

CMEF 2009 PANEL I REPORT WHAT DID I NEED THEN? WHAT DO I NEED NOW?

Chair:

Egan J Chernoff
egan.chernoff@usask.ca

Panelists:

Michael Finnigan, Yale Secondary School
Cindy Clarke, Prairie View School
Darien Shannon, New Westminster Secondary School
Shannon Sookochoff, Victoria School
Ann Arden, Osgoode Township High School

According to the *Plenary sessions and Panel discussions* portion of the 2009 CMEF website (<http://www.cms.math.ca/Events/CMEF2009/schedule#pp>), the abstract for Panel I (my bolding) reads as follows:

This strategically placed presentation will set the tone for the meeting. We are here to listen to the voice of the teachers. We want to better understand both their years of education and their years of service. What is the nature of the community, the support and the resources that they need at both stages of their professional growth and work. This voice will inform our future research agenda and will guide the formation of collegial support structures, both personal and web-based. We anticipate 40-50 minutes of presentation followed by 30 minutes of discussion and response from researchers.

The panelists, with respect to the emboldened portions presented above, had an important (and perhaps overwhelming) task in front of them. However, based upon feedback gathered, Panel I and the panelists (Ann, Cindy, Michael, Darien, and Shannon) played an integral role in setting the tone for CMEF 2009. More specifically, Panel I set the tone for CMEF 2009 in two ways. First, the themes that arose during the presentations, question responses, and discussions of Panel I remained as topics of conversation, in both formal (e.g., working groups) and informal (e.g., coffee break, lunch) settings, long after our official one hour and fifteen minute time slot was finished. Second, and perhaps more importantly, the ability of colleagues with diverse backgrounds to converse, modeled in the room that day, also continued long after Panel I was ‘over’.

In the reports that are to follow, each panelist was given an opportunity to document their CMEF 2009 experience. Building upon the Panel I theme (What did I need then? What do I need now?), each panelist’s report is broken into two sections: *What I wrote then*. *What I write now*. In *What I wrote then*, each panelist documents what they wrote before taking part in Panel I; and in *What I write now*, panelists take the opportunity to (1) revisit their original writings and (2) revisit their CMEF 2009 experience.

**Michael Finnigan, Yale Secondary
Abbotsford School District #34 (Abbotsford, BC)**

What I wrote then

What did I need then?

As a student going through high school and then university I needed my resources (teachers, colleagues, books) to be very clear with their direction and purpose. I needed teachers that gave specific instructions, friends that offered clear help and texts that gave examples of strategies and methods because once class was out and I went home... I was on my own. There was not the luxury of the internet, MSN, group study sessions (not where I lived) and other ways to learn.

As a young teacher starting in the 80's I needed "stuff". Worksheets, lesson plans, tests, quizzes, more tests, more worksheets, more MORE MORE!!! I couldn't get enough as throwing more paper at students gave them more chance for success and practice. Oh yes, those days of handing out factoring sheets with 50 examples were great!!

What do I need now?

Tablet PC's, web-based instruction, brain research, dealing with more "specialized" students, appeasing parents who no longer consider the math teacher as a god (lower case g) and the ever changing curriculum are just a few things that drive my needs now.

The push towards PLC's, PLO's, AI's and all the other well meaning movements all require one thing, a teacher to stay in touch with the ever changing landscape we call the classroom. If you taught the same way you were teaching (or were taught yourself) 20 years ago you will soon find yourself left behind. The internet has changed education as we once knew it and we are no longer able to "drill and kill" as we once did. In my brief time I hope to address some of these concepts and hope to spark a rich discussion afterward.

What I write now

The CMEF experience showed me that I am not alone in my struggle for pedagogical perfection. Though my own struggles dealt with the keeping up on technology and using it to my students' advantage, I was impressed that many of my colleagues had completely different struggles. It impressed me at first because I thought they had mastered what I struggled with (otherwise they would have mentioned it) and that they had "moved on" to a higher level of struggles. As usual, my assumptions were incorrect as I spoke with different panelists and other people at the conference and soon discovered that my yearning to keep abreast of technology was only a part of their own struggles and that indeed the items they mentioned were things that would make me a better educator should I master them. The conference is unique in that it takes educators from all levels of the system from elementary to University; from teacher to administrator and helps us

all see things from a different perspective. So many "teacher" conferences have one channel that we all stream in to. This conference was rich in its diversity and challenging in its focus.

**Cindy Clarke, Prairie View School
Prairie Spirit School Division #206 (Dalmeny, SK)**

What I wrote then

What Did I Need Then?

Confidence. As a teacher candidate and subsequently a beginning teacher, I required enough training and exposure to exemplary mathematics teaching that I could risk stepping beyond my definition of myself as challenged in mathematics to teach students with confidence.

Mentors. While I encountered many colleagues in the first few years of my teaching career who were helpful and supportive, what I really needed was a formal mentorship program that provided regular and specific support as I negotiated how best to teach my students, some of whom were exceptionally challenged, particularly in the area of mathematics.

Resources. Often the resources we have access to in our first few years of teaching become the primary drive for our methodology. In my first year of teaching, I needed access to resources that expanded my definition of mathematics teaching and provided concrete examples of how to create learning spaces and opportunities where students could explore and develop their mathematical understanding in a spirit of inquiry. While the training I received as a pre-service teacher at the University of Saskatchewan shifted my philosophy of mathematics teaching and opened me up to a richer understanding of how children best learn, I entered the profession in a different province and in a school where none of the physical resources I had learned to use at University were present. Over the years I did learn how to beg, borrow, and create my own resources but it was in those first couple of years that I most needed a well-stocked classroom so that I could focus my energy on teaching rather than collecting items to teach with.

More Professional Development and Networking Opportunities. My first years of teaching did provide opportunities for professional development and networking; however, as an elementary teacher and then a special education teacher the two or three opportunities in a given year did not sufficiently provide opportunities to focus on any one area for more than a brief day. I clearly remember the Beginning Teacher's Conference in Alberta that I attended in my first year of teaching. One of the sessions I managed to attend was with a teacher who was demonstrating her use of a resource that used games with dice and cards to teach fundamental mathematics concepts. Now, that seems quite basic and obvious but at the time I was completely awed by what I saw as an amazing and innovative way to approach teaching a subject that some of my students disliked or believed they would be unsuccessful in. I was recently at a teachers' association conference where a speaker challenged us to imagine what it would be like if

first year teachers were hired fulltime but only had halftime teaching duties, providing time for a mentor, other colleagues and professional opportunities in the field to unfold on a regular basis and in a focused way during that first year. The speaker went on to invite us to imagine what it would be like if in their second year, teachers were paired with mentors and continued to be provided with paid time to develop and hone their teaching skills in the field. Too often, the first year teachers are required to teach the most difficult classes with the least amount of support.

What Do I Need Now?

A Climate Where Inquiry and Innovation are Encouraged. The work of reflecting on practice and shifting teaching methods concomitantly with an evolving teaching philosophy requires a climate where growing as a practitioner is not only encouraged but also actively supported. Even school divisions that philosophically support professional inquiry are limited in their abilities to support that inquiry due to under-funding of educational initiatives. While some school divisions could definitely do a better job of supporting their teachers, even those who are committed to professional growth need the support of their provincial governments not only in terms of money but also with respect to validation and a deeper understanding of the ongoing benefits of providing practicing teachers with opportunities for growth. I'm not sure whether this requires a broader campaign to help shift public opinion regarding how teachers are or should be using their time or whether it needs a stronger commitment from government to fully understand how best to create growth that leads to improved student outcomes. Under the auspices of accountability, teachers are being forced to engage in activities that are counter-productive to their own growth as a teacher and, more importantly, to the development in their students of strong and lasting understanding, particularly in the area of mathematics. While my own province has been undergoing curriculum renewal that has seen a refocusing of mathematics curricula on problem-solving as the basis for all mathematical understanding, the same Ministry has begun to explore the use of standardized assessments to measure student progress without fully exploring the impact on teaching of the implementation of such assessments. When I say that a climate of inquiry and innovation need to be encouraged, I refer not only to our schools and school division but also to our provincial ministries of education where curricula are being set and standards of practice determined.

Continued Opportunities for Research and Collaboration. One of the most difficult parts of engaging in reflective practice and research to understand student learning more deeply is negotiating the time required to do such inquiry. Obviously, I have been provided with time because I am here at this conference. I have been engaged in ongoing research into mathematics assessment and student identity for two years, during which time I have been provided with both release time and with funding through the Sterling MacDowell Foundation to support that research. I have been very fortunate. Having said that, I still engage in this inquiry in between everything else that I do as a teacher including but not limited to my classroom and administrative responsibilities. Many of my colleagues are also actively seeking ways to teach students more effectively "on the fly." What would happen, I wonder, if teachers were encouraged to engage in periodic inquiry themselves not two or three days out of a school year but on a regular basis? How would our own teaching shift if we were provided with the time to connect with

others *regularly*, engage in discussion and debate *regularly*, and *regularly* try out some of the things we are discovering through this inquiry?

Courage to Support Seasoned Colleagues to Imagine a Broader Understanding of Mathematics Teaching. One of the most difficult aspects of teaching can be the isolation that is fostered by teachers working independently in classrooms without contact or intellectual exchange of ideas with colleagues. I have been fortunate to connect with several colleagues within my own division and in neighbouring divisions who share my passion for exploring what is possible in terms of growing into a deeper understanding of student learning. I'm sorry to say that I have also encountered colleagues who are disparaging not only of the ongoing work of myself and others around shifting perspectives with respect to mathematics teaching but also of our subsequent success with students previously thought to be at risk for failure in mathematics. Maybe it is the way of the world or human nature that there will always be people who resist change or who are threatened by the evidence of a need for change. I am perhaps still naive enough to hope that these people are few and far between and that there is a chance, at least, of persuading them to try different methods of reaching children in their mathematics teaching. More and more I see that much of the work we are doing is not so much new as it is new to particular sectors of the profession. Why, when we know what students need, when we have solid research to support that contention, when our own students' struggles with mathematics demonstrate that we are just not getting it right, do we continue to be rigid about changing the ways in which we teach? If we open our minds to the possibilities, at least we have a chance of reaching children.

What I write now

A Narrative Reflection on CMEF 2009

Perhaps it is too early to reflect on the Canadian Math Education Forum 2009. It is 10:00 p.m. Saskatchewan time – 9:00 p.m. Vancouver time. My colleague and I are back at the hotel room and anticipating a very long drive ahead of us tomorrow as we make our way back home. For us, the conference is over. Tonight, the city is hot and humid, leaving us feeling lethargic and spent. Part of our lethargy is the exhaustion that naturally comes after the adrenalin rush of presenting. The panel was two days ago but it feels as exhausting as if I had just left the stage.

Upon reflection, I am struck immediately by the cohesiveness of the panel. We are all from very diverse backgrounds both educationally and professionally. We each have a different focus and a different philosophy or committed belief that drives our practice and our research. At the same time, we are all connected by our dedication to students and to student learning. I think I must have expected to disagree more with the views of at least some of the panel or, certainly, of the audience. In the end, we were all wondering and discussing how best to meet the learning needs of our students. There is something very comforting in that realization.

As I have engaged in research related to student identity and mathematics assessment, I have often wondered if it is my job or my duty to shift the perspectives of other mathematics teachers so that they, too, reach for more effective ways of teaching mathematics and assessing mathematics. I experience some dissonance around the idea

that I should, somehow, change others. Yet, that is what we may very well have done through the course of our panel discussion. It seemed from my perspective, at least, that people in the audience were thinking deeply about questions that were arising from the panel discussion and were, perhaps, asking themselves what might need to be done differently. Still, I struggle with the idea that I have a part to play in that process. Isn't it more appropriately my job to reflect on my own practice and to share whatever insights have come to me? To share the wonders that arise, the moments of confusion, the apparent epiphanies?

The experience of participating in the panel, as well as the working group at CMEF 2009, has led me to question who I am in the larger schema of mathematics. Am I an evangelist, converting people to the "right" way of teaching and assessing mathematics? Am I a revolutionary, stirring things up, agitating, advocating, fighting for what I believe is "right"? Or, as one person at the forum put it, am I a virus, infecting others and spreading exponentially? I don't like any of these analogies. I am never just one of these things. I think, rather, that I am merely a person wondering how better to support student learning – an endeavour as big as any revolution but as small as each day opening up onto a classroom full of children. It's true that sometimes I have to fight because others are adversarial (or I am cranky from too little sleep or too much marking). Sometimes I get excited about what my students are doing and I bowl over others in my zeal to share my amazement. Mostly, I just want to do the best I can for the students that I encounter and, through CMEF, perhaps even some of the students I don't encounter but whose teachers are intrigued by the things I've said and the experiences I've shared.

I find these conferences exhausting. It is not in my nature to be out in a crowd of strangers speaking plainly what I think. Others who know me will, no doubt, dispute that claim because I fake my comfort with the process well. The truth is it is hard to be there amongst the crowd, no longer anonymous. This work has forced me to move outside of my comfort zone and to engage with other colleagues around issues and ideas related to teaching students in ways that improve student learning. Here's the thing – I want to be a better teacher. I want to get better at helping students to learn and to grow. So, I move out of my comfort zone to connect with other teachers who also work hard to improve their practice. We all found a safe place for open, honest dialogue at CMEF 2009 and I am convinced the opening panel set the stage for that environment. Despite our differences, despite our fears, we came together and said what needed to be said before breaking out into working groups that put those beliefs into practice. It feels like a beginning. It feels like we will carry this work forward. My hope is that we will take the flavour of inquiry that was encouraged at the CMEF and share it with our colleagues and our students.

The humidity has broken now and rain is drumming against the window, the alley, the tops of cars as they pass on West Hastings. I am anxious for morning to come so that I can leave and go home – not just to get home and sleep in my own bed but also to get home and begin to act on the ideas that were shared here. My thoughts drift to a scene I witnessed earlier. Four women sit in a coffee shop on the corner of Richards and West Hastings in downtown Vancouver. They are clearly tired – one brushes the hair out of her eyes. One stretches. Each, however, is engaged in the conversation that they share, leaning toward each other as they speak. They are talking about math. They are sharing stories of things that their students have said to them during mathematical conversations.

Their enthusiasm over their students' ideas catches the attention of people sitting near them but they don't notice. It is teaching that has grabbed them. It is student learning that has engaged them. It is the collegial atmosphere encouraged and supported by the days spent discussing mathematics at the CMEF 2009 that has brought them here at this time and in this space to discuss how they are teaching mathematics and to reflect on how that practice might change in the future, in a coffee shop in downtown Vancouver. I am awe-struck by the improbability of the scene. Then, it occurs to me. This is it. This is what the CMEF is all about – to get excited about teaching students, to share with others who are equally excited, and to go back to our classrooms both exhausted and rejuvenated.

**Darien Shannon, New Westminster Secondary School
New Westminster School District #40 (New Westminster, BC)**

What I wrote then

What did I need then?

What I needed to succeed in my teacher education program and in my first few years of teaching was very different from what I need to succeed now. The skills I use have changed. Throughout my teaching program it was about survival and getting as many resources as possible. This was the situation when I began teaching as well.

What do I need now?

Opportunity for growth and exposure to new/different ideas. After the first couple of years I found my enthusiasm for teaching started to ebb. It is much too easy to fall into a rut, going through the motions day in and day out. I needed something to rejuvenate and revive my interest in teaching and learning. I found this primarily through the masters program at SFU. Through the program I was introduced to other teachers in different career stages around the lower mainland. These people were in a similar situation as I was and we were able to share ideas and look at teaching from different viewpoints. The teachers I met were a resource and continue to be a resource for ideas and materials since the completion of the coursework. The students in the program were only one resource. The professors were another. The enthusiasm and experience they offered was exactly what I needed to renew my own interest and excitement about teaching and about mathematics. I chose to do the thesis route for my masters and this has changed how I view my students and how I teach them. I am constantly considering their motivations and thinking of how best to present material to them. This conference is another venue for sharing ideas and is an opportunity for growth. Any time when mathematics teachers can get together to talk about mathematics and teaching is a golden opportunity.

Support. I need support. I need support from my department, parents, staff, administration, my district, the ministry, and society as a whole. Can you imagine the reaction if a parent said, "It's okay that Tommy can't read, I couldn't either?" It cannot be acceptable for the mindset to continue that it's okay to be "bad" at math. I need

parents, and society as a whole, to support that math can be exciting and fun and doable. I need (and have) support from my department and administration in how I choose to teach my students.

Time. Time is a huge factor. I need time to plan lessons, attend conferences, talk to other teachers, to think and to work. My school has released me to go to this conference, but I teach four blocks a day and have only my lunch break to try to do the myriad of tasks that need doing (photocopying, filling out forms, calling parents).

Curriculum. We need a curriculum that is stable, consistent, and balanced. Change is good, except when it is change for the sake of change – which seems to be what our ministry does every five to ten years. Not only that, but often we are behind the times. The new textbooks that have come out for the grade 8 curriculum are almost purely constructivist and contain very little practice material. They also include a lot of reading at a level that is difficult for many of our students.

What I write now

Reflections after the conference

I don't have too much to add or change from what I said before. I still believe that we need a more stable and balanced curriculum. Change for the sake of change is not useful and is costly (in terms of time and money). Support is still a large issue – teachers of mathematics need communities to support the fact that mathematics is important and that it is not socially acceptable to be “bad at math”. I believe opportunities for growth are important and I also believe that they exist. CMEF is an example of that. I had the opportunity to meet experienced teachers who had a wealth of information to share, and were willing to do so.

Listening to other members on the panel I would add that technology is important and relevant to our teaching. Not only using SMART boards or tablet PC's but also teaching our students how to use technology wisely and making appropriate use of the technology they use on a daily basis. Rather than banning the use of these devices, how can we encourage and educate them to use them in an useful fashion to benefit and enhance their learning? Therefore I need access to and training in how to use certain technologies.

Attending CMEF and being a panelist was a great experience for me and I value the people I met and the knowledge I gained as a result of the panel discussion and the workshop sessions.

**Shannon Sookochoff, Victoria School
Edmonton Public Schools (Edmonton, AB)**

What I wrote then

What do I need now?

I have interpreted “what do I need?” in two ways. One, what do I already have in place that I find to be crucial in order to do the work I do? And second, what do I need in order to continue to grow and feel hopeful about math education?

What do I already have in place?

So, on the matter of what I already have in place and that I would recommend to any growing teacher...

I need meaningful experiences with collaborative structures. For example, my mentor and dear friend, Tom Kieren is largely responsible for building a community of academic collaboration for mathematics education at the University of Alberta. There, even after his retirement, research is a team endeavour, ideas are manipulatives, and papers are coauthored.

Additionally, the Canadian Math Education Study Group annual meeting arranges people into working groups to build knowing collaboratively. From that model, came the structure of this forum, Canadian Math Education Forum, where we are meeting to harvest what we already know, to assume that the whole is greater than the sum of its parts, and to celebrate a discipline that we love.

So, I continue to need these and other significant experiences with social constructivist models for learning. Such experiences have emphasized for me that mathematics is dynamic and interactive. I am suggesting that we offer explicit programs to help build teachers’ embodied knowing of what it means to learn in community.

I need my mentor network. This is the most important factor in my success as a teacher. I need, I really need, my internet network of mentors and math friends. Over the years, when I wondered about a linear algebra approach to deriving the general term for the Fibonacci sequence, I had conversations with Peter Taylor, who knew it was important not to give me the answer. When I needed to think about how to engage students and harness their ability to notice, I asked John Mason at the Open University. When I wanted to know why workbooks don’t work, I ask Ralph Mason in Winnipeg. For proof, I ask David Reid. And for everything else, I talk to Elaine Simmt, my friend and fellow fractal watcher.

I am suggesting that we deliberately building mentor networks and on-line professional learning communities. If I could name one thing that I could not teach without, it would be my network of excellent teachers.

Now for the things I need but do not have.

I need a critical assessment of provincial standardized testing. When I want my students to feel mathematically empowered and to engage in their own thinking, their peers' thinking, and in the legacy of mathematical ideas before them, I must embed those values into the structure of their classroom experience. And I must model my own mathematical powers and wonderings. If my administrator wants a staff of mathematics teachers who engage students on a deep level, respecting their differences, encouraging conversations and risk, then that administrator must model those values in his or her interactions with staff. Likewise a district must articulate and model respect for deep mathematical understanding and collaboration. And so on toward larger and larger frames within our education fractal.

So, when I notice that my ministry of education continues to punctuate the work of teachers and students with a high stakes multiple choice exam containing questions that are often void of context, I am faced with a serious cognitive and fractal disconnect. From my observation, our Alberta Diploma Exams dictate much of the math teaching in Alberta high schools. Our unit tests, our midterms, and our finals in grades 10, 11, and 12 are most often miniature diplomas. Many teachers are focused on preparing students for tests. I'm not. But it takes a lot of courage to resist the trend. How, then, can we expect more teachers to jump on the constructivist band wagon (okay, it's more of skateboard) when we measure success with a largely multiple choice high stakes exam? How can we expect more teachers to sing the praises of inquiry when their PD days often include one page handouts (the equivalent of a formula sheet) about brain research or differentiated instruction or some other one-size fits all teacher-fixing device? My ministry and district need to realize that the medium **is** the message. If we want a constructivist and inquiry-based program, we need to assess every level of our bureaucracy (including but not limited to our provincial testing) for its constructivist and inquiry-based features.

And, I need a unified national mission statement and supporting initiatives. I have spoken about the fractal integrity of our mathematics education. I also need integrity of a more concrete kind. I need to be able to succinctly articulate what I value and what authorities on mathematics education value regarding math teaching and learning. I need an administrator who can do the same. So, I need a website dedicated to communicating a description of what we want to see in our math classrooms and why. I need the website to speak to parents, students, teachers, tutors, supply teachers, administrators, and ministries. I need a section for tutors and substitutes, explaining how they might use research based approaches in their interactions with my students. I need internet examples of progressive algorithms (like grid multiplication), cognitively sound homework advice, vetted applets, and other supports so that parents who want to be helpful do not have to rely on their own instrumental experiences to help their children navigate a largely relational approach. This site would be a good place for video recordings of model lessons, which I can't get enough of and which I have found to be the best conversation starter for teachers who are stuck.

I'm saying that I need clarity on what we mean when we say reform teaching, inquiry-based learning, and a constructivist curriculum. Supporting initiatives

might include an accreditation process for teachers (currently in place in Saskatchewan) and annual CMS awards to teams or individuals exhibiting the qualities that are in harmony with our mission statement.

I need more examples of good teaching. I recently read Jo Boaler's and Cathy Humphreys' book *Connecting Mathematical Ideas*. It is outstanding. I learned something useful on every page. But more importantly, I was able to stimulate conversations with other teachers with the DVD that comes with it. I need more transcripts and video samples of good teaching.

What did I need then?

I needed a math education program that included:

- A cooperating teacher who was inspiring.
- Texts like the Boaler and Humphreys book and DVD.
- Collections of teaching and learning resources from which I could pick and choose what is best for my students.
- A rigorous set of psychology courses on cognition and brain research.
- Math courses taught by exemplary teachers.
- Math courses integrated with math education courses.
- Math courses that emphasize connections between ideas ("units" of study). One of my students said that he liked "a project that opens up new questions. [It] really helps when [ideas] are connected. If there were to be a table and all the math were on the table, there would be a little light here and there, but it would be all connected – [sometimes in other classes] you don't see that it is one big picture put together."
- And lastly, I needed a teacher preparation program with opportunities to ask why we teach math in school...who are we serving...what do we want for our students and our society through mathematics.

What I write now

What I wrote then and what I write now (or Here's what I'd do if I ran the zoo)

On May 30, 2009, I had the privilege of speaking to a group of math educators at the Canadian Mathematics Education Forum. Four teachers and I were asked to muse on what we needed.

Here I am, five weeks later and asked to revisit the musing above. And I must first say that the task of selecting words that might actually count for something in the national context of math education was powerful. My heart still beats fast at the thought. I had to determine which of my experiences were essential. I had to think hard about what essential meant: necessary; representative of a central idea; an essence. I had to imagine without restriction and trust that the musings of the one might resonate with the many.

And as I write, I see the task as quite mathematical. What features of a specific example are true for all? What is the relationship between specializing and generalizing? How does a shift of domain, or a rejection of restrictions, extend possibilities?

Since the forum, I have taken my actions and words more seriously. I feel a responsibility to act on my utterances. I have been more attentive to the details of my teaching. I have written to Alberta's minister of education. I have been better able to weather the storms that we trailblazers face. I feel as though I have been charged with something sacred. And, I feel so connected to a national spirit and strength.

A new friend of mine, someone highly skilled in facilitating collaboration and inspiring courage, has pointed me toward the writing of Margaret Wheatley (<http://www.margaretwheatley.com/articles/supportingpioneerleaders.html>):

- Pioneering leaders act in isolation, unaware that they are part of a broader community. They act on intuition and experience, struggling to not revert to the practices of the past. They feel alone and strange, often criticized, even ridiculed, by their community. They bear such labels as idealists, dreamers, innocents, for believing that they can lead in new ways, solve entrenched problems, and create sustainable progress.
- All this changes when they learn that they are part of a community, that there are many more like them. They gain confidence and courage. They find new energy to stay in the challenges and struggles of pioneering the new.
- The community they belong to is a community of practice, not of place. The community forms among people acting from the same values and visions. Their practices are varied and unique, but each practice develops from a shared set of values. In this way, the community is very diverse in its expression, and very united in its purpose.

I am hopeful and excited to see where we are ten years from now.

**Ann Arden, Osgoode Township High School
Ottawa Carleton District School Board (Ottawa, ON)**

What I wrote then

What do I need now?

Opportunities to expand relationships with and beyond teachers in my school.

- at the beginning of my teaching career I was very fortunate to have a series of wonderful associate teachers through the placements during my years in the concurrent education program at Queen's, as well as generous colleagues in my first few years teaching. Without these relationships and all of the mentoring and encouragement, I would certainly not have found this path.
- professional mathematics teacher groups (e.g. Ontario Association for Mathematics Education) offer a wonderful support and way to access new and "tried and true" resources; OAME puts on an annual conference as well as several regional mini-conferences each year
- active membership in these groups allows for real engagement with a community of keen teachers and for identity building as a leader (even on a small scale within a school or district) in mathematics education; at the beginning of my teaching career

I was awed by many of the teachers presenting and wanted to be one of these wonderful teachers!

- some provincial Ministry of Education initiatives have encouraged and allowed the expansion of relationships with grade 7 & 8 teachers which has helped me gain a better understanding of the experiences of my grade 9 students, as well as encourage each other in the our learning of using manipulatives and technology to improve learning . I have also been inspired by the cross-curricular way that many of my elementary school colleagues (Bridging the Gap, GAINS, TLLP)
- I have had the opportunity to participate in another Ministry funded project in which 5 teachers worked together in a lesson study examining the mathematical processes (problem solving, reasoning & proving, connecting, etc.) in grades 7-10 classes. This involved co-planning and observing lessons for all 5 teachers. The intense nature of the project has been a wonderful step towards deprivatizing practice with the opportunities to observe learning in other classrooms.
- I am currently working on a M.A. in Education at the University of Ottawa and have been very fortunate to work with Dr. Chris Suurtamm and a wonderful group of researchers and graduate students. The Mathematics Education Research Unit (MERU) puts on many activities for researchers, graduate students and teachers including reading groups, symposia and inviting guests to present their research and thinking. The course work, generous opportunities to work on several projects as a research assistant, and my own thesis project have been wonderful opportunities to think about teaching from a new perspective.
- I was able to attend CMESG last year and really enjoyed the working group, and appreciated how welcome I felt as a teacher.

Opportunities to break out of my traditional/conventional impressions beliefs/experiences about school.

- early in my teaching career I taught in many different departments and taught many different courses, which influenced the way, I view teaching mathematics. For example, I taught music for three semesters and found this experience really influenced my understanding of a ‘performance’ and use of observations in assessment. It was a very interesting experience to teach grade 9 math during period 1 and then walk down the hall to the music room for period 2 with several of the same students to the music room and think about assessment.
- my first years teaching were in an “inner city” school in downtown Ottawa with courses in a system class for students with learning disabilities so I took qualification courses and had access to professional development in the area of special education which was very important in building my beliefs about teaching and learning. I also taught many students who were new to Canada and learning English. Many of these students had lived through incredible upheaval and trauma and had experienced very little schooling. Many of these students’ experiences with education were very different from my own which was a great learning experience for me personally and as a teacher.
- In my undergraduate course work I was able to take Peter Taylor’s math & poetry course at Queen’s which was my very first experience looking at school mathematics in a different way! The focus on problem solving and sharing thinking about problems was very unlike my own experiences with school

mathematics which inspired me to keep thinking about mathematics in this way, as well as searching for wonderfully rich problems, as well as allowing the time for discussion and sharing in my own classes.

- It is in this area that I would still love more examples of rich/open/authentic problems.
- Additionally, I would resources connecting to real applications (at college and university level). Since I have not attended college myself, I do not feel as prepared as I would like for preparing students for college programs and apprenticeships. Ontario streams courses in grades 9 and 10 into applied and academic streams, and I would love the opportunity to think more deeply about the applied math curriculum.
- Being an associate teacher working with teacher candidates was at first a very surprising learning experience for me. I have found that this experiences, as difficult as it can be to “give up” my classes really fosters reflection about my own practice and instincts. I remember one specific experience with a teacher candidate that made me re-think the way I used a course textbook as a resource for learning, as well as planning my own questions.

Continued opportunities to learn.

- pedagogy, content, pedagogical content knowledge, etc. I would love the chance to think about the school mathematics that I teach more deeply. I can certainly say that I still find myself making new connections within the actual mathematics each time I teach a course, and particularly when curriculum changes and topics are sequenced differently. Much of the PD that I have attended focuses on a resource or strategy, but often avoids the actual mathematics itself.
- I cannot overstate how important mentorship was for me in my early years teaching. I was assigned formal mentor as part of a board induction program, but informal mentorship had a much greater impact – conversations in the department office and staff room, collegial sharing of resources, tools & strategies. These early discussions are critical in identity formation and it is so important to be around positive and excited people.
- Our province & board had many more learning opportunities in math than in science, which was a major reason for me to position myself to teach mathematics over science, despite my undergraduate major in chemistry. Our board currently has several math specific consultants, funds district assessment and learning projects, and the Ontario curriculum has undergone several recent revisions, which have encouraged learning with manipulative and new technologies, which make it exciting to teach math. In our board English & math heads get release time for 5 meetings per year (during the school day) while other subjects tend to meet once or twice a year, and often outside the school day.
- curriculum in Ontario has been revised twice recently (1999 and 2005) which has caused wonderful upheaval and rethinking the province wide curriculum is a great place to give key messages
- leadership opportunities for experienced teachers funded by the Ontario Ministry of Education through the Teacher Leadership and Learning Program.

- I need learning opportunities sponsored by a variety of voices – often school boards and commercial interests – at the University of Ottawa several professors have initiated the Mathematics Education Research Unit which conducts activities that include grad students and teachers – I also went to CMESG last year which was wonderful
- learning about technology – moving from static to more interactive – moving from stereotypical rigid lesson plans to lessons with pivot points – ideas emerging from collision of ideas
- video data from classrooms to discuss with colleagues (e.g. TIMSS Video Study)
- still need: efforts made to avoid exclusive top-down dissemination of research & resources to Principals/dept head/leads (become gatekeepers)
- course connecting school mathematics and learning theories

Support and encouragement to take risks and change/develop/improve my practice.

- support from Principal & dept head to “try things out”, and be away from school to attend conferences and PD opportunities
- encouragement from central staff to participate and help plan teacher learning and resource development
- currently involved in extensive Teacher Leadership and Learning Project – a PD project funded by the Ministry of Education

What I write now

What did I need then?

To build relationships with colleagues. Building relationships with my colleagues at a local level was very important during my first few years teaching, and still is. An important part of this process was the informal “prep room” talk in department offices where ideas and strategies were often discussed and attitudes and beliefs frequently shared. I needed to be around a group of people that would care for me and value my efforts and contributions. These discussions are a critical aspect of teachers’ identity formation, especially for new teachers, and I have been fortunate that the vast majority of teachers that I have worked with have been positive people who are excited about and committed to what they do each day.

In my first few years I had many professional development opportunities due to the substantial secondary school curriculum revision in Ontario in 1999. The best of these experiences offered by my board involved time for collaboration and discussion with fellow teachers. The annual conferences of the Ontario Association for Mathematics Education (OAME) opened my eyes to what was “possible” with a wealth of sessions on classroom strategies, tools, tasks and assessments given by inspiring teachers. I left these experiences feeling motivated to increase my participation in my school board’s math community and learn about ways to connect with the provincial mathematics education group.

During this period of curriculum revision, many of the veteran teachers looked to young teachers to get a sense of what the new curriculum was, how it was different from the previous curriculum and how it was “supposed” to be done. Since I taught courses in several departments, including six different departments in my first year, I had the chance

to listen to and later participate in many of the discussions within our school regarding the curriculum reform. Being part of so many conversations helped my own thinking about the curriculum revisions and led to a confidence in contributing my own views and interpretations. I felt very encouraged by the responses of my colleagues, especially when one teacher asked me for a copy of some materials I had created.

My experience with formal mentorship was well intentioned but less valuable. I was assigned an official mentor at my school through our Board's induction program who was a well respected and friendly veteran teacher. We attended a formal three-session program together and he checked in on me periodically during my first year. Since we did not share an office or any courses, the relationship was not as rich as it could have been if we had had more in common. Most of my department heads were responsible for several departments and taught in different areas to me (e.g. the science head was a physical education teacher, the math head taught cooperative education), so I did not connect with any of these department heads in a mentorship capacity. I am not sure how these experiences with formal mentorship could have been improved, but I think that the lack of a primary mentor caused me to actively seek out several colleagues for advice, which resulted in a variety of perspectives to consider.

To build relationships with students. As important as it is to be a part of the teaching community, we spend the vast majority of our time as teachers with our students. I needed (and still need) to build rapport with my classes and professional relationships with individual students, both in and out of the classroom. I believe that so much of our effectiveness as teachers comes from these relationships and in order for students to learn well they need to feel welcome and safe at school, be engaged in the lessons and activities, and develop trust in both their teachers and their peers in order to allow them to take necessary risks. It is important to laugh and share stories, to talk about current events in the classroom, and to participate in extracurricular activities with students.

To develop an awareness of a variety of resources and tools. In my first few years teaching, what I desperately searched for were quality instructional tasks, pre-made activities using graphing calculators and software programs, sources for rich problems, assessment tools and strategies, and course plans from veteran teachers. While I did try to plan a week in advance, my focus was primarily on "right now". The Ontario Ministry of Education approved several textbooks for most math courses, and funded the development of other reform-oriented resources, including exemplars for tasks at each grade level, so there were plenty of materials to choose from. While awareness of this wealth of resources was important I also needed a guide to help me select and sequence the materials, to help with issues around timing of topics and activities, and to ensure I "covered" the curriculum. In these early years I perceived course textbooks to be excellent illustrations of the curriculum, and tended to rely on them, rather than the primary curriculum documents, to help me plan my courses. The textbooks released during this period frequently came with a CD ROM of assessment material, and I quickly fell for the cut-and-paste tests, rather than designing my own (as I do now) to ensure greater coherence between instruction and assessment.

In addition to new resources, there was also substantial funding for new manipulatives and technology. This included money for the purchase of items such as class sets of algebra tiles, linking cubes, and graphing calculators, and provincial software licenses for many programs including the Geometer's Sketchpad and Fathom. My understanding is

that this sort of investment at the provincial or state level is a relatively rare phenomenon, but it allowed the Ministry of Education to make references within the curriculum to dynamic geometry and statistical software as tools to be used to investigate mathematics, and gave teachers easy access to these valuable tools.

Time. As a new teacher I really needed more time to consider what I was doing in the classroom. As I previously stated, I taught courses in six different departments in my first year teaching which meant searching for materials in many parts of the school building and constantly preparing new lessons and activities. Many of my colleagues had a “survival of the fittest” mentality about new teachers: “if I did it so will you”. There did not appear to be much consideration for new teachers’ timetables, rather we were mainly used to fill holes in the timetable. While I do now view this experience of teaching many different courses and subjects as incredibly valuable to who I have become, I think that learning to teach is so difficult that special efforts should be made, where possible, to try to reduce the number of different courses a teacher has in the first two years when all of the “preps” are new. Even repeating one course in a year would be a helpful start to refining materials, strategies and tools, rather than constantly scrambling through new courses. If money was no object, an ideal induction to teaching would allow full time pay for a reduced timetable in a teacher’s first semester (e.g. full time pay for teaching two courses at day rather than three).

What do I need now?

*Opportunities for “sustained mutual engagement.”*¹ While inherently social in nature, teaching can often feel very isolated. Projects that offer teachers opportunities to talk to each other and discuss their practice are very important to counteracting this experience and to helping negotiate a sense of what current reforms could/should look like in practice. I have recently had several opportunities to participate in projects that have occurred over a longer time period ranging from several months to several years. These have included Ministry and school board initiatives to work on implementing reform-oriented resources, issues in classroom assessment, and transitions from elementary to high school. The shared experiences have been extremely valuable to me individually, as well as important for building community.

One particularly interesting project was a lesson study that I participated in with four colleagues. We met quite frequently over a period of several months to explore ideas and collaborate in lesson planning, and then observed lessons in everyone’s classroom. We found that we gradually became more comfortable in speaking openly and honestly about some of the “bumpy” areas of our practice. This was largely due to the observation component where we took risks and “laid bare” a slice of our practice to each other. The post-observation discussions became a space where we shared constructive feedback, posed questions and challenged each other’s thinking in a very collegial manner that is quite different to any other professional conversations that I have experienced. I was surprised at how valuable it was to see how other teachers managed things like storage,

¹ Wenger, E. (1998). *Communities of practice: Learning, meaning & identity*. Cambridge: Cambridge University Press, p.114.

materials, transitions, groupings, discussions and reporting. This project has made me reflect on the importance of working at deprivatizing our teaching practice. Outside of student teachers that I have worked with, I have only been observed on four other occasions in my nine years of teaching – three single-class performance evaluations by administrators and once by a board consultant who asked to visit.

I would like to have more opportunities to see other teachers in their practice, whether this be through video (such as lessons from the TIMSS video study), or through another lesson study, possibly beyond my own school department. It would also be interesting to be part of a group that video-recorded our lessons and then got together to share and discuss them.

While I believe that involvement in sustained projects is very important and can significantly alter the trajectory of a teacher's participation, teachers must also have opportunities to attend shorter workshops or sessions, sponsored by a variety of stakeholders, to raise awareness about issues in mathematics education.

Opportunities to participate in communities beyond my school and board. Becoming a graduate student and working with Dr. Chris Suurtamm and an active group of researchers and other graduate students at the University of Ottawa has been an invaluable experience for me. The course work, generous opportunities to work on several faculty research projects, and my own thesis work have been rich opportunities to think about teaching from a new perspective and to learn/experience educational research. The Mathematics Education Research Unit (MERU) at the University puts on many activities for researchers, students and teachers including reading groups, symposia and inviting external guests to present their research and share their thinking.

My experiences at the 2008 annual meeting of the Canadian Mathematics Education Study Group (CMESG) and this 2009 Canadian Mathematics Education Forum have been rich opportunities to make new connections and I have felt very welcomed as a teacher. The working group model for both conferences is valuable since it allows for a deeper exploration of ideas and a different sort of participation than is usually possible in shorter sessions. The format of plenary talks followed later by structured responses to these sessions allows for a vigorous negotiation of ideas. Hearing the sorts of questions being asked by those who devote their lives to this research has given me greater confidence in raising issues in my own local context.

To be challenged about my impressions/beliefs/experiences of/about school and mathematics. I would love the chance to think about the school mathematics that I teach more deeply. I do not struggle very often with the content that I teach, but I still find myself making significant new connections within the actual mathematics each time I teach a course, and particularly when the curriculum changes and topics are sequenced differently. Most of the PD that I have experienced has focused on resources or strategies, but almost always avoids the actual mathematics itself. I would like an opportunity to actually work on challenging school mathematics problems to further develop my own understandings and increase my repertoire of problems to offer my students.

While I am qualified to teach senior high school mathematics, my undergraduate degree is actually in chemistry, although I do have the equivalent of a minor in mathematics. Now that I have been teaching math exclusively for the past five years I would love the opportunity to revisit and possibly take some further university

mathematics courses. My foundations and motivation are so much stronger now than they were 15 years ago that I would experience these courses now with new ears and intentions. Efforts to invite teachers to audit undergraduate courses in mathematics would be an excellent way to build bridges between high school teachers and the university mathematics community, particularly if it was possible to apply for a small bursary to cover the tuition.

Many of the ideas put forth in the current reforms are outside my own experiences as a student and I need resources and opportunities to engage with what this looks like in practice. I need access to quality tasks for my students that are rich and open and that can serve as exemplars for me in my own task development. One important experience for me was the math and poetry course taught by Dr. Peter Taylor along with Dr. Maggie Berg at Queen's in 1998. I found the problems we worked on were incredibly engaging and thought provoking, and were very different than any problems that I had encountered elsewhere. While the class was much larger than any high school class would be, there was still a strong focus on group discussion of problems and sharing thinking within whole class discussions which I have carried with me as a rare experience/image of what is "possible" for school mathematics.

Some of the experiences that I have had teaching courses outside of mathematics have also significantly influenced the way that I think about teaching and learning. I spent three semesters teaching high school music, which challenged my ideas about assessment and made me think about the nature of performance in different subject areas. One year I taught grade 9 science and music in the morning and had several students in both classes. I was profoundly affected when one young woman told me that I seemed like a different person teaching the two courses. She pointed out that the students spent more time "doing" in the music class than in science and that I spent more time observing than "teaching" in music. Ever since, I have been trying to figure out what "doing" school mathematics is and how I can make sure that it happens more frequently.

I also need more examples of "applied" mathematics problems to help me understand how to better prepare and meet the needs of students who will be attending college or going straight to the workplace after high school since these pathways and experiences are unfamiliar to me and most high school teachers.

Support and encouragement from my various communities to take risks and continually renegotiate my practice. Finally, I need acknowledgement from my various communities that enacting practice aligned with current reforms is not easy. Within my local context I need the support of my school administration to try new things and be away from school to attend conferences and PD opportunities, encouragement and invitation from central school board staff to participate in learning projects and conversations to make sense of curriculum changes and current reforms, and I need the teachers at my school to also be willing to take risks and engage in critical conversations about what it is that we do on a daily basis. Beyond my local context I need to feel that teachers are welcomed, valued and listened to within the mathematics education research community yet challenged to learn more, and supported in inquiry into our practice. I have certainly had this experience at CMEF 2009 and look forward to further meetings and conversations within this community.

A number of recurring themes (e.g., technology, curriculum, resources, mentors, professional development) are evident in the panelists' writings above. However, and taking liberties with my reading of the panelists' reports, the overarching theme amongst their writings is a *call for collegiality* (read: involving shared responsibility amongst a group of colleagues). Alternatively stated in terms of the *Theme of the 2009 Forum*, the overarching theme amongst the panelists' writings is a call for "...the participation and collaboration of people involved at the many relevant constituencies: the school systems, teachers at all levels, coordinators, school boards, colleges and universities, mathematics and statistics departments, faculties of education, Ministries of Education, parent groups and business and industry" (<http://www.cms.math.ca/Events/CMEF2009/>). Should you disagree with my above assessment, I look forward to discussing this with you at CMEF 2013...Dear colleague.