



NEWSLETTER

International Group for the Psychology
of Mathematics Education

March 2021

In this issue

PME Virtual Meeting 3

Virtual WG Reports 4

IC Reports 8

Open Contributions 11

PME Forum 12

Message from PME President

Dear Friends at PME,

the year 2020 has been exceptional in many ways, also for PME. We had to postpone our annual conference by one year. However, we organized a smaller online event at the same time, with interesting presentations, working groups, and the annual general meeting of PME. We were amazed by Maitree's team in their ability to rapidly organize this virtual event.

The PME international committee also made the difficult decision not to organize elections of new members for the international committee, because we did not feel sufficiently prepared to organize a fair election online. Our retiring members agreed to continue one more year, for which we are very grateful. This will cause irregularities for future elections of the international committee. We have already outlined a solution for how to return to normal election cycle.

The year 2021 has begun with a promise of a better future. Specifically, the rapid development of the COVID vaccine will soon give us back our freedom to move and meet people without fear of spreading a deadly disease. It remains to be seen how long it takes before our scientific communities are able to meet again at conference venues. Maitree and his team in Thailand are prepared to welcome guests who can travel in July.

(continued on page 2)



Message from the Editors

While Covid-19 keeps the world on tenterhooks, researchers around the globe are affected very differently. While some may even be more productive, others are consumed by an extra load of (online) teaching, are suddenly responsible for taking care of their children in parallel to their work, need to worry about their family's health, or are even directly affected by Covid-19.

To overcome these challenges, to receive support, or to 'simply' experience social relatedness in times of growing isolation, communities are especially important. (continued on page 2)

Message from the PME President (continued)

However, in the face of uncertainties, PME has decided to organize the event as a hybrid conference. You PME members have a choice to present your paper either at the venue in Thailand or online through videoconferencing. Moreover, you can wait until April before you need to make that important decision. We are deeply grateful for Zehavit and her team at the Technion for taking the responsibility for organizing the virtual component of the conference.

The virtual meeting in 2020 and the forthcoming hybrid conference in 2021 may well serve only as a starting point for active online collaboration between PME membership. There is growing concern for carbon emissions and many members would prefer to limit their travels also in the future. How to continue online activities in the future is an important discussion that PME members should have.

On the last days of 2020, we received information from the UK Charity Commission. They had accepted PME as a charitable organization under UK law. After long time of being an 'anarchistic' group with no legal status, we are now a legal entity. This is an important development for us as an organization. PME can now

safely continue handling funds and making financial transactions without risk of being accused of money laundry. Being a charitable organization also makes it possible for us to search funds to support our activities. I wish to acknowledge the important role of many people in this long process. Barbara Jaworski as PME president at the time started this process. Peter Liljedahl, under his term as the PME president continued the process and worked hard on getting our constitution to meet the requirements of Charity Commission. Several IC members over the years have contributed to the process, but I wish to name two here. At the last stages of the process, Laurinda Brown first and Tracy Helliwell after Laurinda's retirement were important in taking care of the practicalities of the application process.

Looking optimistically towards the future, and eagerly waiting to see you again – be it in Thailand or online.

Markku Hannula
President of the IGPME



Message from the Editors (continued)

In this regard, we hear many voices longing for the next opportunities to meet with colleagues, which for many of us are more than colleagues but long-lasting friends. This year's PME 44 will be such an opportunity. Although hybrid, there will be many meeting opportunities, which we look forward to. We hope to see old friends and at the same time also welcome new members to the community, which currently have an especially hard time to network and connect during these times. We thus urge you to behave, even more than usually, in concordance to the open and welcoming PME spirit and embrace new PME members and participants during PME. As Markku mentions in his credits for Laurinda Brown: Her welcoming spirit from his first conference in 1997 has led to a long, shared history with many nice memories.

Thinking about communities, we also see that researchers from various locations are moving together more closely in these times. Video calls, which were rather exceptional for many, have become routine for most. As editors of the newsletter, we care for the PME community and would be happy if this spirit of international unity would live on, even after the (hopefully soon) end of the Covid-19

pandemic. International cooperation is one of the aims of PME and, besides of all negative aspects of Covid-19, this may be one of the aspects that may be of future advantage.

Closing, we want to take the time and especially thank the IC members that prolonged their time in the IC to serve the community. We are grateful for your work and - at the same time - look forward to the upcoming new IC members, hoping that they will continue your committed path.

As mentioned above, the Covid-19 situation is difficult for many of us, and schedules are tight. This is also the main reason why the issue at hand – which is officially Issue 2, 2020 – could only be published now, in March 2021. Deadlines are hard to keep for contributors as well as editors when home office comes along with home schooling, other responsibilities of care or worries about the health of beloved ones or people around us. Nevertheless, we hope that you enjoy reading this issue and look forward to our next meeting in either digital or even live mode!

Take care and stay healthy!

Maike Vollstedt, Igor' Kontorovich & Daniel Sommerhoff

PME 2020 - Virtual Meeting

Messages from LOC



Submitted by Maitree Inprasitha (PME 44 Conference Chair)

The Local Organizing Committee of the 44th Annual Meeting of the International Group for the Psychology of Mathematics Education (IGPME) would like to thank you for the support and opportunity given to us to host the virtual meeting of IGPME which was held on July 21st to 22nd, 2020.

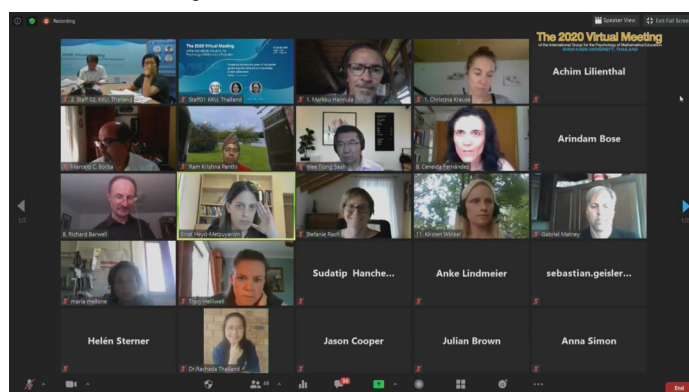


The webinar format of the conference took place through live and recorded presentations due to the global pandemic of the new coronavirus disease (COVID-19). It is very challenging to organize a webinar as we must know how to work with the webinar controls to navigate the control panel and interact smoothly with participants. Besides, we designed the conference program that could accommodate most of the participants from different time zones based on the IGPME committee's suggestions.

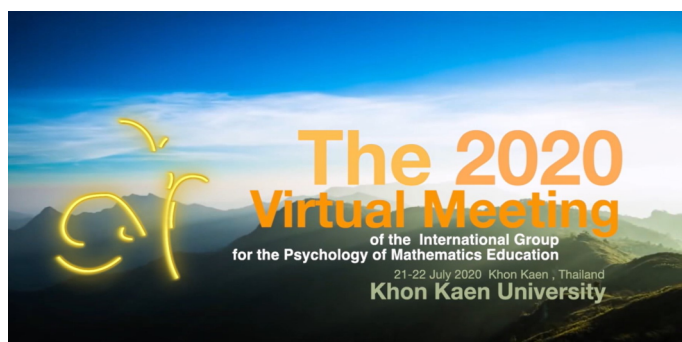
Nevertheless, we must account for technical issues such as electricity and internet stability, are beyond our control. To avoid unexpected problems, we have prepared the electric generator and internet hotspot, which is high quality and stable.



On top of that, our technical team has successfully streamed the Zoom Meeting and Webinar on YouTube. This allowed participants to join our meeting via Zoom, to view and comment on it via YouTube. Moreover, all the video presentations of the conference were created with a new sound to avoid copyright infringement when broadcasting on YouTube.



Finally, the virtual conference was able to reach and engage actively between session chairs, presenters, and participants. This enabled the participants to gain insights through discussions. It is a great pleasure that we had this opportunity to experience the new way of conducting the 2020 virtual meeting of the IGPME effectively. We are looking forward to hosting the PME44 Hybrid Conference.



Virtual Working Group Reports

Embodied Processes in Mathematics Teaching and Learning: Methodological Aspects

Submitted by Anna Shvarts (Netherlands), Chiara Andra (Italy), Markku S. Hannula (Finland), and Christina Krause (USA/Germany)

The role of bodily resources for mathematics teaching and learning has attracted growing attention from mathematics education researchers in the last 20 years. The theoretical interest in gestures, hand- and eye-movements, heartbeats, and voice modulation is strongly supported by the rapid development of research technology in the last years. Previously inaccessible embodied processes can now be detected, measured, and then analyzed, potentially leading to new insights on the role of the body for mathematics learning, at both cognitive and affective levels (Hannula, 2012). Such measures as eye-tracking, motion detection, and automatic recognition of gestures become integral to the newly emerging multimodal learning analytics field (Blikstein & Worsley, 2016). In the future, tracking of multimodal processes, which are detected by a variety of sensors, will enable educational technologies to adjust the teaching process immediately in response to students' behavior. These new technological developments, along with videography as classics of embodied analysis, pose new challenges. While previously affective processes were available only through self-reflection, the methodology of detailed observation and sensors that access heartbeats, skin galvanic reaction, and pupil diameter allows for tracing emotions as feelings. We can now enrich the analysis of gestures by multimodal data and log data from embodied interaction with technologies. These data help us to understand better the roles of gestures beyond means of expression but also as part of the thinking process, e.g. against the background of

considering gestures as simulated action (Hostetter & Alibali, 2008).

In the prerecorded video to the virtual working group, made available online to the participants prior to the virtual meeting, we provided a short introduction on the variety of theoretical visions on embodiment, and then we introduced affective aspects of learning processes and gestures, described a variety of devices that can continuously track bodily processes, and focused specifically on eye-tracking. You are welcomed to have a look at the video:

https://youtu.be/c7MPZd_RFFs

As we consider methodology to be a part of a theoretical triplet, along with principles and research questions (Radford, 2008), we paved the conversation in the working group towards establishing a set of research questions that need to be addressed as we are building new methodologies. During the online sessions, we have been working on an extract from a multi eye-tracking project, which provided information on the students' and teacher's visual attention in the collaborative problem-solving process along with video-recordings of this process.

On the first day, discussions in the small groups aimed to establish connections between the embodied process and mathematics education. The participants investigated what kind of embodied processes and indicators of mathematics teaching and learning can be observed in the data. On the second day, we made the next step and explored the possible research foci and questions in analyzing embodied processes within the provided piece of data. Participants at the discussions highlighted that additional sensors, such as eye-tracking, made the rich video data even more complex and almost



impossible to analyze meaningfully without special preparation. The richness of data increased the request for developing sharp, theory-based research questions, which would guide data analysis.

From the questions raised during the sessions, we identified two main types of the research questions for further work. The first set of questions emphasised embodied processes in students' and teachers' practice. For example, concrete research questions for eye-tracking studies might concern the investigation of teachers' attention to the students' mathematical behavior comparing novice and expert teachers. Such studies could contribute to prospective teachers' learning by informing teacher training. Another example brought up at the group was investigating visual attention of the learners in a variety of settings—such as switches between the computer environments and notebooks or between diagrams and texts. Investigating this issue might contribute to arranging learning environments and placement of the materials. Also, fundamental questions about cognitive processes were raised related to the roles of visual attention in aha-moments and in distinguishing the impact of cognitive processes when students depart from any visual material.

Another type of questions that came up addressed the methodological aspects of studying embodied processes, particularly important for the further development of our working group. One of the questions concerned how we could interpret the data about observable and measurable bodily processes with respect to the entire system of cognitive and affective processes. For example, in application to eye-tracking, such a question would call for developing a research protocol that takes into account that visual attention does not match the focus of the foveal region reported by eye-trackers as in many cases, students and teachers might attend peripheral regions without moving their eyes. Another research question concerned the multimodality of data as a way to resolve ambiguity within one modality: What are the

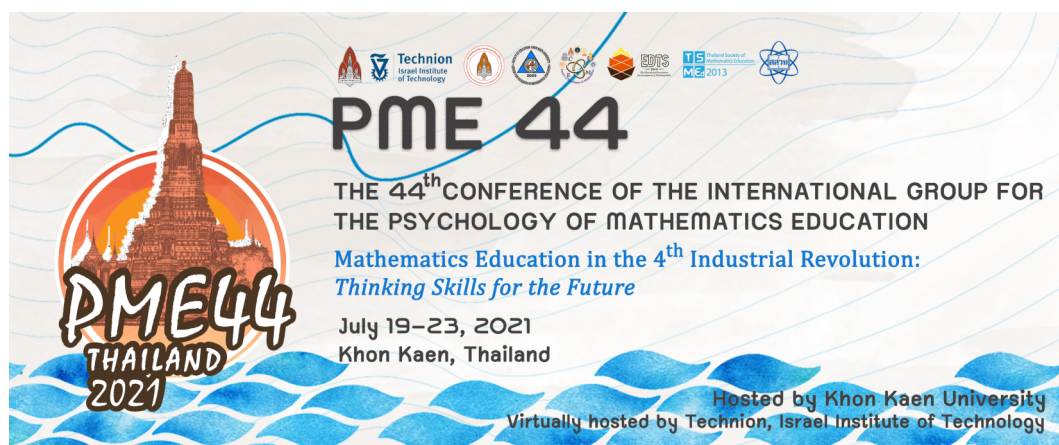
conditions when triangulation of the processes in different modalities can lead to more reliable interpretations?

This year's work was mostly arranged around multiple eye-tracking data, so many issues concerned visual attention. However, the fundamental problem lies in focusing on particular aspects of multimodal behavior and at the same time in an ambiguity of each piece of data taken independently. We see the need to address strategies for resolving this controversy as one of our future work focuses. Novel sensors and technologies that provide access to additional information only make this problem sharper. The rich potential that technological innovations pertain bring forth the complexity of setting up a research question that, on the one hand, would benefit from intensive, highly frequent data and, on the other hand, would help to get oriented in the richness of materials and set up appropriate data analysis. The importance of theoretical frameworks when working with those types of data comes forth as any conclusions are highly interpretative.

In the future, we plan to continue this line of collaboration around methodological aspects of embodied processes. One of the aims will be submitting a Research Forum for a future PME. The PME members who are working with embodied data and would like to participate in such a forum are welcomed to contact us.

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Innovating the Mathematics Curriculum in Times of Change: Towards Local and Global Relevance?

Submitted by Julian Brown (United Kingdom), Alf Coles (United Kingdom), Tracy Helliwell (United Kingdom), Kate Le Roux (South Africa), Maria Mellone (Italy), Oi-Lam Ng (Hong Kong), Armando Solares (Mexico)

This on-going Working Group aims to instigate dialogue around how mathematics education can make itself 'relevant' (locally and globally) in a changing world. We ask this while also troubling notions of authority and legitimacy in relation to mathematical and scientific knowledge. We want to explore: What kind of mathematics curriculum has local and global relevance, across a range of contexts? And, on what authority? What are the processes of curriculum innovation, in diverse contexts? And, how can researchers in diverse settings learn from each other in answering these questions? In the writing below, we set out some of the background to these questions and the outcomes from our virtual meetings at PME in July, 2020.

We live in an era of economic, political, and ecological change that requires rethinking of relations between humans, and between humans and the material world. Climate change, resource depletion, poverty, crime, inequality, and mobility are urgent issues for communities disadvantaged by processes of colonialism and neoliberal globalisation. These issues are often felt first and most intensely by these communities, yet they are increasingly on agendas across the globe. In such an era, there are urgent educational questions, which are the focus of this working group, about how a curriculum, at any level of education, can become relevant to the needs and concerns of students, especially those local concerns that relate to global challenges. How might mathematics itself be different? How does mathematics intersect with its applications and uses? And, on what basis does it assume authority and legitimacy?

The team organising this Working Group come from the global North and South. We recognise that each participant will be thinking *from* a particular place (Bahn, 2019). Thus, we aim to look *from*, as well as *to*, diverse contexts to consider how the local may be generative in addressing the current global challenges.

We place our work within an emerging strand of literature that relates mathematics education to ecological concerns (e.g., see Boylan & Coles, 2017), where ecology is read as inclusive of



culture, politics, and identity. This ecological turn draws on: critical mathematics education (Skovsmose, 1994); an emancipatory approach to mathematical modelling (Kaiser & Sriraman, 2006); ethnomathematics; post-normal science (Barwell, 2013); and, post-humanism among its influences. There are a range of frameworks (e.g., Kumashiro, 2000, relating to anti-oppressive education) available to categorise and conceptualise orientations towards this work and we offered an overview of these frameworks as a starting point for discussion.

(continued on page 7)

In the Working Group sessions in July 2020, we considered the questions, above, relating to relevant mathematics curriculum. Some responses were/issues raised: Do we want a curriculum that reflects relevant issues, or one that makes things relevant? Is our curriculum preparing the next generation to grasp the scientific and mathematical aspects of climate change? Other subject areas seem to be addressing future issues, does mathematics look at the past? Even modelling looks at modelling the past. Is it helpful to distinguish the relevance of climate change for mathematics, from the relevance of mathematics for climate change?

Another way of saying that might be: Is mathematics education the goal or the means, when discussing a curriculum relevant to students' needs? Education for the environment is intertwined with education to legality and citizenship. There are implications arising from the different educational resources available in different contexts across the world.

We moved on to raising questions, these were some responses: Media has made some issues that are not experienced personally into issues that are personally relevant - how does this carry over into curriculum / mathematics curriculum in relation to climate change? Can we think about curriculum as the problems we want to solve? What kind of mathematics might be taught if the digital is our environment / medium? Use of modelling to connect mathematics with the future? How might we structure the curriculum and learning outcomes in a way that is meaningful to real-life phenomena? Thinking about the mathematics we teach arising from the medium of teaching, rather than the mathematics we *want* to teach. How does a curriculum become 'local'? Can children make it so? A tension between what is relevant to students and what is important for students to learn so that they can tackle what is relevant to them.

We then challenged the group to develop these concerns into researchable questions and the following were offered:

- How do we incorporate contextual and cultural dynamics in our transfer of the curriculum?

- How can the curriculum / mathematics curriculum make issues relevant that have not been felt as personally relevant?
- What might be the roles of integrated curricula (STEM) in enabling tackling questions of local and global relevance?
- What methods might we use to facilitate teacher change?

And, in terms of potential methodologies for addressing such questions, the following were suggested: culture and context are not fixed; how do we look at power, what frameworks are there, e.g., Hannah Arendt? Staying open to what is important to learners. Mathematical task design and design-based research for facing the ecological crisis, paying attention and "listening" to what is really relevant for pupils.

We discussed briefly next steps and there was a consensus about proposing another Working Group for PME 45, in order to share the on-going work of participants in relation to the questions and issues raised. We hope to encourage a network of scholars from around the globe who will collaborate on future research. We hope you will join us at PME 45!

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PME International Committee Reports

Policy Portfolio Group (PPG)

Submitted by Richard Barwell (Canada)

The Policy Portfolio Group (PPG) currently consists of Arindam Bose (India), Anika Dreher (Germany), and Lovisa Sumpter (Sweden) and is led by Richard Barwell (Canada).



The main work for PPG relates to the formulation and recording of PME policy. It is important to keep track of different policy decisions taken by the AGM or the International Committee. With the move to charitable status, decisions will be recorded at three levels:

- the constitution (governed by UK charity law),
- bye-laws (which can be formulated by PME, within the parameters of the constitution), and
- policies and decisions (specific matters decided by the IC, in some cases approved by the AGM, within the parameters of the constitution and bye-laws).

Our main work in 2020 has been to advise the EC and the IC on constitutional matters arising from the effects of the pandemic. In particular, the decision to postpone PME44 to 2021 meant that there was no possibility of holding an in-person AGM. After reviewing the constitution, as well as relevant guidance from the UK Charities Commission (because our constitution is designed to reflect UK charity law), we proposed a virtual AGM. We also proposed that no candidates be elected to the IC, and that outgoing members should be co-opted back to the IC for a maximum of one year. We are now reviewing options for the next steps regarding elections to the IC, as well as for the AGM to be held at PME44, most likely in virtual form again.

We continue to work on other files, including the idea of offering professional workshops as part of the PME program.

Vice President Portfolio Group (VPPG)

Submitted by Einat Heyd-Metzuyanin (Israel)

The Vice President Portfolio Group (VPPG) currently consists of Ceneida Fernández (Spain), Maitree Inprasitha (Thailand), and Maria Mellone (Italy) and is led by Einat Heyd-Metzuyanin (Vice President; Israel).



The VPPG is responsible for issues relating to scientific matters of the PME conference. In 2020, we have been particularly busy with planning the first hybrid PME conference, planned to take place in July 2021. Our portfolio group has been working hard to find solutions to the various questions relating to holding a conference during the COVID-19 pandemic. We discussed these issues already back in June-July 2020, starting with the question of whether to hold a virtual, onsite or hybrid conference. Our recommendation, which was voted on and approved by the IC, was to hold the conference in a hybrid format. We thought this was the

best solution in such times of uncertainty, as it became quite obvious that travel may still be restricted in summer 2021, while the Thailand LOC was ready, eager, and committed to hold the conference on site, even if the number of participants would be limited.

Once this decision on hybridity was voted on, the VPPG met several times to plan on how the hybrid conference would take place. There were multiple issues to resolve, among them: who would lead the hosting of the virtual conference and on what platform, which presentation formats (such as Research Reports, Plenaries, etc.) would be only virtual and which hybrid, who would be able to submit and participate, and more. We came up with recommendations for each of these issues in collaboration with the Thailand LOC and then presented them to the Executive, after which they were voted on in the IC.

(continued on page 9)

One of the main decisions was to delegate the organization of the virtual part of the conference to a special committee, which we named the Virtual Organizing Committee (VOC). The VOC would be in charge of all the technical and organizational matters of hosting the virtual presentations of the conference. In September 2020, we issued a call for members that would be interested in leading this VOC. The IC got several proposals and after some consideration, chose Zehavit Cohen's team, from the Technion, Israel, to lead the VOC. In addition to Zehavit and her team, the VOC includes delegates from the Local Organizing Committee, or LOC (Narumon Changsri and Nisakorn Boonsena), a delegate from the International Program Committee (Ceneida Fernandez) and a delegate from the Executive of the International Committee (Einat Heyd-Metzuyanin). We hope that this formulation will ensure a

smooth coordination of the four parties working on the PME 44 conference: the LOC, VOC, IPC and IC (we certainly have some complexity challenges this year!). Since its establishment in November 2020, the VOC has been meeting regularly every 2-4 weeks and progress has been made with regard to all the issues relating to the conference. The particularities, including the formats of presentations, who can submit and re-submit to the conference etc. have been published in the [1st announcement](#), available on the [PME 44 website](#).

We are very excited about the first hybrid PME conference and hope that, despite the adversities of the COVID19 pandemic, our community will be able to thrive and re-meet, whether face to face (hopefully!) or via the screens that we have all grown too accustomed to.

Secretary Portfolio Group (SPG)

Submitted by Judy Anderson (Australia)

The Secretary Portfolio Group (SPG) currently consists of Man Ching Esther Chan (Australia), Jodie Hunter (New Zealand), and Miguel Ribeiro (Brazil) and is led by Judy Anderson (Secretary; Australia).

Responsibilities: The Secretary Portfolio Group (SPG) is responsible for facilitating communication with PME members, including future conference organisers, for communicating with external organisations such as ICMI, and for keeping records of all PME activities.

As noted last year, much of our time has been spent considering the potential ongoing impact of Covid-19 on international travel and whether we would be able to conduct PME 44 in Thailand in 2021 or whether we should plan for a hybrid conference to allow all members of PME to actively participate in an annual meeting. The notion of a hybrid conference is new to PME but given the success of the Virtual Meeting hosted by Thailand in July 2020 and the lessons learned from the event, we are now planning our first hybrid conference with a newly formed Virtual Organising Committee (VOC) to join the already formed International Program Committee (IPC) and the Local Organising Committee (LOC) in Thailand. Coordinating these committees and facilitating clear and ongoing communication to finalise the program will be challenging but we are all committed to supporting this new venture. The SPG has supported the work of the other PGs in



planning the hybrid conference for 2021 and has communicated changes to the proposed conference in 2021 via newsletters to members.

We are continuing to make improvements to the new website and appreciate the feedback from members. Given the likelihood of ongoing online presentations at conferences, particularly in the

foreseeable future, we are looking at options for providing links on the website to plenary session presentations. These would complement the conference proceedings and would help to promote the diversity of research undertaken by notable PME members.

For future PME annual conferences, we contacted members who had already submitted successful bids and renegotiated where and when they could be held. As members would be aware, such negotiations mean ascertaining whether the conference can be supported by the convenor's university at a different time to that originally proposed, whether venues are available, and whether the local team is able and willing to support the changes to proposed plans. We are grateful that all convenors were adaptable and flexible in the willingness to change the original proposals. There has already been an announcement that PME45 will be held in Spain in 2022. We will make further announcements about future PME conferences at the upcoming conference.

Treasurer Portfolio Group (TPG)

Submitted by Yasmine Abtahi (Norway, Canada)

The Treasurer Portfolio Group (TPG) currently consists of Yiming Cao (China), Anthony Essien (South Africa), Tracy Helliwell (interim; United Kingdom) and is led by Yasmine Abtahi (Treasurer; Canada).



The Treasurer Portfolio Group responsibilities include: managing the financial transactions of IGPME (e.g., making payments and deposits, responding to financial queries, issuing confirmations); maintaining records; advising on fiscal questions from present and future conference organisers; managing the surplus fund for Regional Conferences and Special Projects and preparing annual financial reports. IGPME's banking is with Barclays Bank UK, requiring at least one member of the IC (i.e., an officer of the organisation) to be from the UK.

The accounts for PME 43 and all Special Projects for 2019 are audited and approved. We are thankful to Cris Edmonds-Wathen for acting at the auditor.

PME 2021 will be a hybrid conference – with a face-to-face part held in Thailand and a virtual component organised by the

Technion, Israel Institute of Technology. From Sept 2020, the TPG has been actively involved in analysing the budget for the upcoming conference assessing risks in multiple scenarios. Details on the final decisions were approved by the executive members and the IC members; all these can be found in the first conference announcement.

As part of the Charity Organisation mandates, the PME IC has to include a member from the UK, at all times. Laurinda Brown (from the UK) retired from the IC and the IC accepted Tracy Helliwell to join the TPG, on an interim base, until the next General Meeting election. Welcome Tracy :)

Prior to the final approval to become a Charity Organisation, TPG has undertaken a process to make sure that our accounts, financial reports, and methods of storing and presenting financial information are in accord with the requirements of the mandates within the charity organisation rules and regulations. We will update you on these developments in the next newsletter. Stay tuned :)

Credits for Laurinda Brown

Submitted by Markku Hannula (Finland)

Laurinda Brown was elected to the PME International Committee in Singapore, 2017. She did important work for PME as the treasurer and as the UK representative handling our application to become a Charitable Incorporated Organization under UK law. Last year she decided to retire, because of health issues forcing her to reduce her work load.

PME is grateful for Laurinda's input to the less glorious, yet important work with administration and finances. This kind of work is usually not visible to the members, as long as it is diligently handled.

For me, Laurinda has been the embodiment of the welcoming spirit of PME to newcomers, as she was the person welcoming me

to interesting discussions at my first PME, in Lahti 1997. Since then, I am an enactivist. Me and Laurinda share plenty of nice memories from past PME conferences: head banging together at conference dinner dance floor, shopping for hawaiian shirts, and admiring the beauty of Singaporean gardens.

As the PME president, I want to thank you for your services to the organization. As a friend, I send you hugs and hope to see you again at the next conference.



Open Contributions

A Survey to Compare Teaching and Learning Practices about MLD in Different Countries

Submitted by Marie-Line Gardes (Switzerland)

Our research team - called RITEAM (see riteam.ch) - proposes to structure and to develop mathematics education studies on MLD (Mathematical Learning Disabilities) in order to improve the identification of MLD and the characterisation of interventions in an educational context.

We adopt the perspective of mathematics education which considers that the acronym MLD implies specific difficulties in mathematics or persistent difficulties in mathematics or both specific difficulties in mathematics and persistent difficulties in mathematics.

In a first study, we conducted exploratory research on MLD in Mathematics Education over the past ten years (Deruaz et al., 2020). This work revealed that research into MLD in the context of Mathematics Education has expanded since 2013, in particular in the US; most studies addressed arithmetical content at the primary school level and the research focused on educational interventions. However, we noted that research in the field of mathematics education has failed to sufficiently explore both the characteristics and the detection of students with MLD.

Thus, new research questions emerge which involve several actors (researchers, teachers' trainers, teachers, medical and paramedical professionals, students, etc.):

- How can we design devices and tools that can detect students with MLD at an early stage in the classroom?
- How can we design learning environments that foster learning and enhance the potential of such students in an inclusive perspective?
- How can we improve teacher training, both in ordinary and special education contexts, through an improvement or the development of remedial interventions, support devices, and scaffolding?

That implies in particular a better knowledge of teaching and learning practices as far as MLD are concerned in different countries. In order to investigate this and following the discussions that occurred in the Working Groups of PME 42 and 43 (Ouvrier-Buffer et al., 2018; Gardes et al., 2019), we elaborated a survey.

This survey is addressed to researchers and teachers' trainers and concerns primary school, secondary school, and special education. It is composed of three sections: teacher training, resources available for teachers, links between medical or paramedical practitioners and teachers in student monitoring.

We kindly ask your help to make our survey as complete as possible and we invite you to fill out the questionnaire available here:

<https://form.jotformeu.com/93374221927359>

Please forward this link to your networks as well (the questionnaire is available in several languages).

The results of the survey will be analysed and presented in the Working Group at a next PME.

Thank you for your collaboration,

RITEAM

DERUAZ Michel, DIAS Thierry, GARDES Marie-Line, GREGORIO Francesca, OUVRIER- BUFFET Cécile, PETEERS Florence, ROBOTTI Elisabetta

References

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- Gardes, M.-L., Gregorio, F., Deruaz, M., Dias, T. (2019). Working Group 2 Report : Mathematical Learning Disabilities a Challenge for Mathematics Education. *PME Newsletter* (Issue December 2019, p.6). Retrieved from: https://issuu.com/pmeadministrativemanager/docs/191216_pme_newsletter_template_web
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PME Announcement Forum on the PME Website

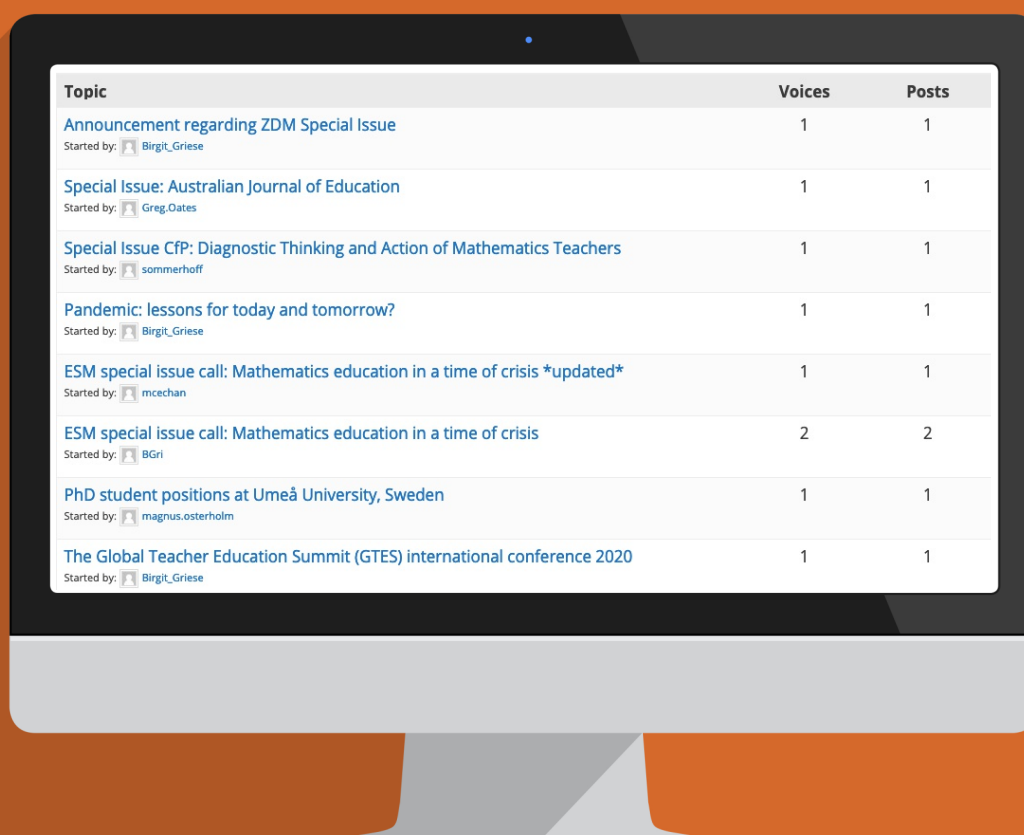
The PME website (www.igpme.org) is the main portal for all communication and information regarding PME. A useful feature for PME members is the Announcement Forum as this is the place to post items of information for PME members such as job announcements, conference announcements, and so on. To access the Announcement Forum, please visit









<http://members.igpme.org/>

and use your PME member login. You can then find the forum in the main menu. By clicking on 'subscribe' in the forum, you then receive an email each time an announcement is posted in the forum.

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

1. Announcement regarding ZDM Special Issue
2. Special Issue: Australian Journal of Education



Topic	Voices	Posts
Announcement regarding ZDM Special Issue Started by:  Birgit_Griese	1	1
Special Issue: Australian Journal of Education Started by:  Greg.Oates	1	1
Special Issue Cfp: Diagnostic Thinking and Action of Mathematics Teachers Started by:  sommerhoff	1	1
Pandemic: lessons for today and tomorrow? Started by:  Birgit_Griese	1	1
ESM special issue call: Mathematics education in a time of crisis *updated* Started by:  mcechan	1	1
ESM special issue call: Mathematics education in a time of crisis Started by:  BGri	2	2
PhD student positions at Umeå University, Sweden Started by:  magnus.osterholm	1	1
The Global Teacher Education Summit (GTES) international conference 2020 Started by:  Birgit_Griese	1	1