

Calculus Learning and Teaching Around the World: The Future

Your suggestions for future events following your participation in the event hosted by Pat Thompson and Guershon Harel on 9-10 June 2021 to celebrate a ZDM Special Issue!

IRENE BIZA JUN 08, 2021 06:39PM

What next?

Thank you for participating in this celebration of our ZDM Special Issue!

Add here - or anywhere on this blackboard using the "+" button - **your suggestions for future activities and events!**

And, remember to **press enter** so that your comments are posted.

Great event, thank you so much!

More online events!

I realize not everyone enjoys meeting online, but I appreciate the accessibility that comes with a virtual format. We are able to meet people from around the world in a cost effective way that also saves time. Grad students like me would likely not get the opportunity to travel to a physical event like this due to time and financial constraints. However, events like these have greatly added to my education and sparked new interests in me. I would love the opportunity to attend more events like this in the future without worrying about the costs of traveling.

See the attached file for a few relevant items copied from the chat (Tommy)

Also, we have anecdotal evidence from high school students: When presented with an accumulation situation in an extra mathematical context: "This is physics, not mathematics". Also: "In mathematics, you just need to know how to do it; in physics you actually need to think".

Steven Jones: Hi, I have a general comment/question, perhaps for the hosts: In this discussion, it strikes me that we all come from within "mathematics" education and there is an absence of other key stakeholders: science educators, engineering educators, and the like. This is important not only because of the high percentage of non-math majors that take calculus, but also because of the importance of future mathematicians (and hence instructors) to be exposed to those ways of thinking of calculus. What role should these other stakeholders play in shaping calculus? What plans are there to hear their voices in these kinds of efforts?

Reinhard Oldenburg: We found in our study great differences between students that also took physics as a subject and other students. Moreover, I believe that for all situations that involve modelling, differentials as Rob emphasised, are of great benefit.

Bob Rogers: In response to Steven - Using differentials and treating calculus as a tool before getting into foundations (limits, continuity, etc.) as Rob Ely suggested seems to make sense for the clients. The analogy would be that when we teach calculus, we talk about how a car engine works before we teach people how to drive.

Elena Nardi: I agree that Steven's question is very important. At IJRUME, we hope that the Special Issue coming out in July entitled "Mathematics in and for engineering education" will bring the perspectives of stakeholders outside our mathematics "bubble" to the fore.

Steven Jones: One group to tap into to help with that would be the RUME Working Group on the Interface of Mathematics and Science. We're a mixed group of calculus educators, physics educators, chemistry educators, and a few others. We've been examining this issue for a few years and have been focusing on understanding one other another in terms of how we see different math concepts, meanings we have for them, etc. I'd be happy to help to be a bridge to them, if desired.

Elena Nardi: Steven, we hope that your IJRUME SI (July 2021) with papers such as "The role of Fourier series in mathematics and in signal theory" and "Where Calculus and Engineering Converge: An analysis of curricular change in calculus for engineers" will do part of the job your comment so nicely puts the finger on!

Johnmo: Alejandro has a lot of interesting ideas on this matter - why are you not contributing, Alejandro

Chat

Word document

PADLET DRIVE

Thank you! And suggestions for future event

I appreciate being involved in this event, and want to thank Pat and Guershon for putting it together! I agree with others that the online format was great for connecting so many people around the world without the cost of travel.

I'll submit two possible suggestions for future events: (1) it has already been suggested that an event around the IJRUME special issue on integrals could be nice, and (2) (no surprise coming from me :)), I think it would be excellent to focus an event on math-science-engineering perspectives on the same calculus concepts. This would not have to be from scratch, since groups have been actively working in this area for a while now (like the RUME Working Group on the interface of

math and science that I mentioned in the chat during the meeting).

This was an excellent event!

I appreciated the structure of this event with brief engagement with the videos in advance and then the response of the authors and the discussion. The event was very informative and doable in the current extremely busy circumstances.

Also, sharing through padlet and chat works very well, many thanks to the virtual technology. I hope that we will keep these virtual events, even when we go back to face to face meetings. In the future, a discussion group around a certain theme on the teaching and learning of Calculus might be also an option.

I look forward to the next event!

This was an incredible learning experience!!! There is so much we don't know!

I greatly appreciated the organization and the structure of this event. All of the speakers were superb with their presentations. The following are some suggestions:

-I quite enjoyed seeing the visual presentation with the presenter speaking. With the Zoom format, the presenter who wants to share a presentation or PowerPoint, should be enabled as a co-host, so they can demonstrate what they want to show.

-Keep as many online as possible. I think it is great convenience for everyone, and less worry on financial expenses.

-Create breakout rooms for discussions among individual authors. Each author can have an independent Q&A session, where attendees could select and choose which room to go

to.

-Share the PDF or put the questions on a PowerPoint for individuals to see, which question goes to who.

Overall, fantastic experience! Thank you for the invitation! I look forward for future events!

Yes, online can be great!

As a grad student as well, I would like to join my voice to the person who wrote the first comment above. I hope the opportunity to participate in such events online will be kept, even after we have the possibility to travel safely. It is invaluable to have the opportunity to learn from experts and have the chance to participate in such events as a student. Also, the format was great and well adapted to online discussion: short and effective.

Thanks :)

Reproducibility and Consolidations

Thank you for the opportunity to hear from the “horses’ mouths” so to say. It is always instructive to hear from the authors about their ideas, constructs and research. Thank you.

I wonder if it would be possible for the community to choose two to three salient learning and teaching phenomena per two-year cycles and reproduce the research in multiple different locations, with different populations and build systematic know-how and theorizing. One year could be used to identify and delineate the research works to be reproduced. Conduct reproducibility of the works in the second year and build structural generative and transforming knowledge and knowings.
