CANADIAN MATHEMATICS EDUCATION STUDY GROUP

44TH ANNUAL MEETING

JUNE 5TH TO JUNE 9TH , 2020

ANNOUNCEMENT AND PROGRAM

We are delighted to welcome you to Ottawa, the traditional, ancestral, and unceded territory of the Algonquin People. Also known as the Nation's Capital, Ottawa is a unique city where you can enjoy a variety of history, culture, arts and the outdoors. Come stroll along the Rideau Canal, visit one of the many national museums and landmarks, shop in the historic Byward Market, hike in the Gatineau Hills, or swing by Parliament Hill.

The 44th Annual Meeting of CMESG/GCEDM will be held at the University of Ottawa, in beautiful downtown Ottawa. The conference begins at 6:30 pm on Friday June 5th and ends at 12:30 pm on Tuesday June 9th.

The University of Ottawa is the largest bilingual (English-French) university in the world. uOttawa has more than 40,000 students, 5,000 employees and more than 210,000 alumni. The university offers a wide variety of academic programs, administered by ten faculties, many of which are well-regarded for their quality of education and ranking in respective fields.

This year's meeting will include special joint sessions with CMS (Canadian Mathematical Society) and GDM (Groupe de didactique des mathématiques du Québec). CMESG and CMS will be held on the same campus at the same time, and the two organizations are working closely together to provide reciprocal access to the scientific programs of both conferences, including a joint panel discussion on June 8. We are collaborating with GDM on a common keynote – the closing keynote for GDM will be the opening keynote for CMESG to be held at the CMESG44 conference venue. GDM has graciously offered to open up their scientific program for June 5 to any registrants of CMESG, and any GDM participants who attend the keynote will be invited to stay for CMESG's opening reception.

Welcome and Registration

Registration on Friday will be in Lamoureux (LMX) Hall (see campus map below).The post-plenary reception will be held on campus. A barbecue will be held outside LMX hall.
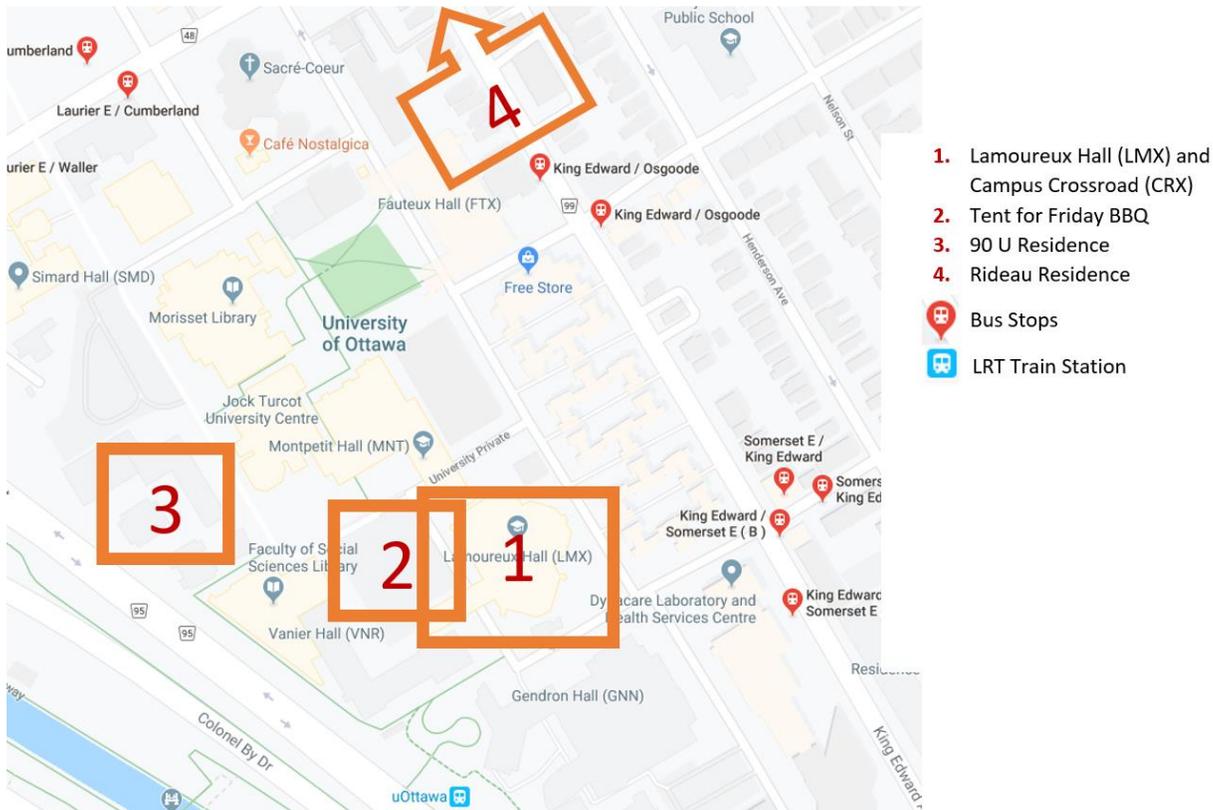
We will be providing you with a conference agenda, that will include all of the key information that you will need to know – such as official schedule, phone numbers, Wi-Fi password (please note Eduroam is

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available on campus). However, we will not be providing any mugs or water bottles, so we ask you to bring your own mug and/or water bottle to use during the conference.

CMESG events will primarily take place in Lamoureux Hall (LMX) and the adjoining Learning Crossroads building (CRX).

CAMPUS MAP

[Click here for an interactive map of University of Ottawa](#)

1. Lamoureux Hall (LMX) and Campus Crossroad (CRX)
2. Tent for Friday BBQ
3. 90 U Residence
4. Rideau Residence

Bus Stops

LRT Train Station

HOW TO GET THERE

Taking Public Transportation

In Ottawa, OC Transpo is the public transportation provider with busses and brand new light rail (LRT)! Here is the route planner for public transit: https://plan.octranspo.com/plan

The cost per ride by exact cash is $3.60, but is slightly cheaper with a Presto pass (which works with Toronto TTC Presto pass). Full fare info, including daily or multi-day (3, 5, or 7 day) pass info is available: http://www.octranspo.com/en/fares/costs/

Coming by Train

Ottawa has two VIA rail stations. The closest station to uOttawa campus is the Ottawa Train Station at 4 km away. (Fallowfield Station is in the west end).

Travelling by Light Rail the trip from the Ottawa Via Station to campus is 6 min (plus a 5 min walk from the light rail station to LMX hall). Details at: https://plan.octranspo.com/plan
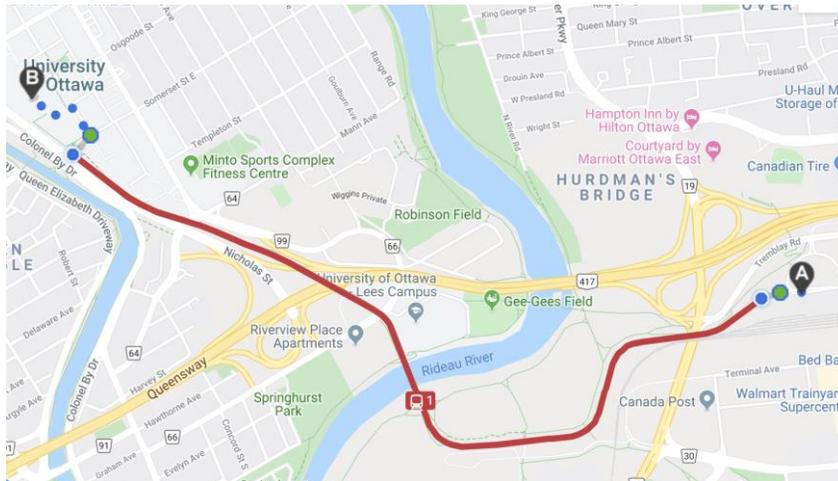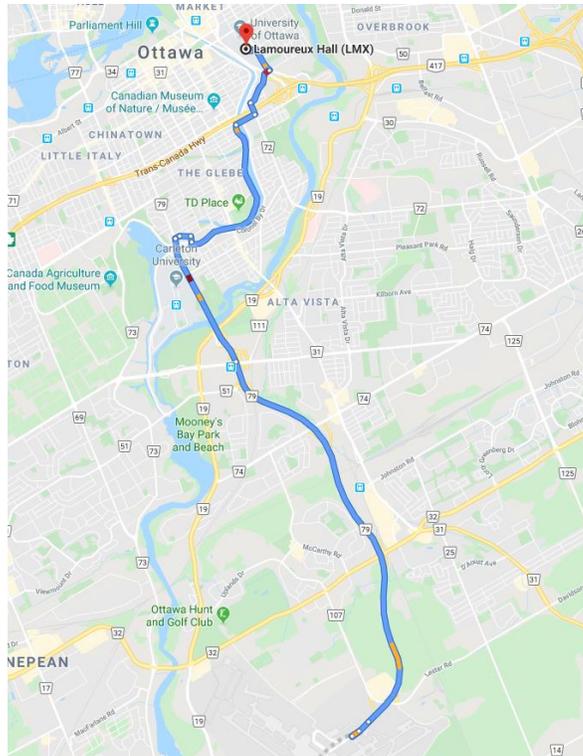

Travelling by car, taxi or ride share (e.g. uber), the trip from the Ottawa Via Station to campus about 8 min. There is a taxi stand at the train station.
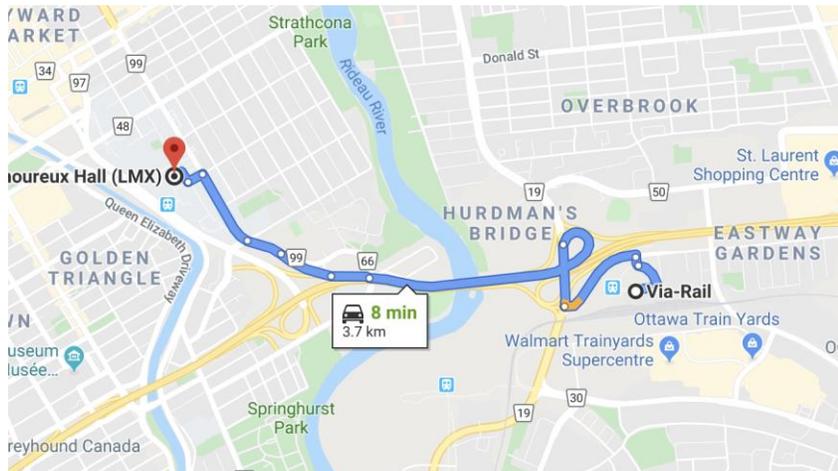
Coming from Ottawa Airport (https://goo.gl/maps/H1tNPmcLKFUkzFk28)
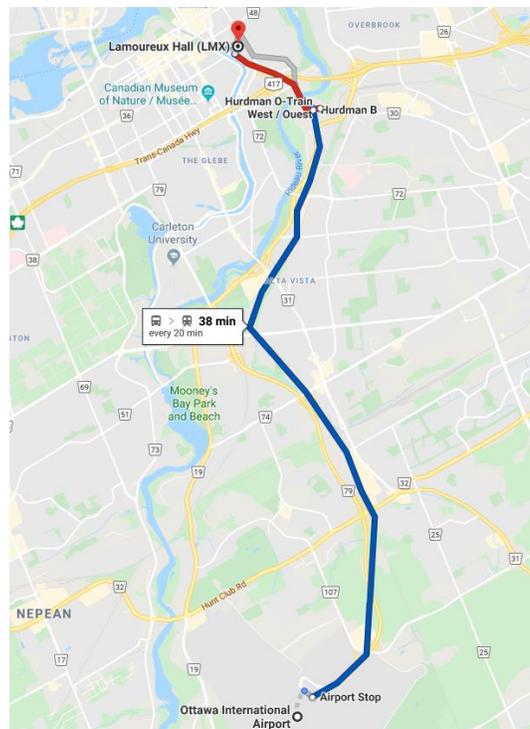
The airport is south of the university, about 20 minutes by car.

You can also take the bus (the #97 bus), which runs every 20 minutes during the day. Link here for google link: https://goo.gl/maps/tuVzpGFDdqtqZPSS8

Taxi information

The two main taxi companies in Ottawa are:

Blue Line Taxi (613) 283-1111

Capital Taxi (613) 744-3333

Coming by Car

The best advice for drivers is to use a navigation app (Google Maps, Waze, etc).

If you are coming from Montreal (or East), you have the option of travelling via Hwy 50 or Hwy 401. The routes have very similar travel times from downtown Montreal:
- via Hwy 50 West: In Montreal take Route Transcanadienne/Autoroute 15 N in Ahuntsic-Cartierville from Av du Parc and Boulevard de l'Acadie O; Continue onto Route Transcanadienne/Autoroute 15 N; Take Autoroute 50 O to King Edward Ave/Ottawa Regional Rd 99 S in Ottawa; Take exit 135 to merge onto Autoroute 5 S toward Ottawa; Autoroute 5 S becomes King Edward Ave when you cross into Ontario; turn right on Marie-Curie Private. You will be on campus very near to the LMX building.
- via Hwy 401 West: take Autoroute 20 West; 401 West; Take exit 789 for ON-138/Brookdale Avenue toward Ottawa/Cornwall; follow Trans-Canada Hwy/ON-417 W to Lees Ave in Ottawa. Take exit 118 from Trans-Canada Hwy/ON-417 W. Continue to follow Lees as it becomes King Edward Blvd. Turn left on Marie-Curie Private. You will be on campus very near to the LMX building.

If you are coming from Toronto or Kingston (or West):

- via Hwy 401 East: merge to 416 North, merge to 417 East. Take exit 118 (Nicholas Street/Lees Avenue). Continue to follow Lees as it becomes King Edward Blvd. Turn left on Marie-Curie Private. You will be on campus very near to the LMX building.

Renting a Car

Some participants may wish to rent a car. We have arranged for a 5% discount at Enterprise Rent a Car and a 10% discount at National Car Rental. CMESG travellers have access to both of these brands at the Ottawa Airport. Check back closer to the conference dates for a discount code.

PARKING

As with all downtown campuses, parking is a challenge. We strongly recommend walking or taking public transportation if possible (OC Transpo travel planner here: https://plan.octranspo.com/plan).

If you are travelling to uOttawa by car, there are two options for **weekdays** (Monday to Friday) dates with a price of $5.50/hour with $17.50 Daily Max:

> Brooks Garage ([100 Thomas More Private](#)) - 2 min walk to CMESG site (LMX hall)
> Mann Garage ([801 King Edward Avenue](#)) - 10 min walk to CMESG site (LMX hall)

For the **weekend**, there is different pricing ($5.50/hour with $9.00 Max) and an additional parking garage (Desmarais Garage - 5 min walk):

> Brooks Garage ([100 Thomas More Private](#)) - 2 min walk to CMESG site (LMX hall)
> Mann Garage ([801 King Edward Avenue](#)) - 10 min walk to CMESG site (LMX hall)
> Desmarais Garage ([55 Laurier E. Street](#)) - 5 min walk to CMESG site (LMX hall)

As a reminder, we are partnering with other conferences, including CMS who anticipates approximately 700 participants so campus parking is likely but not guaranteed.

For more details about parking at uOttawa please visit: https://www.uottawa.ca/parking/parking-services

Street parking near the University is closely patrolled by city by-law officers. Most close street parking has city payment (2 hour max, very expensive). The next street parking zones are 1 or 3 hours and are very closely patrolled and frequently ticketed.

ACCOMMODATIONS

The local organizing committee has arranged for blocks of rooms at discounted prices at the following venues. Please be sure to enter the appropriate discount code when booking your rooms. If you have questions related to accommodations, please email Ann Arden (ann.arden@ocdsb.ca).

uOttawa Residence Options

90U (https://www.uottawa.ca/housing/summer-accommodation/residences/90u)

The 90U residence is a two minute walk from LMX hall. At 90U, the air-conditioned units include two separate bedrooms, a kitchenette equipped with microwave, fridge (kitchenware is not included), and a private washroom with shower. Each bedroom has a double bed, a television, and a desk and chair. Suites can house a maximum of four people. The price is $130/night plus HST.

Rideau Residence (https://www.uottawa.ca/housing/summer-accommodation/residences/rideau)

Rideau Residence is located at 290 Rideau, on the corner of King Edward Avenue and Rideau Street, a pleasant walk of 10-15 minutes from campus and conveniently located near many tourist attractions in the downtown and Market area. At Rideau Residence, the air-conditioned double rooms include two

double beds, a desk and chair, and a private washroom with shower. Each room includes a television and mini fridge. The price is $130/night plus HST.

To book at either residence:

- Go to https://www.accommodation.uottawa.ca/ (you can toggle to English in top right corner)
- Enter the Promotional Code: CMESG2020
- Select the dates : June 5th – June 9th 2020
- **If you want to stay at 90U, we strongly encourage you to book ASAP**. The CMS summer meeting is also being held on campus
- Reservations made after April 10, 2020 will be based on availability at prevailing rates.
- if you have questions, you can call 1-888-564-4545
- For **accessible rooms**, please phone directly to book 1-888-564-4545
- There are other residence options available for booking on the same website, but the promo code does not apply.

Hotels

Lord Elgin (100 Elgin St, Ottawa, ON K1P 5K8) (613) 235-3333

https://lordelginhotel.ca/

The Lord Elgin Hotel is a 15 min walk to LMX Hall. Classic rooms: $209.00 single/double occupancy per night (based on availability with a cut-off date of May 5, 2020. After this date, neither the rate nor availability is guaranteed). There is a 7 day cancellation policy on all guestroom reservations.

Guests can either book rooms via e-mail groups@lordelgin.ca, or call 1-800-267-4298. Make sure to mention "Canadian Mathematics Education Study Group or CMESG" or group code #200605CMES when calling or e-mailing.

Novotel (33 Nicholas St, Ottawa, ON) (613) 230-3033

https://www.novotelottawa.com/

The Novotel is a 15 min walk to LMX Hall. Superior Room with King Bed at $179 per night, rates are subject to 4% MAT & 13% HST; Hot buffet breakfast priced at $19.50 plus taxes per person per day, breakfast served in Heritage room; complimentary Wi-Fi in the room and public areas.

Guests can book rooms in any the following ways:
- call Hotel directly at 613 230-3033 and refer to Block code #950210 CMESG/GCDEM2020
- call toll free number at 1-855 677-3033 and refer to Block code #950210 CMESG/GCDEM2020
- email hotel at groupreservations@novotelottawa.com and refer to Block code #950210 CMESG/GCDEM2020
- Click on Online Booking Link: CMESG/GCDEM2020 (https://book.passkey.com/event/50040301/owner/5484/home)

Other Options

Ottawa also has many other choices for accommodations, including Airbnb as well as other hotels in the vicinity.

MEALS

All lunches and dinners will be taken with the group, except for dinner on Saturday (which will be dinner on your own). There are plenty of local restaurants all within walking distance of the university for you to try. We will be providing lists of places to eat and drink with your registration package when you arrive.

Details will be finalized soon.

EXCURSIONS

On Sunday, our primary excursion will be lovely. Details will be finalized soon.

EMERGENCY

In case of emergency during the conference, you can contact Ann Arden via mobile 613-698-7596 or via email ann.arden@ocdsb.ca.

FEES

The conference fee ($210 if registration is received by April 21st and the full payment before May 9th; $ 240 thereafter) covers the cost of the reception on Friday, lunches on Saturday, Sunday and Monday, dinners on Friday, Sunday and Monday, coffee breaks, the Sunday afternoon excursion and other local costs.

The academic program fee is $ 110 for all participants except full-time graduate students, for whom the fee is $ 60. This fee is waived for all *invited* presenters (plenaries, working groups, topic sessions, New PhDs).

Please note: "Ad Hoc" and "Gallery Walk" presenters are required to pay the academic program fee.

All members of CMESG are also members of the FLM publishing association.

You are invited to meet the FLM journal editor, managing editor and board members at the annual Friends of FLM. This is an informal welcome event organized by the association and an opportunity to learn more about FLM. What makes FLM different? It's the people and more! Everyone invited. Drop by. Refreshments provided. Timing & location details TDB.

ABOUT THE CONFERENCE

CMESG is not a typical academic conference, for it is not organized around presentations and audiences. Instead, it is a conference based on *conferring*.

Its main feature is the **working group**. Each working group will meet for three full mornings to interact around a particular topic. There are two **plenary speaker sessions** which will each address the whole conference. In contrast with other conferences where questions are often taken at the end of the presentation, a time slot is assigned for the audience, broken into small groups to discuss and prepare questions that will be presented to the speakers in a question period. Two other types of sessions provide more traditional forms of presentation: invited **topic sessions** and the **new PhD sessions**.

Over the course of a meeting (and from meeting to meeting) various discussions and ideas emerge among CMESG members. Our program is designed with time and space for members to come together to work on their emergent ideas. In order to facilitate **Ad Hoc discussions**, there will be a notice board available to request and announce the sessions. Local organizers will assign space for the sessions posted. The nature of the spaces available for ad hoc sessions will reflect the discussion format and the number of sessions proposed. Ad hoc proposers should not expect access to a classroom, computer, projector or power. Hence sessions proposed should be designed with this in mind. There is no reduction in conference fees for presenters in this category. Note— Any person(s) having work prepared in advance to share at the conference should register for the **CMESG Gallery Walk**.

The CMESG Gallery Walk is intended to provide a forum for members to contribute to our meeting and in doing so enhance our awareness of each other's work. We hope this session will increase opportunities for showcasing members' work and building networks among members. We encourage a range of contributions from research posters, to presentations on community initiatives, from mathematics problems, to mathematics art works, anything that can be shared in a gallery format (imagine a poster session or math fair). The session will be broken into two parts allowing every member to participate both as a presenter and

as a "walker." One of: a poster board, a piece of the wall, or a table will be provided for each presenter. Presenters will have to supply their own materials and computers (note also, power may not be available). There is no reduction in conference fees for presenters in this category. For more information about this session please contact Peter Liljedahl: liljedahl@sfu.ca.

Finally, there is a session that many of us highly value: **meals**! Sit with those you know, sit with those you are getting to know, sit with someone you don't know – the meals are an integral part of the conferring that makes CMESG such a special conference.

SCIENTIFIC PROGRAM

PLENARY LECTURES

Lecture I *Keith Weber* Rutgers University *Joint session with GDM*	*Re-thinking how mathematics educators think about proof*

Many mathematics educators want students to develop the same beliefs about justification, proof, and certainty that mathematicians hold. Naturally, trying to achieve these instructional goals requires mathematics educators to think carefully about how mathematicians' understand proof and how students' perceptions of proof can be validly measured. The purpose of this talk is to investigate these foundational issues, and to argue that as a community, we may be thinking about these issues in the wrong way.

First, I will present the results of a mixed method study demonstrating that mathematicians are not certain that a theorem is true immediately after reading a proof of the theorem, and that mathematicians continue to seek empirical evidence in support of the theorem after reading its proof. I will use this result to challenge studies that evaluate students negatively for not gaining certainty from proofs in a short period of time. Second, I will present the results of a qualitative classroom based study illustrating how students frequently justify their mathematical claims empirically. They did so not because they believed empirical justifications could provide certainty or were superior to deductive justifications, but rather because they lacked the motivation to seek a better justification or they felt they lacked the resources to produce a proof. I use this result to call into question the common methodology in mathematics education research of inferring students' beliefs about mathematical justification from the justifications that they submit.

Lecture II *Christiane Rousseau* Université de Montréal	*Mathematics is everywhere*

Mathematics is everywhere: this is the theme that was chosen for the celebrations of the first International Day of Mathematics on March 14, 2020. Even if it is not new, this theme remains very promising and should always be present in our teaching. One of the most important questions that pupils and students ask is *"What is mathematics useful for?".* In fact, mathematics is everywhere in science and technology, as well as in the organization of civilization. *"Give me an activity and I'll tell you where the math is."* This first sub-theme will be illustrated with examples from various fields. In particular, mathematics allows us to *see* what we cannot see with our eyes. But it is not enough to tell young people that there is mathematics hidden around them. You must also help them to discover the math by themselves: *"Mathematics is in everything you do."* is a second sub-theme.

PANEL

Panelists TBA *Moderator: Peter Taylor* *Joint Session with CMS*	*Theme: Seeking common ground*

TOPIC SESSIONS

Topic Session A Ann Anderson, *University of British Columbia*	*Centering children's mathematics thinking in our teaching: A plea for 'live' experiences*

Central to my praxis as a mathematics educator, over the last 30 years or so, has been the development and implementation of experiences wherein Teacher Candidates and practicing teachers elicit and respond to young children's mathematical thinking in real time. In this topic discussion, I plan to share the ways in which two substantive (longitudinal) assessments ("Math Fairs Portfolio" and "Problem Solving Labs") support beginning and experienced teachers' reflective practice, with a focus on "responsive teaching" (Jacobs & Edmonds, 2016). In essence, I want to explore how centering children's mathematics thinking during such tasks highlights that "teachers' instructional decisions about what to pursue and how to pursue it are continually adjusted during instruction in response to children's content-specific thinking, instead of being determined in advance." (Jacobs & Empson, 2016, p. 185) In doing so, I intend to learn from those colleagues who attend about similar offerings, and to debate the value and role of 'live' experiences such as these, within our mathematics education programs, and the community settings in which they occur.

Topic Session B Barbara Graves, University of Ottawa	*A mathematical conversation among young children and their teacher*

In this presentation, I draw on Maturana and Verden-Zöller's, *The origin of humanness in the biology of love* (2008) to understand how love, a biological phenomenon, may be realized during a mathematical conversation. Within the mathematics education research community, Maturana is most widely recognized for his interdisciplinary theoretical work on the biology of cognition (Maturana & Varela, 1980, 1987), which emphasizes a non-representationist stance that the world we know is brought forth as we engage in interaction with others (1987, p. 244). The more recent work of Maturana and his colleagues focuses specifically on love as a relational domain of "behaviours through which another arises as a legitimate other in coexistence with oneself" (Maturana & Verden-Zöller, 2008, p. 50). Love, in this work, "is not a special emotion or virtue—rather it is a biological phenomenon through which social life arises and is conserved" (p. 50). In order to reflect on how love, a biological phenomenon, may be realized during a mathematical conversation, we will consider a mathematical conversation among 12 children and their teacher in a grade 1-3 multi-age classroom. The children are invited to share their solutions, expressed as visual artifacts, to a geometry problem. We know that children socially invest a great deal of themselves in expressive writing and drawing which suggests that that we would do well to consider these expressions with focused attention. Drawing on video recordings and mathematical artifacts we will attend to the mutually constitutive nature of their mediated interactions realized through semiotic resources as well as through their movements, gestures, and sensory expressions in order to possibly arrive at an enhanced understanding of human performance.

References

Maturana, H. R., & Varela, F. J. (1980). *Autopoiesis and cognition: The realization of the living.* Dordrecht: D. Reidel Publishing Company.

Maturana, H. R., & Varela, F. J. (1987). *The tree of knowledge: The biological roots of human understanding.* Boston, MA: Shambhala.

Maturana, H. R., & Verden-Zöller, G. (2008). *The origin of humanness in the biology of love.* Imprint Academic, USA.

Topic Session C JF Maheux, *Université du Québec à Montréal*	***Time and the deconstruction of traces of mathematics in the classroom***

Over the last decade, scholars began conceptualizing mathematics and mathematical activity as something that not only dynamically evolves, but *lives* throughout people's (like teachers and students) writing and reading, talk, movement, and so on. One hard question that is seldom addressed in those conceptualizations is in relation with *time*, and more specifically: how is ("known") mathematics brought into (and out of) actual mathematical activity? In his *Origin of Geometry*, Husserl somehow tackles this question by asking: How did geometry occurred for *the first time*, and how can we do geometry today *without* starting from scratch? Husserl's reflections nourished Derrida's work on traces and references as a way of understanding how past, present and future co-emerge through life itself: "The concept of trace is coextensive with the experience of the living in general: as soon as there is reference to the other or to something else, there is trace". In this topic session, I will illustrate how and why I strive to articulate such ideas with what takes place in the mathematics classroom. To do so, I will draw on an analysis of a fragment in which a teacher discusses with a group of students the production of equivalent fractions by cancelling digits (16/64=1/4), highlighting how traces on the board help mathematics occur as something that is (temporally) both present and absent.

Topic Session D Jamie Pyper, *Queen's University*	***Questioning what I am doing as a mathematics educator for secondary school mathematics preservice teachers – looking at research and finding an answer!***

What am I doing as a mathematics educator?
    Teaching pedagogical content knowledge (Shulman, 1987) to preservice teachers.
How am I teaching them?

Direct instruction, activities designed with a social constructivist lens, discussion, and student presentations, often framed as content or as teaching practice concerns such as curriculum, task selection and analysis, and student learning activities that are relevant to the mathematics classroom (Kastberg, Sanchez, Edenfield, Tyminski, & Stump, 2012).

Why am I doing it that way?

Because I considered those to be the strategies they need to employ themselves as teachers, and that is how I saw their learning of pedagogical content knowledge.

What I think was learned?

Tricks and tips in mathematics education.

What I wanted for preservice teachers?

To be critical thinkers and holistic thinkers of pedagogical practice, and connected to learning and the learner (e.g., insight from Yearington, 2010).

How can I do <u>that</u>?

A learning model that provides multiple access points and learning trajectories… such as Problem-Based Learning (PBL). Consider the five goals that underlie PBL:
"Construct an extensive and flexible knowledge base;
Develop effective problem-solving skills;
Develop self-directed, life-long learning skills;
Become effective collaborators; and
Become intrinsically motivated to learn" (Hmelo-Silver, 2004, p. 240).

Recent research data and results on PBL as a preservice learning model show significant increases and important changes in teacher efficacy, mathematics beliefs, critical thinking, and attention to the aspects of pedagogical content knowledge for the secondary school mathematics teacher. This Topic session highlights some recent research and experiences of secondary school preservice teacher learning and PBL as a preservice learning model; using social network analysis (Borgatti, Everett, & Johnson, 2018) and the triangulation of data, to sound, what seems to me, a very clear and compelling call to action.

References

Borgatti, S. P., Everett, M. G. & Johnson, J. C. (2018). *Analyzing social networks*. Thousand Oaks, CA: Sage.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), 235-266.

Kastberg, S., Sanchez, W. B., Edenfield, K., Tyminski, A., & Stump, S. (2012). *What is the content of Methods? Building an understanding of frameworks for Mathematics Methods Courses*. Proceedings for the Thirty-fourth Annual Meeting of the North American Chapter of the Psychology of Mathematics Education. Kalamazoo, MI.

Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*, 1-22.

Yearington, T. (2010). *That Native thing: Exploring the Medicine Wheel*. Ottawa, ON: Borealis.

Topic Session E Annie Savard, *Université McGill*	*A conceptual framework on the epistemological intersection of financial numeracy: Between mathematics and financial education*

Financial Education has been getting more attention since the worldwide financial crisis in 2008. For instance, in 2012, the Organization for Economic Co-operation and Development (OECD) launched an assessment program PISA on Financial Literacy among 15 years old students. Some Canadian provinces participated in 2015 and in 2018. Furthermore, in recent Canadian curricula (Québec, Ontario, British Columbia), the use of the terminology financial mathematics has emerged. It is not new that Mathematics plays an important role in regard to Financial Education, because Mathematics Education has a long tradition of teaching about money and to use financial contexts in problem solving tasks. Despite this tradition, the roles of Mathematics and Financial Education have not yet been conceptualized by scholars coming from Education.

This communication will present a framework built from the work I have done in this field since 2004. This framework highlights the intersection between Mathematics and Financial Education and proposes different layers of this intersection named financial numeracy. This framework is a first step to conceptualize the field of financial numeracy.

Topic Session F Marian Small, *Rubicon Publishing*	*Enriching math thinking: K to university by opening up questions to focus on ideas and not just answers*

Many of our students, K – university, think of math as a subject where the goal is to determine correct answers to very specific questions. Although that is certainly a part of math, we lose students who prefer to demonstrate their creativity, not their ability to conform. I've even been told by students that they don't like math because they are creative. One of the ways to engage those students, whether elementary, secondary, university or college students, and attract them to the subject area we love is to use more open-ended questions that allow an opportunity for "creativity" and leave room for opinions. For example, consider the difference between these two questions-: Factor $2x^2 – 6x – 20$ as compared to In what situations do you think it is fairly easy to factor quadratics? What makes it easy in those situations? Or these two: Subtract 2 ½ – 1 ¾ as compared to Create a realistic situation where you'd subtract two mixed numbers less than 5. There are still appropriate and inappropriate responses, but there is much more latitude for appropriate responses. This talk will provide many examples for you to consider, whatever

your grade levels of interest, will really dig into why these questions make a difference, and will give you an opportunity for input as well.

WORKING GROUPS

Working Group A Joyce Mgombelo, David Reid	*Learning Theories*

Working Group B Richelle Marynowski, Jhonel Morvan	*To test or not to test: Is this the question?*

Working Group C Scosha Merovitz, Mathieu Thibeau	*Using video as a tool in research and practice: Rewards and challenges*

Working Group D Wes Maciejewski, France Caron	*Large Classes*

Working Group E Evan Throop Robinson, Laurent Theis	*Learning mathematics in the early years*

Working Group F Florence Glanfield, Cynthia Nicol	*Learning from / on / with Land / Place : Imagining Possibilities for Braiding Indigenous Worldviews, Mathematics, and Teaching*

Working Group G *Kathy Nolan, Sarah Mathieu-Soucy Tara Taylor*	***Returning to our roots: Exploring collaborative possibilities for research and teaching in mathematics and mathematics education***

NEW PHD SESSIONS

Information coming soon