

ICMI

ICMI Newsletter 27

*A Newsletter from the ICMI-International Commission on
Mathematical Instruction*

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Contents

1. Editorial – From the desk of Catherine Vistro-Yu, Member-at-Large, ICMI Executive Committee.
2. Emma Castelnuovo, In Memoriam
3. ICMI Study 23
4. CANP, Tanzania.
5. Meeting of the ICMI EC
6. A request for the archives
7. Pipeline Project: Current Status 2014
8. Unpublished issues of the ICMI Bulletin
9. Have you read?

1. Editorial – From the desk of Catherine Vistro-Yu, Member-at-Large, ICMI Executive Committee

One of my favorite activities in my undergraduate classes is engaging my students in some “question and answer” conversation about the lesson of the day, almost like a mathematical discourse but not quite. With my students in calculus for instance, discussions of the concepts of limits and derivatives can be amusing, exciting and instructive. They are amusing because students at first try to convey their ideas using their own words but in the end repeat what is in the book or what I say in class. They are exciting because when pushed harder, students get more involved and later discover that they know more than they think

they do. They just do not know how to “say” it. More importantly, these discussions are instructive to me as the teacher because often students reveal erroneous or limited thinking that needs to be corrected right on the spot or explained further.

It is not easy to begin and sustain a mathematical discourse and like most teachers, I wish I could do it more often and with more success. Discourses can fall flat and end up merely being shallow discussions, clarifications, or at worst a brief exchange of questions and one-line answers. My curiosity lies in what my students truly think and understand, on the other hand my students are

merely interested in knowing the right answers to my questions. This limited view of the purpose of mathematical conversations hinders the students' genuine engagement in the discussion.

Another difficulty I have in sustaining a mathematical discourse relates to culture. Although my students mostly come from high performing secondary schools, they find mathematical conversations uncomfortable. They are afraid to share their thoughts in class for fear of being ridiculed by classmates or the teacher. I also find that many of my students are simply not used to genuine exchanges of ideas. They end up wanting to argue, debate and eventually "win" (have the last say) or they simply clam up and submit to my thoughts.

It is largely for this last reason that a Topic Study Group on Quality Use of Language and Discourse in Mathematics is included in the 7th ICMI-East

Asian Conference on Mathematical Education (EARCOME 7). The topic is novel and it is a unique challenge for East Asian mathematics classrooms.

I invite all of you to come join us in Cebu, Philippines on May 11-15, 2015 for this exciting conference. With the theme, "Quality Mathematics Education for All" the scientific program is full with plenary lectures, parallel sessions and a poster session. Do check out our website <http://www.earcome7.weebly.com> for more information and conference updates. I hope to see many of you there next year.

Meanwhile, please enjoy this edition of the ICMI Newsletter.

2. Emma Castelnuovo, In Memoriam

Shortly after ICMI announced the launching of the award in her name (see the March issue of the ICMI News), Emma Castelnuovo passed away on April 13th, 2014 at the age of 100 years and four months. She was born in Rome in December 1913 to the mathematician Guido Castelnuovo (1865-1952) and to Elbina Enriques, sister of the mathematician Federigo Enriques. After graduating in mathematics in 1936, she worked as librarian in the Institute of Mathematics at the University of Rome. Between 1939 and 1943 and due to the Italian racial laws (*leggi razziali*) she could only find work as a teacher in a Jewish school. In 1943, the family fled the Nazi roundups taking refuge with friends, in hospitals, and in religious institutions. After the war she taught mathematics in the Torquato Tasso secondary school in Rome and worked intensively with fellow teachers to rethink and renovate teaching methods. She published several books among them "Geometria Intuitiva" (which was very popular also in Spain in its Spanish version), "Didattica della matematica" and "La matematica nella realtà" (Mathematics in the real world).

In her books, Emma Castelnuovo wrote that a main objective is to awaken the intuition, the interest of the students in the subject and their taste for research through the observation of facts, techniques and fundamental properties of geometric figures. She believed that intuition, interest and taste are not innate, but rather they develop when students participate in creative work. Teachers need to stimulate the natural and instinctive curiosity of students, to lead them through the discovery of mathematical truths, to convey the idea of doing mathematics by themselves and to instill the feel for the need for a progressive logical reasoning.

Her work on didactics of mathematics was very influential in several countries.

The announcement and the call for nominations for the Emma Castelnuovo award can be found at

<http://www.mathunion.org/icmi/activities/awards/emma-castelnuovo-award/>

3. ICMI STUDY 23

The Discussion Document for the ICMI Study 23 on Primary Mathematics Study on Whole Numbers is now published and it includes a call for papers for the Study Conference to be

held in Macau, June 3-7, 2015. The Discussion Document can be found at http://www.mathunion.org/fileadmin/ICMI/docs/ICMIStudy23_DD.pdf

4. CANP TANZANIA

CANP (Capacity and Networking Project) was launched some four years ago by the international bodies of mathematicians and mathematics educators (International Mathematical Union, IMU & International Commission on Mathematical Instruction, ICMI) in conjunction with UNESCO and International Congress of Industrial and Applied Mathematics, ICIAM. The project is a response to Current Challenges in Basic Mathematics Education (UNESCO, 2011).

CANP aims to enhance mathematics education at all levels in developing countries so that their people are capable of meeting the challenges these countries face. It seeks to enhance the educational capacity of those responsible for the preparation

and development of mathematics teachers, and to create sustained and effective regional networks of teachers, mathematics educators and mathematicians, with strong links to the international community. Three CANP conferences were already held in different parts of the world and their success is shown by their satisfaction of the participants and by the establishment of many follow-up activities. The upcoming CANP meeting will take place in Dar-es-Salam, Tanzania, in September 1-12, 2014 and will gather about 45 participants from East African countries. For more details, see <http://www.mathunion.org/icmi/activities/outline-to-developing-countries/canp-project-2014-east-africa/>

5. Meeting of the ICMI EC

The Executive Committee (EC) of ICMI held its second annual meeting in Rio de Janeiro, Brazil, on April 22-24, 2014. The topics discussed included the launching of future ICMI studies, future CANP conferences, future ICME conferences and

fundraising. The EC is open to suggestions and comments from all country representatives and from any member of the community. These may be submitted to any member of the EC.



6. A Request for the Archives

The first International Congress on Mathematical Education was held in Lyon, France on August 24-30, 1969. The Proceedings (286 pages) were published by Reidel Publishing Company. ICMI

will be grateful to receive as a donation a copy of the Proceedings for its Archive. For that purpose, please contact Bernard Hodgson, at Bernard.Hodgson@mat.ulaval.ca

7. Pipeline Project: Current Status 2014

The "Pipeline" Project is a study about the supply and demand for mathematics students and personnel in educational institutions and the workplace. In 2010, at ICM in Hyderabad, India, the Pipeline Project presented its final report. In the following year, all the data was archived on the ICMI website under "Activities". At that time, a notice appeared in the ICMI Newsletter advertising the availability of the data, and inviting researchers to use it, and also inviting anyone interested to take responsibility for developing the data for other countries and/or keeping existing data up to date.

We reiterate our call for researchers to add to, and use, the data from the project.

It is possible to restate the main outcomes of the Pipeline Project, noting again that the data gathered was restricted to a small number of countries.

- Process: The collection of time-series data on the numbers of students studying mathematical sciences at different levels, or the number of teachers with different mathematical qualifications, is much more difficult than anticipated. There are many reasons: the data is collected by many different organisations, even within one country; the data categories do not stay

stable categories do not stay stable over time as educational organisational structures and assessment systems change regularly; data categories are not well-defined; and the data categories are not equivalent across different nations.

- Conclusion: While there is cause for concern within particular countries about a decline or lack of growth in the numbers of mathematical science students and/or mathematics teachers at different levels, globally the numbers in both categories are probably climbing.
- Conclusion: In some countries, if not all, the demand for mathematically educated people in the workforce is growing faster than any growth in numbers coming through the Pipeline. (It is possible that this divergence is the cause of the concern about an apparently declining Pipeline). The cause of the fast growth in demand is the particular demands of both IT and Financial sectors of the workplace market.

For more information and for access to the data from different countries, see <http://www.mathunion.org/icmi/activities/pipeline-project/>

8. Unpublished Issues of the ICMI Bulletin

As previously announced, the publication of the ICMI Bulletin was discontinued. Its functions will be covered by the ICMI News, the ICMI website, and ICMI Facebook. A section was especially created within the website to collect the papers from previous unpublished issues, which are

gradually beginning to appear thanks to the efforts of Bernard Hodgson, former editor of the Bulletin, with the help of Lena Koch, ICMI administrator. For the papers which were already uploaded, please see the section "Have you read?" below.

9. Have you read?

- “A Practical and Theoretical Agenda for Progress in Mathematics Education” – Alan Schoenfeld. This paper describes an agenda for action and its challenges aimed at supporting children’s development of the ability to engage in sense-making in and with mathematics, a deeper understanding of mathematical ideas, the ability to use mathematical ideas productively in solving problems, and a more positive view both of mathematics and of themselves as sense-makers in mathematics. The paper can be found at:
http://www.mathunion.org/fileadmin/ICMI/docs/Schoenfeld_Math_R_D_Agenda.pdf

- “The role of professional associations in mathematics education” - Corinne Hahn, Will Morony and Tomas Recio. This paper deals with the following questions: How do the different groups see their roles? How do they undertake their work? What, in particular, is their role in relation to educational reform? To what extent do the different groups (mathematicians, mathematics teachers and mathematics education researchers) collaborate? Should the relations between associations be strengthened? Is there a new role for associations in the context of the current global trend for evaluation of performance through PISA, TIMSS, etc.? Would it be desirable to establish a world federation of mathematics teacher associations to help respond to this and other global trends and issues? The paper can be found at
http://www.mathunion.org/fileadmin/ICMI/docs/The_role_of_professional_associations_in_mathematics_education.pdf

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