



NEWSLETTER

International Group for the Psychology
of Mathematics Education

July 2020

In this issue

PME Virtual Meeting 3

PME 44 5

PME AGM 6

IC Reports 7

PME Special Project Report 9

Open Contributions 11

PME Forum 14

Message from PME President

Dear Friends at PME,

The year 2020 has turned out to be exceptional. The pandemic of COVID-19 has changed the daily lives of most of us. Yet, some have been hit harder than others, and the pandemic is still growing in many countries. The full impact of the disease is still to be seen, and the only certain thing is the uncertainty.

I had the pleasure to visit Khon Kaen, Thailand, in January 2020, in preparation for PME 44. The Local organizers were working hard on the conference and I was really looking forward to July 2020 in anticipation of a lovely PME conference. As I was travelling back home, news from COVID-19 epidemic started to make headlines. As the disease became a pandemic and once ICME conference was postponed to 2021, it was clear that PME should also postpone our conference. The new date for PME 44 conference is July 20 to 24, 2021, and it will be organized in Thailand as planned.

This is the first time in PME history that we are not organizing our yearly conference. That influences our organization in many ways.

(continued on page 2)



Message from the Editors

During the past months, „social distancing“ has become a prominent phrase all over the world, likely showing a more rapid, exponential growth than COVID-19. However, as members of PME and other social communities, we see the phrase as not entirely correct, as staying connected and supporting each other is important in times of crisis! The credo that we propose is:

“physical distancing, social closeness”

(continued on page 2)

Message from the PME President (continued)

The yearly conference is the main scientific activity of PME. Our income and expenses are related to conference participation. Our main decision body, the Annual General Meeting, is tied to the conference. Because we are not organizing the conference, the PME Board of Trustees (also known as International Committee, IC) has had to reconsider many of the established practices.

We have done our best to compensate the postponed conference of 2020. Because publishing Research Reports (RR) in PME proceedings is important to many of our members, we completed their review process, will publish the accepted RR in interim proceedings this year, and will include them in the proceedings of the PME 44 conference next year. Authors of accepted research reports will have the opportunity to present their work next year. To offer the PME community an opportunity for scientific communication, the PME 44 organisers are hosting a small-scale virtual meeting in July 21–22, 2020. There are separate messages about the PME 2020 Virtual Meeting and the AGM in this newsletter.

Some other time in PME history, the cancellation of a conference might have been a financial catastrophe. Fortunately, our finances are currently sufficiently strong to survive through this. We have been even able to refund our members' pre-registration expenses. We decided that pre-registered participants may have their conference payment refunded or they may roll it over to the next

year. We are not returning membership fees, but we decided that the membership fee for 2020 will cover also for the year 2021.

Our treasurer, Laurinda Brown, has decided to step down from her position as PME treasurer and to resign from the International Committee due to health reasons (not related to COVID-19!). The board of trustees has elected Yasmine Abtahi as the new treasurer. Yasmine has served in the treasurer portfolio group since her election to the board last year. Laurinda is now helping Yasmine to take over as the new treasurer.

The submission of PME application to become a charitable organization under UK law has been postponed because Laurinda is retiring from the IC. In line with the PME constitution, the IC (board) will act promptly to appoint a new UK member to the board to replace Laurinda for one year. Tracy Helliwell (University of Bristol) has indicated that she is willing to accept such an appointment.

I am eagerly waiting for the virtual meeting with an anticipation of an interesting event. See you soon.



Markku Hannula
President of the IGPME

Message from the Editors (continued)

With this issue of the newsletter, we want to act on this credo, help the PME community to connect, and help everyone to stay up-to-date in this demanding time.

The newsletter contains multiple reports, giving insights on what is happening within PME (before and during COVID-19). In particular, information about the oncoming PME 2020 Virtual meeting as well as plans for the postponed PME 44 conference are presented. This is supplemented by an open contribution from our past president Peter Liljedahl who adds some personal "insights from the inside".

Markku Hannula and Richard Barwell also provide insights on how PME is handling the AGM and elections, which can't be conducted as usual during the conference.

In contrast to these contributions focusing on rather exceptional topics, the newsletter also includes regular contents, for example the reports from the PME portfolio groups as well as a report from a PME special project, focusing on a professional development project for university teachers.

Speaking about teachers, the newsletter also contains an open contribution from Iben Christiansen & Kicki Skog, sharing some insights into teachers' work during COVID-19.

Concluding, we want to thank all PME members that contributed to this issue. Although many submissions for this newsletter have been delayed due to the members' current personal, work-related, or official duties, many authors were eager to contribute and used their little free time to write for the newsletter in order to support "social closeness" within PME.

Take Care

Maike Vollstedt, Igor Kontorovich & Daniel Sommerhoff

The 2020 Virtual Meeting

of the International Group for the Psychology of Mathematics Education

Submitted by Maitree Inprasitha (PME 2020 Virtual Meeting Chair; Thailand) and Markku Hannula (President of the IGPME; Finland)

While PME 44 has been postponed to 2021, PME wants to offer its members an opportunity for discussions, and to stay in touch with each other. For this purpose, the PME 44 organisers will host a Virtual Meeting via Zoom at the time of the originally planned conference (July 21–22, 2020).

The meeting will consist of pre-recorded presentations and live online discussions. We will publish video presentations before the conference so that people living in different time zones can all watch them at the time that is most convenient for them. The live discussions will take place between 6 p.m. and 9 p.m. Thailand time (11 a.m. to 2 p.m. UTC), which seemed like a time window that would best serve our members around the world.

We are still exploring, if we can safely open the event for anyone to join. At least all PME members and recent PME members will have access to the virtual meeting.

The program of the virtual meeting will have a Plenary, four Research Report (RR) presentations, two Working Groups (WG), and the PME Annual General Meeting.



Our invited plenary speaker is Professor Marcelo Borba from the State University of São Paulo, Brazil. He will talk about the very timely issue of distant learning using technology. His title is ***"Future of mathematics education post-covid-19: Digital technology, critical education and epistemology"***.



All other presentations are volunteers among those who submitted their research proposal to PME 44. We sent an invitation to all authors of the RR papers accepted to PME 44 to present their paper in the virtual meeting. As only four volunteers responded positively, we accepted them all. For WG, we invited modified proposals for the virtual meeting from those who had submitted a WG proposal for PME 44. The PME 44 International Program Committee accepted the two submitted WG proposals.

The program of the meeting is but a bleak shadow of the richness of PME conferences. Yet, we feel very excited about this new type of PME activity and hope to see many of you online!

Please find more information about the 2020 Virtual Meeting of IGPME in the link;

<https://pme44.kku.ac.th/home/2020virtualmeeting/>

2020 Virtual Meeting Program

The 2020 Virtual Meeting of IGPME Program (July 21-22, 2020)

Egypt

Germany

Italy

Sweden

Belgium

Switzerland

South Africa

Netherlands

Spain

Israel

Finland

Australia

Japan

Thailand

Indonesia

Chile

Canada

USA

Mexico

UTC+7	UTC+9	UTC+10	UTC+3	UTC+2	UTC+1	UTC-3	UTC-4	UTC-5	21 July	22 July
18.00	20.00	21.00	14.00	13.00	12.00	8.00	7.00	6.00	Opening	RR Rott, Benjamin & Leuders, Timo
18.10	20.10	21.10	14.10	13.10	12.10	8.10	7.10	6.10		
18.20	20.20	21.20	14.20	13.20	12.20	8.20	7.20	6.20	Plenary Borba, Marcelo	WG (parallel) Shvarts, Anna, et al. Coles, Alf, et al.
18.30	20.30	21.30	14.30	13.30	12.30	8.30	7.30	6.30		
18.40	20.40	21.40	14.40	13.40	12.40	8.40	7.40	6.40		
18.50	20.50	21.50	14.50	13.50	12.50	8.50	7.50	6.50	RR Pearn, Catherine, et al.	break
19.00	21.00	22.00	15.00	14.00	13.00	9.00	8.00	7.00		
19.10	21.10	22.10	15.10	14.10	13.10	9.10	8.10	7.10	break	
19.20	21.20	22.20	15.20	14.20	13.20	9.20	8.20	7.20		
19.30	21.30	22.30	15.30	14.30	13.30	9.30	8.30	7.30	WG (parallel) Shvarts, Anna, et al. Coles, Alf, et al.	AGM
19.40	21.40	22.40	15.40	14.40	13.40	9.40	8.40	7.40		
19.50	21.50	22.50	15.50	14.50	13.50	9.50	8.50	7.50		
20.00	22.00	23.00	16.00	15.00	14.00	10.00	9.00	8.00		
20.10	22.10	23.10	16.10	15.10	14.10	10.10	9.10	8.10	RR Sommerhoff, Daniel, et al.	
20.20	22.20	23.20	16.20	15.20	14.20	10.20	9.20	8.20		
20.30	22.30	23.30	16.30	15.30	14.30	10.30	9.30	8.30	RR Winkel, Kirsten, et al.	
20.40	22.40	23.40	16.40	15.40	14.40	10.40	9.40	8.40		

PME 44

Update on the PME Conference

**Submitted by Maitree Inprasitha
(PME 44 Conference Chair; Thailand)**

The Local Organizing Committee of the 44th Annual Meeting of the International Group for the Psychology of Mathematics Education is pleased to invite you to attend the **virtual PME 44 conference** to be held, from 21-22 July 2020.

Due to the global pandemic caused by COVID-19 and the present situation of its rapidly outbreak across the world, it is our regret that PME 44 has been inevitably postponed by one year. Thailand as the host country is also affected by this pandemic.



Photo: TrueID Lifestyle <https://travel.trueid.net/detail/97yALyA6Pd7>

In order to follow the Disease Control Measures, we accept the postponing and sincerely apologize to everyone for the consequences of this unfortunate development. However, we would like to express our gratitude for all support from the IGPME and the opportunity to persist in hosting the conference in 2021, and the virtual conference in 2020. We have been continuously working with the committee to make both events successful.

Many activities have been undertaken in the preparation for the conference: the first IPC meeting and an extra online meeting of the COVID-19 monitoring team to assess the situation in response to new developments. We also hosted the virtual second IPC



meeting, which aimed to complete the review process of Research Reports. This work is especially significant as feedback from reviewers could be helpful for many PME members. Regarding the accepted RR papers, which will be published in the online interim proceedings by this year, we are planning to do the editing and keep working under the timeline.

This year's virtual conference is the most challenging part since PME conferences had never been held online before. The program has been designed to support participants from various time zones, and it will be arranged technically in such a way that people can participate smoothly and experience the theme of the conference. For those waiting to explore the flavor of Thailand through social program, please follow the updates until next year.



PME Annual General Meeting (AGM)

Submitted by Markku Hannula (President of the IGPME; Finland) and Richard Barwell (Policy Portfolio Chair; Canada)

The PME Annual General Meeting (AGM) has always taken place at the annual conference since members of PME are conveniently gathered together in one place. At the AGM, members vote on changes to PME policy, approve the financial statement, and elect new members of the International Committee (IC) (trustees).

Given the postponement of PME 44, it will not be possible for us to hold an AGM in a physical location. Many of the functions of the AGM are important and in some cases are required by our constitution. Finding a solution has required a careful reading of the PME constitution (as approved in 2019), which was not written with a global pandemic in mind.

Virtual AGM

Our constitution states that an AGM must take place once per year in a physical location. We are not able to meet both of these requirements (i.e. hold the AGM this year AND be in a physical location). Our constitution is modeled on British charitable status guidelines. The UK Charity Commission has issued advice about the pandemic to charitable organisations. In particular:

In the current situation, it is becoming increasingly difficult to hold face-to-face meetings. Some charities have clauses in their governing documents that allow them to meet virtually or to use telephone facilities, so we advise trustees to check their governing document and see if they can make amendments themselves to facilitate changes as to how or when meetings are held.

Where there is no such clause in your governing document and you decide to hold meetings over the phone or using digital solutions, we will understand but you should record this decision and that you have done this to demonstrate good governance of your charity.

The IC judges that it is more important that it is accountable to its members, than to wait until an AGM can be held in a physical location. In the light of the Charity Commission advice, we therefore propose to hold an AGM by videoconference in July 2020 (most likely using Zoom). The first item of business will be to approve a motion permitting this divergence from our



constitution. If the motion is approved, a slimmed-down agenda will be proposed, including reports from the IC portfolios and presentation of the financial situation.

Postponement of elections

In the current circumstances, the IC does not feel confident that it can facilitate a well-managed and fair election of new members of the IC (trustees) in a virtual meeting. In PME, the conference time has been used to encourage people to run for the IC, and members have had time to learn about the aspiring IC members. We fear that this cannot be achieved without the conference. More importantly, we are not sure that we would be able to hold the electronic voting securely and fairly.

The PME constitution dictates that four members with the longest term of office must retire each year. If the AGM doesn't elect new members, the IC (board of trustees) may appoint members until the following AGM. This is therefore the solution we propose: that no election be held this year, following which the IC (board of trustees) will reappoint the outgoing members for one additional year. Moreover, Laurinda Brown will also be retiring early from the board. As we need at least one UK member on the board, the board will act promptly to appoint a new UK member to the board to replace Laurinda for one year. Tracy Helliwell (University of Bristol) has indicated that she is willing to accept such an appointment.

The IC supports this decision, since much of the work of PME has been suspended until next year. In effect, the usual one-year cycle has been extended over a two-year period. This decision reflects that reality, while respecting the provisions of our constitutions.

In conclusion, while we do not plan to organize an election this year, we welcome comments and feedback from members.

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.

In relation to the COVID-19 pandemic, some policy issues have arisen in relation to the postponement of the PME 44 conference and are currently being reviewed.

The following ongoing files are currently being worked on by the PPG:

- Completing updates to our record-keeping processes
- Development of research and publication ethics policy
- Examination of concerns relating to the pre-registration fee
- Consideration of the idea of including professional workshops at PME conferences.



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. Due to the COVID-19 pandemic, most of the ongoing work of the VPPG has halted. Instead, we have been busy during the last three months in assessing the situation, thinking and deciding about the postponement of PME 44 and all its implications. As part of this process, the President (Markku) and VP (Einat) formed a special group together with Maitree (member of the VPPG and Chair of PME 44) and Anthony Essien (delegate of the Treasurer Portfolio) that met a few times and prepared plans of action to be discussed at the Executive and IC level. I am happy to report that the timely fashion by which these meetings were held led to an orderly decision process that enabled Markku and Maitree to issue announcements to the membership immediately after critical decisions were made by agents external to the IGPME (such as ICME14).

Earlier this year, the VPPG worked together with the sub-committee for supporting researchers from under-represented countries at the PME, headed by Talli Nachlieli (Israel) to draft a proposal to the IC titled "PME Accessibility Outreach Proposal". This work has been initiated by calls from the membership to expand the accessibility of PME to under-represented communities. The main part of this proposal included a plan for a specialized workshop, to be held during PME 44, where senior and experienced PME researchers will guide newcomers in writing and revising Research Reports for the PME. The workshop organizers were planned to reach out, in collaboration with the IPC, to researchers from under-represented countries whose proposals for RRs have been rejected but still plan to attend the conference (with Oral Communications or Poster Presentations). In addition, the workshop was planned to be open to other early-career researchers on a first-come first-serve basis. The proposal was approved by the IC and its specific planning is expected to be renewed towards next year.

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 (Australia). Due to work-related responsibilities, Judy did not resume her role as Secretary until January 2020. The SPG would like to thank Einat Heyd-Metzuyanim (Israel) for leading and supporting our work during that time.



Under the leadership of Einat Heyd-Metzuyanim, the IGPME website was transferred to a new site

<http://igpme.org>

which is now fully functional and provides a detailed history of our work with past proceedings, and a members site with information about policies and AGM meetings. We are keen to have feedback from members on the site and suggestions for further development.

Much of our time this year has been spent considering whether PME 44 should go ahead in Thailand in 2020 given the international impact of COVID-19. You would have received information from the President that it will now be held in Thailand in 2021. We now need to contact members who have submitted successful bids to hold future PME conferences to renegotiate where each of the future conferences will be held.

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.

Treasurer Portfolio Group (TPG)

Submitted by Yasmine Abtahi (Norway, Canada)

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



Unfortunately, Laurinda Brown, our Treasurer, had to resign from the International Committee. She and her wisdom will certainly be missed. Yasmine Abtahi, from the TPG, was elected by the International Committee to replace Laurinda Brown.

A few words about Yasmine: I have joined the PME International Committee in 2019. To my position as a treasurer and a member of the International Committee, I bring my years of experiences as a member of IC in Mathematics Education and Society conference as well as my focus on the finance sub-committee of the MES IC.

During the turn over time, I received a set of extremely organised

and self-explanatory documents from Laurinda. I am grateful for her keen eyes and her systematic way of organising the financial documents. Her structure made the transition between the two treasurers very smooth. Thank you Laurinda :)

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 at the final stages of the internal audit, soon to be sent to an external auditor. Peter Gates who has been willing to act as auditor for a regional conference would not be available to audit 2019 accounts. The treasurer is in contact with other PME members who have expertise to invite a member to act as auditor.

TPG will provide a detailed report of the 2019 PME finances in the virtual AGM.

PME Special Project Report

Professional Development of University Teachers

Submitted by Igor' Kontorovich (New Zealand) and Ian Jones (United Kingdom)

Our small project concerned professional development of mathematics teachers in colleges and universities. Overall, the project consisted of the design and delivery of two workshops. One workshop took place on 16 August 2019 at Loughborough University (UK), and was attended by 22 participants from 13 universities. This workshop was also supported by a Collaborative Award in Teaching Excellence (CATE) awarded by the Higher Education Academy (UK) to Loughborough University, the University of Edinburgh, and the Open University. Another workshop was offered on 5 December 2019 at Massey University (New Zealand) and was a part of an educational day of the annual New Zealand Mathematics Colloquium, which annually brings together mathematicians all across New Zealand. Seventeen participants attended this workshop.

The workshops were targeted at advancing participants' knowledge of students' mathematical thinking in core topics in Calculus and Linear Algebra. We used students' common responses to typical problems in first-year mathematics courses to trigger workshop discussions. The lion's share of the workshops consisted of group work, where participants engaged with students' responses to problems, discussed possible ways of thinking that could underlie



these responses, and shared their classroom experiences and pedagogies. To support discussions, we engaged the participants with Fischbein's (1989) theory of tacit models and recent empirical studies in tertiary mathematics education. Metaphorically speaking, we leveraged mathematics education research as a repository of various lenses that mathematics educators can use to reflect on their practice.



Through these lenses, many teaching-and-learning issues encountered on a daily basis can turn from stand-alone to part of a pattern, from arbitrary to reasonable, and from idiosyncratic to global. Indeed, while the same student responses were used in the UK and New Zealand, participants in both countries related to them easily and shared stories of a similar flavor from their practice. The last part of the workshop focused on STACK – an advanced computer-aided assessment system – and its potential to support students' learning.

The participants' feedback provided insights on what they "took out" of the workshops. One of the raised themes indicated that the group discussions motivated the teachers to consider "what the

student is thinking when making a common mistake", delve into possible sources that can cause confusion, and recognise mathematical topics in which "preconceptions can lead to errors". We were especially pleased to see that at least some of the participants valued thinking about students' mathematical thinking not just in the case of mistakes. In the words of one participant, "Don't focus on misinterpretations (and other negatives). Instead focus on what that students think". Another theme that was raised pertained to the pedagogical value that the participants ascribed to providing students with immediate feedback on their responses. Some participants acknowledged their lack of resources to systematise students' responses quickly and reliably, especially in the case of large classes. This acknowledgment linked to another feedback theme – the potential of computer-aided systems to support the work of a teacher.

The participants' suggestions on how the workshops that they experienced can be improved were also insightful. For instance, we asked the participants to work in the same groups throughout the workshops hoping that this structure will support their

communication on a deeper level. However, a few participants indicated that they would prefer switching groups to get "the change to work with different people". Another set of suggestions communicated the teachers' interest not just to talk about STACK but to be hands-on, for instance, through designing questions and feedback to students' responses.

We would like to use this opportunity to thank the IGPME and IC for supporting this project. Working on it provided us with valuable professional experiences, opportunities to engage new people with issues in mathematics teaching and learning, and a space to offer practitioners even just a nibble of what mathematics education research has to offer. We are building on the materials and insights from this project to design new professional-development workshops for university-level mathematics teachers. In fact, another workshop of this type, funded by CATE and led by George Kinnear at the University of Edinburgh was to be held this April 2020, but has been postponed due to the global pandemic. We hope to be able to resume our professional development activity soon.



Open Contributions

Insights from the Inside

Submitted by Peter Liljedahl
(Past President of IGPME; Canada)

On March 26th we learned that, due to the global COVID-19 pandemic, PME 44 (scheduled to be held July 21-25, 2020 in Khon Kaen, Thailand) was being postponed until 2021. This was the obvious decision for the PME International Committee (IC), the PME International Program Committee (IPC), and the Local Organizing Committee (LOC) to make. As the president of PME (2016-2019) when the bid for Khon Kaen to host PME 44 was presented and awarded, I thought I would offer some insights into why this seemingly obvious decision, was likely not an easy one to make.

At PME 41 (2017), in Singapore, the IC was presented with a bid by Maitree Inprasitha and a team of over 30 conference delegates from Thailand. In twenty short minutes they not only showcased the amazing conference venues that awaited us in Khon Kaen but also enthusiastically reminded us of the numerous, ubiquitous, and continuous participation of Thai mathematics education researchers at PME over the decades. This presentation, coupled with the subsequent budget, made the decision to award PME 44 to Khon Kaen an obvious one for the IC.

In the years that followed, Maitree and his LOC presented updates about the conference planning, the logo, the budget, the conference theme, and recommended plenary speakers and panelists. At PME 42 (2018), Maitree was elected onto the IC and his duties expanded from hosting PME 44 to partaking in the scientific and administrative oversight of all of IGPME. In 2018 he was named to the IPC for PME 43 and travelled to Pretoria in April of 2019 to participate in making final decision about the PME 43 scientific program as well as to be mentored in the structural aspects of hosting PME 44 (ConfTool, scheduling, reviewing, etc.). At PME 43 Maitree, along with his co-chair Narumon Changsri and several members of the LOC, made their final presentation to the IC as well as worked diligently throughout the whole conference to glean as much information as possible from the LOC.

Since PME 43, Maitree, Narumon, and the entire LOC have been working hard to prepare the first announcement, launch the PME 44 website, make a call for reviewers, prepare ConfTool to accept



pre-registration and RR submissions, and solicit, receive, and organize reviews. In short, the PME 44 LOC has been working tirelessly for the last three years to host us in July 2020. Joining them in this endeavour for the last 8 months has been the IPC, led by Markku Hannula in his first year as PME president.

Given the hard work that has already gone into hosting PME 44 in Khon Kaen in 2020, the decision to postpone the conference, while maintaining the same venue and LOC is the right one to make. But, this was not without it's own challenges. While the PME 44 LOC has been toiling away, so too has the PME 45 LOC. That bid, presented by Ceneida Fernandez at PME 42 (2018), was meant to bring PME to Alicante, Spain in July 2021. Ceneida and her LOC have been working on this endeavour for two years and their efforts have also had to be delayed. As has the work of the LOC's for PME 46 and 47.

Although COVID-19 has made it inevitable that PME 44 be postponed, and along with it PME 45, 46, and 47, I don't want us to forget that this seemingly obvious decision does not come without consequence. Hundreds of people have worked for tens of thousands of hours to bring these conferences to us on time, on budget, and to deliver stimulating scientific and engaging social programming. The PME IC and PME 44 IPC undoubtedly agonized for many months as they watched COVID-19 ravage the world as it deviously crafted a reality in which an in-person conference was becoming more and more unlikely. As the past president, I can easily envision how difficult the first three months of 2020 must have been for Markku and the whole IC and I want to take this opportunity to thank them, as well as the LOC's for PME 44-47, for making the incredibly important and difficult decision to postpone PME 44.

The Terrific Teachers and the Calamitous COVID-19

Submitted by Iben Christiansen
(Sweden) and Kicki Skog (Sweden)

"It is an exciting yet stressful and challenging time" (teacher)



This time, it is not Trump but the approach to the COVID-19 pandemic that has put Sweden in the headlines. Children up to Grade 9 must still attend school unless they are in a risk group. Upper secondary schools use distance teaching instead – an approach considered feasible almost everywhere in the country due to the high penetration of internet connectivity. We asked some mathematics teachers how it was to work under these conditions, and here we share some of their insights.

While it has been challenging, and "everything must be prepared and in place before the lesson starts", it has also lead to teachers trying "new ways of working" that will give rise to "testing and retesting ideas [they] have about learning and teaching".

One of the challenges for these teachers is that learners are not always present or actively participating in the online classes. It may therefore be necessary to have prepared a "plan B" for these learners. The teachers also find that the lack of direct contact with the learners influences their work, leading to learners asking fewer questions, and making it harder to carry out formative assessment and follow up in relation to the learning of individuals. As teachers also get ill, and with fewer children attending school, the daily structure, particularly in the schools that are still open, is adjusted to the situation of the day. This means that teachers may suddenly be teaching a group of learners with whom they are not familiar. For some teachers, this creates extra challenges in relation to the online activities, as learners may not be used to working in the same way with the technology.

Social inequities also manifest themselves strongly in these new circumstances. High school learners, who do not have a personal computer or their own room, are not managing to study from home. One teacher describes it thus:

In the newspapers, you can read that many learners who normally have problems with school are favored by distance education, but that is not something I experience. Amongst my learners exactly zero of them seem to perform better in any way, or to develop more effectively from working from home.



There are some learners who appear to manage the same level as when they are in school; some for whom it is worse; and some for whom it is a total catastrophe. I can hear, when I talk to them through [platform], that several of them have to look after younger siblings or sit in messy environments. Many also say that their internet runs out, so it is hard for them to take part in the video conversations and work with the digital study material. An own room with fibre connection and food to eat at lunchtime is not everyone's privilege.

This has forced her into making more pragmatic choices concerning her teaching. She explains how she normally works with cumulative tests, to avoid "compartmentalising" the content. This also facilitates coherence in her assessment, and she feels that it has led to better learner performance on the national test. However, to make areas in need of development clearer for her (struggling) learners, she has felt compelled to split the content into smaller components, and issue checklists for the learners so they can self-assess.

The teachers of grades 7-9 in our sample have different challenges. They have to balance having learners in the classroom with having learners in risk groups participating online. They also have to adjust to the day-to-day organisation of the school, which means teachers are not always teaching their main subjects. For one of our respondents this was doing his learners a disservice and he insisted that the arrangement be changed:

I have managed to [get school management to agree] that the learners work with mathematics when I am in the classroom, as the other teachers have a hard time helping the learners with their math tasks.

What has been the most challenging is not to get to meet up with "my" eighth graders, and I complained to the school management about this several times, so last week I [got them to agree] that I will meet every class in Grade 8 one lesson a week, so I can follow up and help them with mathematics in situ. It was wonderful that I managed to get [management] to agree to that.

However, the changed organisation of classes has still meant that this teacher alters the way he teaches. Something which has inspired him to rethink his teaching under normal circumstances:

I don't do any lectures; instead, we review the mathematics we have already worked through earlier in the year. This has proven very effective for the mathematics development of the learners. Some learners who were behind have caught up, at the same time as I have found opportunities for learners who need more depth or more challenging tasks. So [this approach] I will take with me after the crisis. I will plan two to three weeks in the middle of the semesters where the learners can catch up or work in depth with mathematics. Actually, it is obvious when I look at it from this perspective, but previously it has felt as if we constantly needed to move forward, forward, forward in order to develop their mathematical knowledge. But to stop and reflect about what we have learned and what we need to work more with is at least as important. So, a lesson I take with me is to force myself to stop and take it easy regularly.

One thing that worried some of our respondents was the fairness around examination and marking. They felt they did not have the same basis for giving marks, particularly since national tests were cancelled, and that it was harder/impossible to make the exams fair and legal.

We would have expected the teachers to find using the various technologies for distance education a challenge, but that did not dominate their responses. Some said that they were already using the technology previously, and that it has been easier for them than for some of their colleagues. They also mentioned that they felt the threshold to using the new ICT tools was low because they found the technology interesting or because they had already learned similar tools previously.

The teachers differed with respect to how much they felt their teacher education had prepared them for online teaching. In the opinion of one teacher, testing digital educational tools during her teacher education had lowered her threshold to using other digital tools. Further, she felt that, because she had recently completed her teacher education, she had an advantage over colleagues who had graduated previously. However, another of the respondents felt that they had not engaged ICT sufficiently, and a third pointed out that they had learned nothing about distance education at all during teacher education.

The helpful aspects from their teacher education most frequently mentioned by the teachers were about creating tasks, including using these in formative assessment, feedback, and other forms of formative assessment such as online tools to do quick checks or exit tickets. One teacher also connected this to learner motivation:

The thing from my teacher education that I have pondered especially much during this time is how to motivate the learners to work with the tasks despite me not being there. First and

foremost, the learners whom I seldom meet. I have concluded that continuous and forward-directed feedback must be the most effective method I learned in my teacher education. Therefore, I have invested extra in that. I mean, in terms of written feedback on digitally submitted tasks and homework, as well as clarity around what I expect my learners to work with and hand in to me.

One of the teachers was concerned about the hidden curriculum conveyed in some of the structural changes at his school. He felt that the most important task during the COVID-19 crisis was to make sure the learners had schooldays as close to normal as possible, and that teachers worked from an understanding that the learners may carry worries and concerns that manifest in different ways. But his experience from some work teams did not fit these priorities. His example was that while the rearrangement of the physical spaces from group tables to individual tables was justified by social distancing, it reflected a hidden agenda of creating more silent and disciplined classrooms. He also expressed concerns about devaluation of the teachers' specialised expertise.

Interestingly, only this teacher mentioned using statistics around the COVID-19 crisis in his teaching.

Reading over the testimonies of our participants makes us proud of our teachers. They recognise the challenges, most of them seem to focus on creating the best possible learning opportunities under the circumstances, and first and foremost, on caring for and supporting their learners. They take on the learning of new technologies through simply trying out something and practicing it. They adjust their teaching to suit the new situations. They draw on what they have learned during their teacher education. And they take lessons from the current circumstances to be used in the classroom once the situation returns to normal.

The debate about the appropriateness of the COVID-19 strategy of the National Public Health Authority rages on, but from our corner of the duck pond, it seems our teachers have risen to the occasion. Their task is conceivably not as daunting as that confronting medical staff worldwide on a daily basis, but certainly these teachers are playing an indispensable role in carrying our children forward to the days that lie beyond the pandemic.

About the Authors

Iben Christiansen & Kicki Skog, Department of Mathematics and Science Education, Stockholm University, are working in [the TRACE project](#) on tracing mathematics teacher education in the practice and learning of newly graduated teachers. They contacted the teachers participating in the project in order to find out how they were adjusting to their new circumstances and whether they needed support. The participants have approved the use of their responses in this newsletter post. Iben has translated and adapted the responses.

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. Special Issue CfP: Diagnostic Thinking and Action of Mathematics Teachers
2. Pandemic: lessons for today and tomorrow?
3. ESM special issue call: Mathematics education in a time of crisis
4. PhD student positions at Umeå University, Sweden
5. The Global Teacher Education Summit (GTES) international conference 2020
6. Research Fellow in Mathematics Education
7. MOST Research Assistantship, Western Michigan University, USA

