November / December 2015

PME Newsletter

International Group for the Psychology of Mathematics Education

Message from PME President Barbara Jaworski

PME 40 is on the way!

Dear Colleagues in PME,

I feel very privileged to be President of PME in its 40th year – an auspicious time! My first PME was PME 10 in 1986, and I am amazed to find that I have been attending PME for 30 years. PME 40 will be my final year as President.

In 2016, PME 40 will be held in Szeged, Hungary (Aug 3-7), and Chaired by Professor Csaba Csikos at the University of Szeged (https://www.u-szeged.hu/english). You can find the web site for PME 40 at http://pme40.hu. The title of the conference is *Mathematics Education: How to Solve It*? In the first announcement, …[*continued overleaf*]

Inside this issue

Message from the Editors

Welcome to our November / December 2015 Newsletter. In this issue there is a first enticing glimpse of PME 40 in Szeged, Hungary — our 40th anniversary! In this context, we would like to encourage you to consider submitting a research colloquium (see later in the Newsletter). Further, our newsletter contains updates from the PME International Committee as well as detailed reports on WG and DG sessions at PME 39. As previously, we like to point to the possibility to using the Announcements Forum on the PME website when you have items to announce. Enjoy reading the Newsletter!

Take care and seasons greetings.

Keith Jones (d.k.jones@soton.ac.uk) and Maike Vollstedt (vollstedt@math.uni-bremen.de)

Message from PME President Barbara

..the organisers write:

> *This title reminds all participants that 70 years ago the Hungarian Pólya György (George Pólya) published his seminal book entitled "How to solve it?". This book was used by generations of mathematics teachers as their inspiring source of teaching ideas. Besides commemorating Pólya's oeuvre, the title evokes the everlasting debate on the role of mathematical problem solving in fostering children's thinking.*

The conference will include the familiar types of sessions, details of which can be found in the first announcement on the PME 40 website.

In 2006, for PME 30, a special volume was published (1976-2006), Handbook of Research on the Psychology of Mathematics Education, celebrating 30 years of research in PME. For 2016, we expect to have another special volume celebrating another decade of PME research. The editors are Angel Gutierrez (Spain), Paolo Boero (Italy) and Gila Leder (Australia) and it will be published again by Sense Publishers.

PME 40 will take place in the same year as ICME 13 which is held in Hamburg, Germany (July 24-31). As a group affiliated to ICME, PME will have a 90 minute session at the ICME conference to present the work of PME to an ICME audience. At PME 40, this session will be chaired by PME Secretary, Michal Tabach and will include presentations by the Chairs of PME panels for the last four years. Thus, we will bring to ICME a flavour of the topics we have debated over these years. In 2016, in addition to this usual presentation of PME's research, we have been granted a special lecture to recognize PME's 40th year. The lecture will be given by Former President, Rina Hershkowitz (Israel) and Former Vice President, Stefan Ufer (Germany).

An innovation in PME in the last two years is the inclusion of a special day for early career researchers directly before the PME conference. These days have been led jointly by a member of PME and a member of the Local Organising Committee, and have attracted many participants. We shall have another such day at PME 40, to which we warmly welcome those who are (relatively) new to research in Mathematics Education. At the AGM in PME 40 we hope to institute the Early Careers Day (ERD) as an established part of the annual PME meeting.

At a PME conference, we elect members to our International Committee which ensures the effective and efficient continuation of PME into the future. Each year, 4 members retire and 4 new members are elected. PME relies on the energy and enthusiasm of its IC members for its continued success; you might like to consider standing for election. This coming year we shall also be electing a new President, so please think about who you might like to take on this role.

Over the coming months, we shall be telling you more about the conference in 2016 and hope you will join us on this very special occasion.

Barbara Jaworski
President of PME

PME International Committee Report

The Vice-President's Portfolio Group (VPPG)

Submitted by Wim Van Dooren (Belgium, Vice-President), Csaba Csíkos (Hungary), Cris Edmonds-Wathen (Sweden), Mellony Graven (South Africa) Masakazu Okazaki (Japan)

The focus of the Vice-President's Portfolio subgroup (VPPG) of the IC is the scientific activity of PME. Since August 2015, the VPPG has been working on several topics that were carried over from previous years, and some new ones. Rather than listing all aspects that the VPPG continues to work on, we are elaborating a few issues that may be of direct interest to the PME members.

Early Researchers' Day

The past two PME conferences have been preceded by an Early Researchers' Day, an event which aims at researchers at the end of their doctoral phase or the beginning of their post-doctoral career, in order to develop research skills, establish new contacts and build up scientific networks, and carry this network already into the forthcoming PME conference. The Early Researchers' Day precedes the annual conference, and has approximately 40 participants.

Based on the feedback of the past two events, Stefan Ufer as a past vice-president and as invited PME representative, along with the VPPG took over the responsibility to assist the local organizers in Szeged in the organization of the event. More information will be available through the PME 40 website. The International Committee is currently also working towards a proposal to make the organization of an Early Researchers' Day part of the policy for future PME conferences.

Presentation formats

In past years, we have worked on improving the descriptions of the various presentation formats (Research Reports, Oral Communications, Discussion Groups, etc.), including the main guidelines and processes for submission of a proposal for each presentation format. This was done to remedy some frequent problems with several submissions. The rewritten and restructured descriptions of several presentation formats are available on the PME website.

In the coming year, we aim to work further on the description of some of the presentation formats. For instance, based on a survey amongst organizers of group activities (Research Forum, Discussion Group, Working Session) at the past PME conferences, we will attempt to come up with more precise descriptions that delineate the differences between them. We will also consider the organization of the poster sessions, and the way presentation time can be explicitly assigned to posters. A format that is also under further consideration is the Plenary Panel. At the PME 39 conference in Hobart, this panel was run in a different manner, namely as an Oxford style de-

The Vice-President's Portfolio Group (VPPG) (continued)

bate, in which two groups of opponents - under the strict supervision and moderation of a chairperson - debated a controversial statement. We heard many positive reactions from the audience about the debate. Therefore, the International Committee has decided to try out this new format again at the PME 40 conference. If this experience is also successful, we may consider changing the Plenary Panel format for future conferences.

Regional conferences

The VPPG has raised the idea of starting a new initiative on behalf of PME, with the aim to provide support to researchers from regions which are currently underrepresented within PME in order to organize a conference in their region with the aim to support the development of a regional research community that pursues the goals of PME (network building), to attract researchers from the region to future PME conferences (international networking) and support them in preparing high quality PME contributions. Based on the valuable feedback that we received during the Annual General Meeting at the PME 39 conference, we are currently developing these ideas further, in order to make a more concrete proposal to the PME membership.

Policy Portfolio Group (PPG) Report

Submitted by Anke Lindmeier (Germany)

The Policy Portfolio Group (formerly known as President's Portfolio Group) is working on issues of internal and external issues, such as policy and membership. For the year 2015-16, the members are Kim Beswick (Australia), Marta Civil (USA), David M. Gomez (Chile), Anke Lindmeier (Germany, leader of the PPG). Since July 2015, the PPG has been working on several topics. In this report we will present some of them. In some cases, these carry forward the work of the PPG from the previous year. Besides the ongoing tasks, we especially worked on certain policies for different topics.

Ongoing Tasks

The PPG is responsible for collecting and keeping track of the official IG PME policies. Moreover, we maintain documents that are important for the work of the IC, e.g., an overview of decisions and discussions made by the different governing organisations.

Sponsorship policy

In former years, conference organizers expressed a lack of clear guidelines on sponsorship practices. Of course, a PME conference might be supported (with money or other resources) by sponsors, but it is necessary to ensure that sponsorship practices are in line with the aims and scope of IG PME and its annual conferences. Therefore, a policy on sponsorship was developed that (1) clarifies types of sponsoring, (2) gives

Policy Portfolio Group (PPG) Report (continued)

guidelines on matters of visibility of sponsoring, and (3) clarifies the need of contracts with sponsors. With this sponsoring policy, we support our conference organizers in providing a clear framework, but I want to stress that there were no issues arising at previous conferences in respect to sponsoring. At the end of 2015, the sponsorship policy will be ready for being voted on by the IC and we will present it at the next AGM in 2016.

Surplus policy

PME acts very thoughtfully on financial issues, fully aware that PME money belongs to PME members and is only managed by the organization. Despite this, due to good conference planning, a high number of participants and a strategy to avoid any financial shortfall to the disadvantage of our conference organizers, PME is in a healthy situation and holds a certain surplus. The term surplus refers to funds in addition to a reserve fund sufficient to cover the annual conference and operations for the year. As discussed at recent AGMs and policy meetings, the surplus should be expended so as to further the aims of IGPME. In addition, PME strongly values inclusion and so activities that foster inclusion at all levels of operation should be considered favourably for funding from the surplus. At the moment, we work on the development of a policy that will enable a reasonably quick, yet just and maximally effective, use of the surplus for the given aims. We are confident that a first framing policy on that issue can be presented for voting at the next AGM in 2016, so that hopefully concrete actions can be funded starting with the year 2016-17.

Policy on the Early Researchers Day (ERD)

The Early Researchers Day (ERD) is a two-day workshop for early career researchers in advance of the annual PME conference. The ERD has so far been successfully piloted with at successive PME conferences (2014 in Vancouver; 2015 in Hobart). In order to institutionalize the ERD, it is necessary to develop a policy that defines (1) aims and scope, (2) related financial issues, and (3) the organization and evaluation of the ERD. In order to be able to provide this offer to our early career researchers continuously with the conferences to come, the policy will be ready for voting at the next AGM in 2016.

Matters of external affairs – Call for your ideas on that topic!

The PPG group is seen as being responsible for matters of internal and external affairs of the PME. Whereas the field of internal affairs is relatively clear and deals with issues of membership, policies, etc., the field of external affairs is – at the moment – not very well defined. Of course, we have a close connection to the sister organization of the North American chapter of the PME (known as PME-NA). However, we know that various regional working groups define their aims as relating to the work of PME as well, but we do not have systematic information on that and cannot provide information on this 'hidden' network to our members. Moreover, PME is in the programme for the next ICME in Hamburg in the form of an invited lecture (to be presented Rina Hershkowitz, Israel, and Stefan Ufer, Germany on the topic *PME is 40! Four decades of research in PME*), together with a 90-minute session as an affiliated organization.

This raises the question of whether PME should we build up more explicit connections to other international or regional organizations. As you can see, we have a lot of questions and are curious for your thoughts on this topic. What kind of relations do we have – or should we foster – to other scientific organizations or groups? We would be happy for some input on facts, ideas, wishes, etc. So, please do not hesitate to contact us if you can contribute!

Anke Lindmeier, leader of the PPG
(lindmeier@ipn.uni-kiel.de)

PME 39 Report

First timers' guide to PME

Submitted by Pamela Stott

Hi, my name is Pamela Stott. I have been a secondary mathematics teacher at Pymble Ladies College in Sydney, Australia for 4 years. Having left a corporate career in 2009, I returned to full time study at the University of Technology (UTS) in Sydney to complete a B Teach degree in secondary education (mathematics). I fondly remember my mentor at UTS, the wonderful Associate Professor Anne Prescott, telling me that she always made an effort to attend a PME conference whenever possible and that I should do the same if I ever had the opportunity. Anne considers PME to be amongst the elite of the mathematics education conferences, and so when I saw that PME 2015 was to be held in Tasmania, I made a proposal to my school to attend.

I went to PME with an open-mind, but having previously attended other research conferences such as MERGA as well as teaching conferences, I was expecting something different. In the lead up to the conference, I waited with anticipation to view the list of proceedings and was wide-eyed at the sheer number and variety of seminars / workshops / plenaries and poster presentations. I always try to set a 3 goals for a conference; the first being to take home a few "gems" for reflection which hopefully validate your own thinking but might broaden it too, the second being to enjoy some quality conversations and expand your network and finally, I want to come away thinking feeling enthused by the seminars I attended and being able to take the ideas forward.

And so, to cut to the chase, here is my first timers guide to a PME and these are my observations. As with all good things in life, there were some experiences to treasure, and perhaps some things that could be changed:

(1) Absorb yourself in the lexicon of research early on. Perhaps I was underprepared for this. It seems there are "affordances" to be found in every seminar. But with a little 'reflective abstraction' and a few 'misperceptions', my 'zone of proximal development' remained intact.

(2) It is important to put yourself out there and talk to people. Set yourself a social goal. It did take a while to have a quality conversation and make a connection, but persevere and you will find those who share your passions. The first timers' session was too full so we couldn't attend, but we were lucky to find Keith Jones and Julie-Ann Edwards who welcomed us early on to be part of the PME community.

(3) Process vs outcome. I was fully expecting that researchers would be wholly focused on improving the quality of mathematics education. So I was surprised at experiencing "career" researchers who were focused on the process of research in and of itself, rather than to understand how learning takes place and support the improvement of mathematics education in the actual classroom. Am I expecting too much as a teacher?

(4) Expect the tactical and occasionally the magical. Change / improvement is generally crafted over time and not delivered overnight, but again – there seemed to be a lot of overlap in terms of research that is taking place. But I was inspired by some original thinking, such as the work in collaborative on-line tools and shifting the emphasis toward a structural description of teacher's knowledge.

All in all, it was a fabulous week and my goals were met. I was inspired by the PME community and I came back to the classroom enthused about 'reflective abstraction', and attended many quality seminars. Thanks for having me!

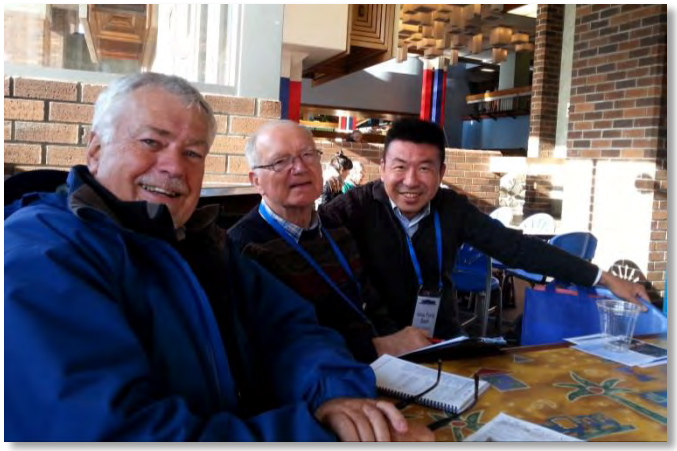
Discussion Group Report: Connections Between Valuing and Values: Rethinking Data Generating Methods

Submitted by Philip Clarkson (Australia)

The Discussion Group was organized by Philip Clarkson (Australia), Alan Bishop (Australia) and Wee Tiong Seah (Australia). We were ably helped by Annica Andersson (Sweden), who in the end was unable to attend the conference.

The goal of the Discussion Group was to explore the use of a different method for collecting data when considering values and valuing in the context of mathematics education. We had suspected for some time that, although the methods we had employed in the past (surveys, classroom observations and interviews) were valuable, more was needed. We also wondered whether, instead of our long-term focus on values, this should shift and/or be enlarged to focus on valuing. This contemplated change had helped us think again more about learners/ learning, rather than just teachers and curriculum, but also of the complexity/coherence that exists in these links. To this end we posed for ourselves two pivotal questions for consideration:

- How can you tell if someone is valuing something, and what if that something is a specified value?
- What does it feel like, in the moment, to be valuing a specific identified mathematical value, and what are the behaviors that are seen by observers in that moment?



These suggested that a more nuanced approach to observing students, and also teachers (as learners), was needed, looking for systematic patterns of valuing particular behaviors. We decided to concentrate on behaviors that students may be privileging that would be linked to mathematics per se such as the six mathematics values identified by Bishop (1988), but may also include what we have earlier identified as values associated with their learning of mathematics (e.g. *fluency*, *understanding*).

We therefore began to wonder whether using role-playing as a method for collecting data, rather than as a teaching tool, might be a worthwhile avenue to explore. Having used role-plays when considering values in some professional development sessions with both teachers and research students, it seemed to hold promise. Thus, we sought to explore within the Discussion Group two fundamental questions:

Discussion Group Report: Connections Between Valuing and Values: Rethinking Data Generating Methods (continued)

- Can one learn mathematical values by initially role-playing them?

- Thinking of role-play as method, does this allow research observers to see the observable valuing traits?

Hence, this Discussion Group did not explore more effective ways to teach or help students learn. Rather, we explored with colleagues whether playing out given roles can give us, as a group, insights into the behaviours we should be focusing on when conducting research into mathematical values and valuing in classrooms. We suspected that, in having to think through just what are the valuing behaviours that a specific mathematical value evokes, in having to inhabit the feelings that goes with this behaviour, and in playing out that valuing behaviour to an audience, these give both the player and observer a much deeper appreciation and understanding of what they are dealing with when mounting research investigations concentrating on valuing specific mathematical values.

During the first third of the Day 1 session we very briefly reviewed some of our own past research on values and valuing and invited colleagues to give accounts of what research they and their peers were presently involved with, and were planning in this area. Of the 16 plus present in the Discussion Group about half took the opportunity to update their colleagues in this manner. Having set the scene we then turned our collective attention to the data gathering techniques we had used. Not surprisingly, virtually all projects mentioned had used surveys, classroom observations, interviews, or some combination of these, with a heavy reliance on surveys. We agreed that there was a need to explore the possibility of using different data gathering techniques.

The last third of the session was devoted to preparing for a role-play to be enacted on Day 2. We needed three groups of players; students, research observers and the teacher. With one of the organizers already identified as the teacher, we needed to have eight volunteers to play students, with the remainder of the group becoming research observers. In fact we had no problems in have eight colleagues volunteer as students. The group then divided into two groups with organizers working separately with the students and research observers.

Within the student group, it was indicated that each student would be asked to play a role that emphasized one of the following eight values: Rational, Empirical, Control, Progress, Openness, Mystery, Technology or Networking. A group discussion ensued which briefly fleshed out what behaviour might be linked to each of these values. Each student then voluntarily chose one of these values to play out in the 'lesson' they would participate in during Day 2. They were then each given separately a short paragraph developed by the organizers that briefly described possible behaviours associated with their value. These paragraphs augmented the discussion just held with the students. They were then tasked, before the next session, to consider further what behavioural practices (hence not just one-off behaviours) they could act out during the teaching session. In essence: what behaviour will you perform which is associated with, or is determined by, a person who is enacting this particular value?

Students were asked not to discuss their role or their role description, with anyone before the next session. They were also asked to assume that the lesson occurs early in the school year

Discussion Group Report: Connections Between Valuing and Values: Rethinking Data Generating Methods (continued)

so that the teacher does not yet know the students all that well, nor do most of the students know each other well.

While the students were meeting, other organizers met with the research observers. They were also given a list of the eight values and were told that each student would select one of these values and would attempt to role-play the value during a pseudo lesson during Day 2 of the Discussion Group. As with the students, a discussion was lead with the observers as to what behaviours they would expect to be linked to each of the values. The observers were asked to further think through what behaviours they would consider point to the different values that the students would be enacting in the teaching session, and write out their own paragraph of the sort of behaviours they think the students would enact during the lesson that would portray one or more values. They were asked to take this with them and work on it further before Day 2. A further point of discussion was what they, as observers, could be expected to do during the teaching session. It was noted that during the lesson they would be observers only and have no interaction with the students. It was decided that they should make a note of:

- What value was 'Fred' (one of the students) enacting?
- What was it that you observed that suggested this behaviour be associated with that value?
- Was there a critical incident in the flow of the lesson that made the association of the behaviour and value more obvious for you?

Both students and observers were also informed that, after the lesson concluded, it was planned to ask observers to decide which pair of students they would want to work with. There would be a short period of time when the observers would engage the pair of students in discussion re the value(s) they portrayed in the lesson, and what behaviours they had observed which suggested this or that value. It was emphasized that all such discussions should centre on the values portrayed and no comment on the quality of performance was appropriate.

Day 2 started with the eight students all attending, which was excellent. Although now missing three of our observer researchers who had to leave the conference early, we had some six extra colleagues attend who were not there for Day1 and hence had not been prepared for the role-play. We partnered the new-comers with returning observers and hoped they would catch up, which they all appeared to do so. Wee Tiong Seah, our teacher, gave a 30-minute informative lesson on linear equations, refusing to be lead astray by some ebullient students, but succeeding in drawing all students into the conversation for part of the lesson.

Instead of breaking into smaller groups of students / observers, given the overall number in the Discussion Group and the presence of the 'new comers', we stayed as a whole group for the discussion. This proved to be a lively for some 45 minutes, focusing particularly on

- What value was this student enacting?
- What behaviours that were observed point to this behaviour of the student?

Discussion Group Report: Connections Between Valuing and Values: Rethinking Data Generating Methods (continued)

Indeed, it was interesting that most observers were able to correctly assign values to students. However, although for some values there was a real consensus on what behaviours lead to particular assignments, for others there was no real consensus and yet a nebulous understanding that such-and-such an assignment was correct. Students seem to have little difficulty enacting their assigned values. In passing, it was of interest that the students came from a variety of cultures and this seemed to have little bearing on what they understood would be the appropriate behaviour for a particular value.

The discussion was then moved to focus on 'What have we learnt from this exercise?' and then 'What are the future possibilities?' Overall the exercise seemed to refresh most colleagues' thinking on this issue. It appeared that in putting them in a quite different context to any they had experienced before drew from them a reviewing of their own thinking and at times uncovered underlying hidden assumptions; that is, assumptions they had never recognized, or had not examined for some time. Hence, the exercise seemed to bring forth new thinking at a personal level within the group. This pointed to a wondering as to whether this exercise could be excellent when working with research students. There was also a feeling that indeed this approach to data gathering could find its way into projects, although more thinking is needed as to the contexts which would prove to be beneficial. For it to work well, the planning for the exercise would need to be carefully laid out and time given for (the real) students to reflect deeply on what they were feeling.

Discussion Group Report: Integrating pedagogical and mathematical learning in pre-service teacher education*

Submitted by Merrilyn Goos (Australia) and Jana Visnovska (Australia)

The aim of this Discussion Group was to explore international perspectives on integrating pedagogical and mathematical learning in pre-service teacher education, an area of lively interest to a wide range of PME participants. Our purpose was to initiate discussion on this theme with a view to instigating collaborations and providing the basis for a proposal for a Working Session at PME40.

The first 90 minute session was attended by 25 participants from twelve countries. Attendants were a mixture of mathematics teachers, mathematics education staff (primary and secondary focus) and mathematics staff, with some who taught both content

* *We gratefully acknowledge the contribution of Michael Bulmer to facilitating the Discussion Group.*

Discussion Group Report: Integrating pedagogical and mathematical learning in pre-service teacher education (continued)

and pedagogy courses. We introduced the session with a synopsis of interdisciplinary approaches to mathematics pre-service teacher education, and their conceptualization based on communities of practice perspective that is being used and developed in an Australian multi-university project – *Inspiring Mathematics and Science in Teacher Education*.

Small groups were formed to (a) discuss how pre-service teacher education is organised in different countries and institutions, and (b) identify types of collaborations across mathematics and mathematics education departments that they found worthwhile. Participants shared types of barriers to fruitful collaborations that were typical in their settings. The group agreed that goals for pre-service teachers' mathematical learning shape how this learning is structured. High value was placed on pre-service teachers' development as *authentic mathematicians*. Examples of relevant experiences included engagement in problem-solving process ('doing mathematics') and learning about themselves as mathematics problem solvers. Issues of effective pedagogical approaches, appropriate assessment activities, and helping teachers become aware of their own progress as mathematics learners were flagged as being of central importance in courses with this focus. Concerns were raised about the multiple ways in which current content courses have a strong tendency to reinforce procedural learning.

Nine participants from six countries attended the second 90-minute session. We summarized the themes that emerged from the first session and posed critical questions for further discussion. Participants strongly agreed that in addition to documenting and comparing mathematics teacher education systems in different countries and institutions, identification of shared research questions that could be investigated in these different contexts was important. Throughout the sessions, the issues discussed were portrayed as presenting a concern to mathematics teacher educators across different countries and institutional contexts, even though specific concerns and barriers varied. Most participants indicated interest in continuing discussions by providing their contact details at the end of the second session.

Mathematics Education: How to solve it?

Learn more about PME 40 in Szeged, Hungary on page 20.

Working Session: International Integer Curriculum Comparison

Submitted by Laura Bofferding (USA), Nicole Wessman-Enzinger (USA)

The PME 39 working session, International Integer Curriculum Comparison, was co-organized by Laura Bofferding and Nicole Wessman-Enzinger. The idea to compare curriculum materials (e.g., textbooks, scope and sequence) among different countries arose from our discussion group at PME 38 (Bofferding, Wessman-Enzinger, Gallardo, Salinas, & Peled, 2014).

Summary of Session 1

During session 1, we talked about current issues in negative integer research with an intimate group. The conversation focused on young children's changing mental models of integer order and values and how their whole number knowledge can both support and interfere with their learning of negative integers. We discussed some general observations we had regarding curricular materials – the scope and sequence – for teaching integers. In particular, there seems to be a lack of attention paid to absolute value and directed magnitude when integers are first introduced. We also discussed the problems types (e.g., -2 + 3, -5 + -8) that may be introduced first in curricular materials. Additionally, we discussed resources teachers in Australia might use when teaching integer operations. Although a common textbook does not seem to be adopted in Australia, there are some popular texts and websites where teachers look for information. The sites discussed during the session included the following:

1) Scootle
https://www.scootle.edu.au/ec/p/home

2) Quest
http://www.jaconline.com.au/mathsquestnsw

3) ICE-EM
http://cambridge.edu.au/go/series/?pid=41

Summary of Session 2

During session 2, after talking around the question, "What is your stance on 'good' curriculum?" we shifted our focus a bit. We talked more specifically about some of the contexts used in integer problems and some popular models for teaching integer operations. Specifically, we addressed the following questions:

- What are the underlying issues with models for integer addition and

Working Session: International Integer Curriculum Comparison (continued)

subtraction?

- What are theoretical perspectives about using models of instruction for integer addition and subtraction?

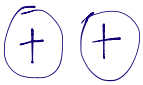
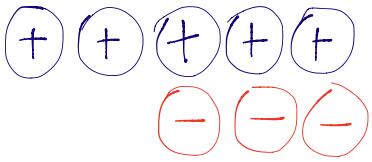
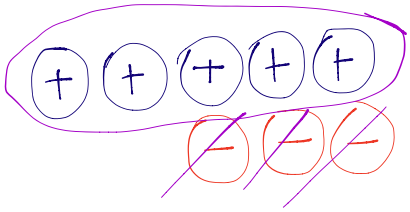
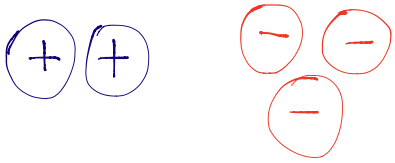
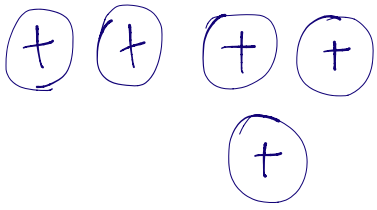
During this work, the need to investigate the epistemic fidelity of integer instructional models (Stacey, Helme, Archer, & Condon, 2001) emerged. We each shared different typical models utilized in our home countries. The focus of our work funneled to examining the differences in the chip model for teaching integers between the United States and Singapore. Table 1 highlights the difference between the "chip model" between the US and Singapore for 2 – -3.

Next Directions

We are moving forward by documenting the affordances and limitations of different integer instructional models (based on their use in different countries).

Table 1

United States and Singapore Chip Models for 2 – -3

United States	Singapore
To complete 2 – -3, the US Chip Model includes the addition of "zero pairs."  Zero pairs (two different colored chips) are added to the model to complete the subtraction.  After three chips representing -3 are removed, the chips are added together. 	To complete 2 – -3, the Singapore model includes "flipping" some of the chips and adding them.  The negative chips are flipped over and the sign is changed.  The chips are added together.

Working Session: International Integer Curriculum Comparison (continued)

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Working Session: Mathematical Discourse that Breaks Barriers and creates space for marginalised students

Submitted by Marta Civil (USA), Roberta Hunter (New Zealand) & Núria Planas (Spain)

The aim of the working session at the PME 39 conference was to build on and continue the dialogue which emerged from the 2014 Discussion Group 3 (Civil, Herbel-Eisenmann, Hunter & Wagner, 2014). Our goal was to work together to construct chapter outlines of a book that explores how barriers to the discourse have been identified and spaces created for different groups of marginalised students across a range of countries. Although a clear focus was placed on developing collaborations towards contributing chapters for an edited book which related to the topic, other goals for the two sessions were also considered. These included bringing together researchers to develop a research agenda for future work in this field; to provide space for researchers in this field to discuss their research projects; and to support researchers with an emerging interest in the topic of this Working Group to have an opportunity to gain understandings of relevant conceptual frameworks and types of research being undertaken in this field.

The Working Group was led by three researchers and approximately twenty-five participants attended the first and the second session. The first session began with a brief overview of how two frameworks were used in the 2014 Discussion Group 3 as an analytical tool to critique video footage of the mathematical discourse used by a group of students of Mexican origin in the U.S. as they engaged in problem solving in their home language (Spanish) (Civil, 2012). These Frameworks included a Communication and Participation Framework (Hunter & Anthony, 2011) and a Framework which centered on authority structures within the classroom (Herbel-Eisenmann & Wagner,

Working Session: Mathematical Discourse that Breaks Barriers and creates space for marginalised students (continued)

2010; Wagner & Herbel-Eisenmann, 2014). The participants were then invited to discuss and share their own experiences and research related to how barriers to mathematical discourse had been identified and/or spaces created for the different groups of marginalized students they had worked with. The lively discussion provided evidence that there is considerable interest and work being done within this research focus. It also led to a broadening of our view of the students which belonged within this group (for example, we added students with disabilities). Two brief presentations were then provided by Roberta Hunter (New Zealand) and Robyn Jorgenson (Australia) from different perspectives about their work with indigenous and immigrant students. These presentations were used to begin the conversation to explore headings which might be used to comprise chapters for a book which explores how barriers to the discourse have been identified and spaces created for different groups of marginalized students across a range of countries. Possible themes which emerged included:

- Teacher education and teacher preparation
- Student's voice / participation
- Policy
- Parents / family
- English as an additional Language
- Indigenous; immigrants; low income; urban; rual

The second session began with three short presentations by Núria Planas (Spain), Mellony Graven (South Africa) and Christina Krause (Germany) which aimed to widen the possible focus of chapters themes (hearing impaired students; indigenous low income) for the proposed book. The participants then continued to work in small groups to develop possible collaborations for book chapters and to begin to shape the proposal for the book.

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Working Session: The building and research of thinking classrooms

Submitted by Peter Liljedahl (Canada) and Gaye Williams (Australia)

The organization of this working session actually began in Morelia, Mexico in 2008 as a conversation between the two organizers at PME 32 in Morelia, Mexico. The conversation continued through the years until PME 36 in Taipei, Taiwan when the decision was made to act on it. The result was a DG at PME 37 called *Building a Thinking Classroom*. Our activities at that meeting were centered on the identification of salient characteristics of thinking classrooms, as well as the co-construction of a definition of a thinking classroom:

> *A classroom that is not only conducive to thinking but also occasions thinking, a space that is inhabited by thinking individuals as well as individuals thinking collectively, learning together, and constructing knowledge and understanding through activity and discussion. It is a space wherein the teacher not only fosters thinking but also expects it, both implicitly and explicitly (Liljedahl, in press).*

This emergent definition of a thinking classroom intersects with research on mathematical thinking, classroom norms, notions of a didactic contract, the emerging understandings of studenting (Fenstermacher, 1994; Liljedahl & Allan, 2013), knowledge for teaching (Schulman, 1986), and activity theory.

At the end of the DG at PME 37, the participants suggested that they were not ready to shift to a Working Session (WS). As such, at PME 38, we offered a DG again – this time with a focus on Researching Thinking Classrooms. A number of categories of researchable questions emerged from this DG, including: a) what type of content (e.g., tasks etc.) promote a Thinking Classroom? b) what are the tools (including competencies) that enable teachers to transition to a Thinking Classroom? c) how do teachers initiate and sustain Thinking Classrooms? d) how does thinking stop in a classroom and why does it stop? e) What techniques give the most engagement? F) given a Thinking Classroom, what are the outcomes?

At the end of the DG at PME 38 one international group of researchers excitedly shared that they were ready to undertake a project together. Others declared that they are ready for a WS to develop their research design. In response, at PME 39, we lead a WS called The Building and Research of Thinking Classrooms. The two WS sessions were focused in the following ways:
Session 1 (20-25 participants): As a way to orient the participants, the session began with a presentation of the aforementioned definition and a Wordle http://www.wordle.net emerging out of the DG at PME 37.

This was followed by a brief presentation of some results emerging out of some of Liljedahl's research (Liljedahl, in press). The participants then broke into small groups to discuss and generate researchable questions on the topic of Thinking Classrooms. This was followed by a gallery walk and a whole group discussion.

Session 2 (15-20 participants): This session was initiated by Williams sharing video of the Science of Learning Research Classroom at the University of Melbourne. This was followed by small group discussion in which the task was to generate research questions that such a research space would afford us in trying to answer. This was concluded with a sharing out activity and a plenary discussion.

Working Session: The building and research of thinking classrooms (continued)

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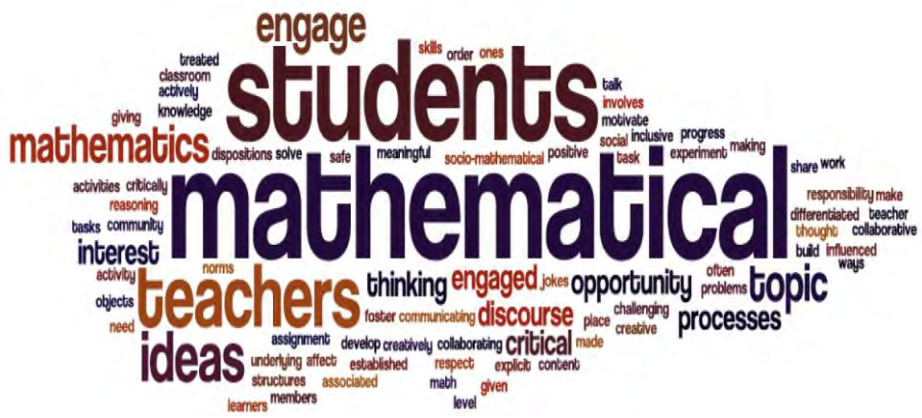

Figure 1. Wordle of terms used by participants in defining Thinking Classrooms

Working Session: Special Education and Math

Yan Ping Xin (USA), Michael Meyer (Germany), Xuan Yang (USA), Louise Rogers, Janeen Lillas (Australia), Fiona Witcomb

After self-introduction of each of the participants, Dr. Yan Ping Xin, the Coordinator of this working group, presented a brief history of this working group as well as the rationale and goal of this working group - a need to promote collaborative work between researchers and educators from both the fields of math education and special education. The session surrounded several discussion points. First and foremost, the group clarified the definition of students with learning disabilities or difficulties. To this end, Dr. Xin shared the Response to

Working Session: Special Education and Math (continued)

Intervention (RtI) movement in the United States, which has transformed the traditional practice of identification of students with disabilities or special needs - RtI promotes the idea of early intervention along with continuous progress monitoring to inform the instructional planning.

Secondly, the three special education classroom teachers, as part of this WG session, shared with the group their classroom teaching experiences and the challenges they encounter - there is definitely a need for the research community to support the classroom teaching with research-based best practices. To this end, the researchers in this working group shared their recent innovative research and how that could inform classroom teaching and practice.

Finally, session coordinator Dr. Xin shared with the group the status of the special issue (to be published in a leading journal in the field of special education) this working group had been pursuing. In addition, she proposed another potential outlet - publishing a book to facilitate broad dissemination of the work resulting from this working group. During the session, ideas were solicited from this working group in terms of (a) what would be the selling point of this potential book, and (b) what features/content school teachers would like to see in this book.

Concerns and suggestions for future conference

One concern is about the scheduling of the sessions: the set schedule of this working group was in conflict with two other sessions that involved a few key participants of this working group. For instance, Ron Tzur was registered as one of the authors of this working group; however, a research forum where Tzur was the leading author /presenter was scheduled at exactly the same time. This scheduling conflict prevented Dr. Tzur, and a few other people, participating in this working group session. Another concurrent working group session, "Mathematics discourse that breaks barriers and creates space for marginalized students" also created a scheduling conflict for some participants. In future conference scheduling, we hope that the conference organizers can pay more attention to potential schedule conflicts to promote maximum participation of each of the conference sessions. Thank you for your consideration.

PME 39 Seminar Report: Reviewing for the PME – A primer for (new) reviewers

Submitted by Anke Lindmeier (Germany)

Seminars are intended to provide specific courses for the professional development of PME members. This workshop format was introduced in 2008 at PME 32 in Morelia but has rarely been used so far. The offer of a seminar on the topic of 'reviewing for PME' was triggered by ongoing discussions on the specialties of reviewing for PME, especially in comparison to review procedures for other conferences or journals.

PME 39 Seminar Report: Reviewing for the PME – A primer for (new) reviewers (continued)

The seminar was intended to provide information about the PME review process and give the opportunity to gain first experiences in providing a high-quality review. The seminar addressed especially the needs of new reviewers, although experienced reviewers were very welcome in order to facilitate knowledge transition within the PME community.

The seminar included an introduction to the intention and purpose of reviewing from a more general perspective, but also detailed aspects of the PME review practices. The goals were accordingly: Participants should (1) be informed about reviewing as an aspect of scientific quality management, (2) get to know about the most important differences in reviewing procedures for journals and conferences as well as different types of contributions, especially in the PME context, (3) be able to differentiate the specific review categories of PME, (4) be able to identify aspects of quality for a review, and (5) be sensible to aspects of fair, constructive, and inclusive reviews.

Due to a small, but substantive number of participants, we could adjust the pacing and focus of the seminar according to the needs of the participants. In general, we could identify three different kinds of motivation to participate: new reviewers in search for a reviewing primer (our main target group for the seminar), experienced reviewer in search for a refined understanding of the reviewing practices, and future prospective conference organisers in search for a comprehensive overview of reviewing practices. The needs of all three groups could be addressed in the seminar, although in future it might be interesting to differentiate between the groups of reviewers and prospective conference organizers.

As the professional development of the PME reviewers is an ongoing demand, we would suggest that this kind of seminar could be offered at future conferences. It was suggested that the scheduling of seminars in parallel to the other group activities might be reworked in order to avoid conflicts between professional development and scientific activities.

PME 40 is contributing to ICME-13

PME 40, 2016

Mathematics Education: How to solve it?

Szeged, Hungary hosts PME 40

The Local Organizing Committee of the 40th Annual Meeting of the International Group for the Psychology of Mathematics Education is pleased to invite you to attend the conference to be held in Szeged, Hungary from August 3 to August 7, 2016.

Mathematics Education: How to solve it? has been chosen as the title of the conference. This title reminds all participants that 70 years ago the Hungarian Pólya György (George Pólya) published his seminal book entitled "How to solve it?". This book was used by generations of mathematics teachers as their inspiring source of teaching ideas. Besides commemorating Pólya's oeuvre, the title evokes the everlasting debate on the role of mathematical problem solving in fostering children's thinking.

The plenary speakers will address various issues and facets of mathematical problem solving. In accordance with PME tradition, the then retiring president Barbara Jaworski from Loughborough University, UK, will talk about using heuristics to promote learning of mathematics for all, taking equity issues into consideration. Having worked for more than 40 years on how we can build on Pólya's insights, Alan Schoenfeld from the University of California, Berkeley, will give a lecture on learning environments that produce powerful mathematical thinkers. Other aspects of mathematical problems solving will be addressed by Roza Leikin from the University of Haifa, Israel, and by Masataka Koyama from the University of Hiroshima, Japan. The plenary panel, as always, addresses the conference theme. The possibility of being taught mathematical problem solving will be discussed in the Oxford Style debate format. The leader of the discussion (Madam Chair) will be Helen Chick (University of Tasmania, Australia), and the four panelists distribute their roles: First Speaker for the Proposition, First Speaker for the Opposition, Second Speaker for the Proposition, Second Speaker for the Opposition. The four panellist will be: Miriam Amit (Israel), Szilárd András (Romania), Markku Hannula (Finland), Berinderjeet Kaur (Singapore). The

Mathematics Education: How to solve it? (continued)

conference website has already been launched: http://pme40.hu

You can find there the First Announcement that gives detailed information about presentation formats, deadlines, and review criteria; and provides an overview of the travel and country-specific issues. It is the second time Hungary hosts the PME Annual Conference. PME 12 was held in Veszprém. Both 12 and 40 are among the most important numbers in Biblical numerology. The Local Organizing Committee has 13 members from different universities, thus making the occasion a national endeavor. The University of Szeged is most proud of hosting such a highly prestigious event. Szeged is most famous of its culture, including the University which is among the 500 best universities of the world. The name of the town is closely intertwined with sport events as well: the Canoe Sprint World Championships were hosted in Szeged three times. Moreover, the town is a gastronomical and spa event itself worth being discovered.

Hope to see you in Szeged next year!

Mathematics Education:
How to solve it?

Colloquium – Please consider submitting at PME 40!

Since PME 39 in Hobart, it was possible to submit a group activity called 'colloquium'. A colloquium consists of 3 related individual research reports, which are scheduled together in one time slot in the program, and which are followed by a discussion initiated by a discussant who has prepared his/her contribution beforehand.

Among the many advantages of this new format, we just want to mention that it may enhance collaboration among researchers, and may stimulate the inclusion of new researchers in a particular domain. For conference participants, the program becomes more structured and coherent, and discussion during sessions can be enhanced and deepened.

PME 39 was a relatively small conference in terms of the number of submissions, and there was no colloquium that was accepted and included in the programme. However, we want to express a warm call to the membership to submit a colloquium for PME 40.

If you can think of colleagues who could sub-

Colloquium – Please consider submitting at PME 40! (continued)

mit research reports that in some way are related to each other (e.g. they depart from related or contrasting theoretical stances, use identical instruments or methods or investigate the same question using different methods, focus on closely related research questions, etcetera), we would like to invite you to submit these research reports in the form of a colloquium for the next PME conference.

A colloquium proposal consists of a set of (exactly) three research reports, to be presented by members from at least two different countries, and includes in addition a one page summary by an organizer, indicating a specific pre-determined focus that is present in each research report.

The deadline for proposals of colloquia is the same as that of research reports. The three separate research reports that comprise the colloquium have to be submitted via the normal procedure, and the organizer additionally submits a one page summary of the theme and the goals of the Colloquium, including mentioning the person who agreed to be discussant. The research reports included in a colloquium proposal are reviewed in the usual way, but at least one reviewer will consider the colloquium in its entirety. If the colloquium is not accepted as such, the individual research reports can still be accepted in the usual way. Thus, there is no risk involved in trying to submit in this new format as compared to submitting an individual research report.

We hope to see many positive reactions, and many interesting colloquia presented at PME 40 in Szeged.

"Cathedral of Szeged" by Gyorgy Kovacs
https://www.flickr.com/photos/32050584@N06/2999420938
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"Szeged city hall" by Lennert B
https://upload.wikimedia.org/wikipedia/commons/6/66/Szeged-varoshaza-01.jpg
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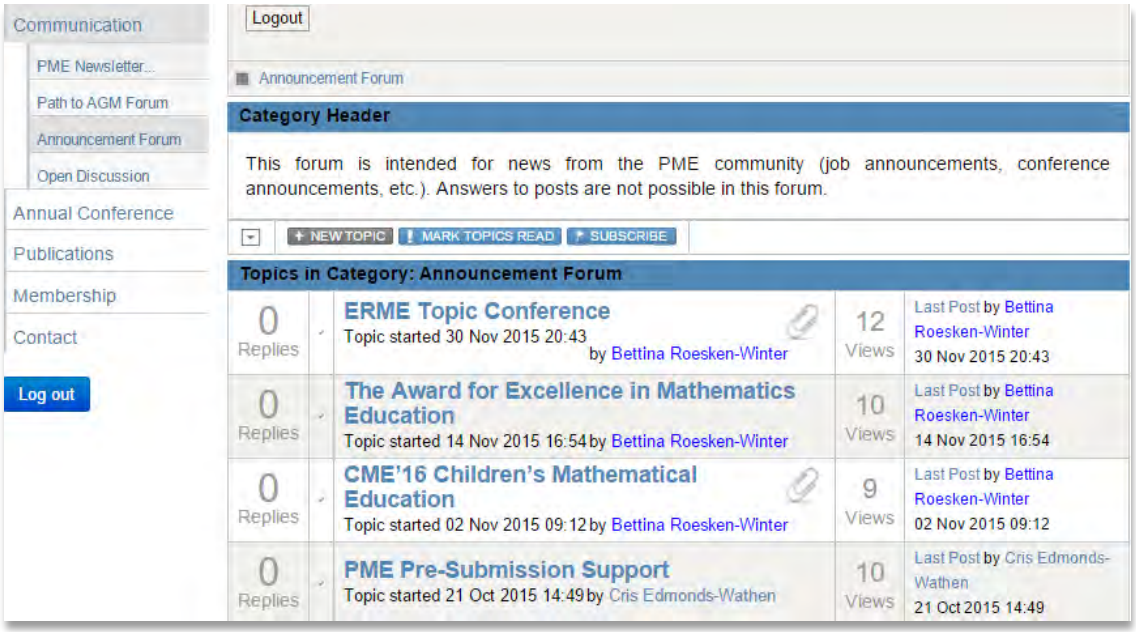
Announcements

PME Announcements Forum on the PME Website

The IGPME website (www.igpme.org) is the main portal for all communication and information regarding PME. A useful feature for PME members is the Announcements Forum as this is place to post items of information for PME members such as job announcements, conference announcements, and so on. To access the Announcements Forum, please log in with your 'conftool' log-in details. You can then find the forum in the 'Communication' section.

Since the previous PME Newsletter, the following items have been posted on the PME Announcements Forum:

- The first ERME Topic Conference is revealed: "Mathematics teaching, resources and teacher professional development". http://igpme.org/index.php/forum/announcement-forum/133-erme-topic-conference
- The Texas A&M University calls for nominations for the "Award for Excellence in Mathematics Education". http://igpme.org/index.php/forum/announcement-forum/131-the-award-for-excellence-in-mathematics-education
- An invitation to participate in the bi-annual conference on Children's Mathematical Education was released. http://igpme.org/index.php/forum/announcement-forum/125-cme-16-children-s-mathematical-education
- Submissions are now invited for PME pre-submission support. http://igpme.org/index.php/forum/announcement-forum/124-pme-pre-submission-support



Miscellaneous

An invitation to join HPM

Submitted by Luis Radford (Canada)

HPM - the International Study Group on the Relations between the History and Pedagogy of Mathematics - brings together mathematicians, historians of mathematics, mathematics education researchers, teachers, philosophers, epistemologists, and educational policy makers. Two of its main aims are: (1) To promote an interdisciplinary and cultural approach to mathematics in order to better understand the emergence and cultural evolution of mathematics; (2) To stimulate research about the manners in which the history of mathematics can enhance the teaching and learning of mathematics at all levels and assist the development of curricula. HPM organizes two main conferences that alternate every two years:

- Satellite meetings of the International Congress on Mathematical Education (ICME) devoted to the history and pedagogy of mathematics
- European Summer Universities on the History and Epistemology in Mathematics Education (ESU).

The last ICME HPM satellite meeting was held in Daejeon, Korea, in July 2012. The last European Summer University on the History and Epistemology in Mathematics Education was held in Copenhagen, Denmark, in July 2014. The next conference is the **ICME HPM satellite meeting**. It will take place in Montpellier, **France**, from **July 18 to July 22, 2016**. We invite you to join us. Featuring a relaxed and inclusive atmosphere of discussion and exchange, the ICME HPM satellite meeting will include plenary lectures, discussion groups, workshops, research presentations, and posters.

You can follow us by visiting our webpage: http://www.clab.edc.uoc.gr/hpm/about%20HPM.htm. You can also subscribe to our Newsletter, which is published three times a year: http://www.clab.edc.uoc.gr/hpm/NewsLetters.htm and send your subscription request to Helder Pinto: hbmpinto1981@gmail.com.

Who we are

HPM emerged from one of the 38 Working Groups organized at the second ICME, held in Exeter, UK, in 1972. In 1976 HPM became affiliated with ICMI (International Commission on Mathematical Instruction) during ICME-3 in Karlsruhe, Germany, the same year that The International Group for the Psychology of Mathematics Education (PME) became affiliated with ICMI as well. HPM publishes the Proceedings of its conferences. Some of these Proceedings are available on line free of charge. They can be downloaded at: http://www.mathunion.org/icmi/digital-library/aos-conferences/

We hope to see you in Montpellier, France, in 2016!

Luis Radford
HPM Chair