI to partner in this undertaking, and take responsibility for its design.

This trend draws attention to another, distinct but importantly related, problem, which is the inadequate supply of mathematically qualified students choosing to become mathematics teachers in the schools. Thus, gathering data to understand these two parallel phenomena has become the agenda of a joint project of the IMU and ICMI, called the “**Pipeline Project**”, which will lead to a report that should be of wide interest, in a number of countries, to mathematics departments, schools of education, government policy and funding agencies, and others. This project was initiated at the July 2004 ICMI EC to which IMU President John Ball participated. A task group, chaired by ICMI EC member Frederick Leung, has been appointed with the mandate to define a detailed work plan for the project and frame it as a proposal for funding to relevant funding agencies. Comments were later received that the initial plans about the Pipeline Project were too ambitious as regards the scope of the project and the number of countries first identified as being potentially involved. Suggestions were made about the need to work with a small group of countries, and to clearly identify what kind of data is to be collected and analyzed. The task force already appointed to run this project had a meeting in April 2007 at the Headquarters of the

American Mathematics Society (AMS) in Providence, US, so to formulate more exactly the questions to be answered, to develop a finer design of the data that needs to be gathered to answer these questions — to the extent possible from existing sources —, and finally to consider how it can be synthesized meaningfully across different cultural settings. There were also reflections on identifying some major professional organisations that would collaborate to this project. The work on the Pipeline project has also been connected to that of the Survey Team for ICME-11, chaired by Derek Holton (New Zealand), on the topic of “Recruitment, entrance and retention of students to university mathematical studies in different countries”. The Pipeline project was one item on the agenda of the June 2007 meeting of the ICMI EC. A letter was later sent to a set of countries (Australia, Finland, France, New Zealand, Portugal, Singapore, and USA) inviting them to participate in the project and asking them to indicate whether some specific relevant statistical data were readily available, and if not, whether they were easy to gather. Countries were also asked to provide information about their education system. The project receives a strong support from the mathematical societies in the participating countries and is run in close collaboration with them. The current timeline indicates that the year 2008 will be devoted to further data collection and analysis and that a preliminary report will be written by March 2009. The final report of the Pipeline project is expected by September 2009.

8. ICMI Affiliated Study Groups

ICMI continues to have five Affiliated Study Groups, namely (in the chronological order of their affiliation to ICMI) **HPM** (The International Study Group on the Relations Between the History and Pedagogy of Mathematics) and **PME** (The International Group for the Psychology of Mathematics Education) — 1976, **IOWME** (The International Organization of Women and Mathematics Education) — 1987, **WFNMC** (The World Federation of National Mathematics Competitions) — 1994 and **ICTMA** (The International Study Group for Mathematical Modelling and Applications) — 2003. As was the case at ICME-10, all the ICMI ASGs will appear on the programme of ICME-11 in the Affiliated Study Groups slots. Moreover, two of them will hold conferences as satellite meetings of ICME-11. HPM 2008 will take place in the Centro Cultural del México Contemporáneo, Mexico City, México, on July 14-18, while PME 32 will be held jointly with PME-NA XXX in Morelia, México, on July 17-21.

On the occasion of ICME-10, the President and Secretary-General of ICMI were invited to participate in the ceremony of the **Paul Erdős Awards**. These awards were established by the WFNMC to recognise contributions of mathematicians which have played a significant role in the development of mathematical challenges and which have been a stimulus for the enrichment of mathematics learning. In 2004, the recipients were Warren Atkins (Australia), André Deledicq (France) and Patricia Fauring (Argentina), and the awards were presented by ICMI President Hyman Bass.

9. The ICMI Solidarity Program in Mathematics Education

A new **Ad Hoc Committee** has been appointed in 2003 to review the functioning of the Solidarity Programme and make recommendations to the Executive Committee concerning its orientation and development. The Chair of this Committee, Alan Bishop (Monash University, Australia), played in this connection the role of an ICMI Commissioner with a responsibility for

solidarity and equity. A preliminary report of the Ad Hoc Committee proposing a series of possible directions was received by the EC in June 2004 and presented by the Chair of the Committee at the General Assembly of ICMI held during ICME-10. Peter Galbraith, member of the EC, was responsible for the follow up on this dossier. At its final meeting in November 2006, the 2003-2006 ICMI EC has concluded that the practical implementation of some of the recommendations needs to be further explored. Consequently the setting up of a Solidarity Steering Sub-Committee, as recommended in the report, is the next step in leading to further discussions and actions.

A grant of 2 000 USD from the ICMI **Solidarity Program** was given to the organisers of ICMI Study 17 in order to partially support the participation of 11 Vietnamese teachers to the workshop organised on the occasion of the Study conference held in Hanoi in December 2006.

10. The ICMI Awards

A call for suggestions for the 2005 **ICMI Awards** has been launched by the Award Committee, chaired by Vice-President Michèle Artigue, and disseminated among the mathematics education community through various channels (ICMI Representatives, Affiliated Study Groups, national and international journals and associations). The two recipients of the ICMI Awards in mathematics education research for the year 2005 were announced in a press release issued on April 3, 2006 (see *ICMI Bulletin* No. 58, June 2006, pp. 6-10). The awardees are Ubiratan D'Ambrosio for the 2005 Felix Klein Medal, and Paul Cobb for the 2005 Hans Freudenthal Medal.

At the end of 2006, ICMI Vice-President Michèle Artigue ended her term as the first chair the **ICMI Award Committee**, responsible for selecting the recipients of the Awards, and was succeeded by Mogens Niss. In addition, Richard Noss and Anna Sfard also then completed their term on the Committee and new members were added to bring its membership to six (three members completing the second half of their eight-year term and three beginning a new term, for eight years as well). A report from the Award Committee has been submitted to the ICMI Executive Committee early in 2007 about the functioning of the selection process for the first two sets of awards. It should be noted that the Award Committee agreed on the following ethical rule: once the Committee decides to include in its lists of nominees an individual close to one of its members, that member is then excluded from all exchanges and discussions regarding the corresponding award. This was the case for Richard Noss with respect the 2003 Freudenthal award, finally given to Celia Hoyles. A report on the work of the ICMI Award Committee by its outgoing Chair appears in the June 2007 (No. 60) issue of the *ICMI Bulletin*.

A call for suggestions for the 2007 **ICMI Awards** has been launched in June 2007 by the new Award Committee, chaired by Mogens Niss, and disseminated among the mathematics education community through the usual channels. The two recipients of the ICMI Awards in mathematics education research for the year 2007 were announced in a press release issued on April 1, 2008 (see elsewhere in this issue of the *ICMI Bulletin*). The awardees are Jeremy Kilpatrick for the 2007 Felix Klein Medal, and Anna Sfard for the 2007 Hans Freudenthal Medal.

The medals and certificates for the 2005 and 2007 ICMI Awards will be presented at the opening ceremony of ICME-11 and lectures by each of the awardees are on the programme of the congress.

11. IMU/ICMI Digitisation Programme

In the context of IMU programme of open access to IMU publications, ICMI was offered in 2007 by the IMU EC to receive support from the IMU Committee on Electronic Information and Communication (CEIC) for a similar project as regards ICMI publications. As ICMI had been contemplating for a long time making widely available on its website the various documents connected to and resulting from its activities, this offer was most timely. The aim is that the **ICMI Digital Library** would eventually make available freely online all the ICMI material. In a first step, besides the various issues of the *ICMI Bulletin* from its very beginning, the priority in digitising material is given to past Proceedings of all the ICME congresses and to the ICMI Study volumes. The ICMI EC is grateful to IMU for its exceptional support in this endeavour.

12. Information and Communication

At its June 2007 meeting, the ICMI EC finalised the decision to launch an electronic newsletter. This project of establishing a means of prompt, efficient and brief communication had been under discussion for a certain time by the previous EC and the first issue of ICMI News has finally appeared in December 2007. The aim of this newsletter is to improve communication between ICMI and the worldwide community interested in mathematics education by regularly providing information about actions and recommendations of ICMI, highlighting issues that are under discussion and reporting about ongoing activities. In addition, *ICMI News* reports on major activities by the ICMI Affiliated Study Groups (HPM, PME, IOWME, WFNMC and ICTMA), on major international events related to mathematics education, and on other topics of interest to the international mathematics education community. The Editor of *ICMI News* is Jaime Carvalho e Silva, member of the ICMI Executive Committee. The ICMI EC is grateful to the IMU EC for the logistic support provided to the publication and dissemination of the ICMI e-newsletter, in particular as regards online subscription. *ICMI News* will appear every two months, alternating with IMU own electronic newsletter, *IMU-Net* (www.mathunion.org/Publications/Newsletter/).

The project of redesigning and updating the **ICMI website** has progressed more slowly than expected. The new website, which will still be hosted on the IMU server, is planned to be launched by the time of ICME-11. ICMI has adopted the recent policy of IMU to use a Content Management System (CMS) as the environment for the website, which will allow for easier maintenance and updating of the content of the website, as several persons (with a proper access authorisation) will be entitled to edit the contents of the site separately and independently from the webmaster. The CMS used by IMU is the open source system TYPO3.

For the years covered in this report, the appearance of the *ICMI Bulletin* has been slightly erratic, as some of the planned issues have undergone delays in publication and are still outstanding at the time of this report.

Since the inception of the Commission in 1908, the official organ of ICMI has been the journal *L'Enseignement Mathématique*, established in 1899. ICMI has reinvigorated in recent years its contact with the journal, especially on the occasion of the celebration in 2000, organised jointly with the University of Geneva, of the centennial of *L'Enseignement Mathématique*, as well as the recent celebration of the ICMI centennial in Rome in March 2008. During the years covered in this report, the following ICMI-related information has appeared in *L'Enseignement Mathématique*:

- Announcement of 2003 ICMI Awards, vol. 50 (2004), pp. 183-186.
- Report on 2002 ICMI EC elections and adoption of new Terms of reference, vol. 50 (2004), pp. 187-190.
- Discussion Document for ICMI Study 15, vol. 50 (2004), pp. 191-200.
- Discussion Document for ICMI Study 16, vol. 51 (2005), pp. 165-176.
- Discussion Document for ICMI Study 17, vol. 51 (2005), pp. 351-363.
- Report on ICMI Study 10, vol. 51 (2005), pp. 365-372.
- Announcement of 2005 ICMI Awards, vol. 52 (2006), pp. 187-190.
- Discussion Document for ICMI Study 18, vol. 53 (2007), pp. 179-191.
- Report on ICMI Study 11, vol. 53 (2007), pp. 429-436.

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