



Enhancing professional teaching practices

Dr Alain Breuleux leads a project that seeks to promote the professional development of teachers through a range of digital tools and analytical processes. He discusses the challenges faced with engaging teachers in professional learning communities and his efforts to overcome these barriers

How did you come to recognise a need for improved professional development of teachers, and why did you see technology as being an important aspect of this?

The priorities of these issues are reflected in the order in which you ask this question, with professional development being the most important and complex, and technology being somewhat subordinated as a tool. However, it's actually through my participation in educational technology projects – in particular Canada's SchoolNet and its predecessors – that I developed a sensitivity to the importance of

teacher professional development. As a cognitive psychologist, I've been interested in using the computer as a tool to develop psychologically valid models of cognitive processes such as problem solving. I then became interested in educational uses of computers and, in particular, as the World Wide Web became available, in how this democratic and collaborative tool could be used in classrooms. Sustainable, collaborative professional development by teachers is the most promising way of achieving this goal.

What have been some of the factors that have influenced your work on development?

The educational research literature is very clear on the importance of teacher professional development as an important contributor to the quality of student learning. Among others, I have been influenced by the work of Ann Lieberman, Marilyn Cochran-Smith and Judith Warren Little. But I have also realised this need through coincidental encounters early in my career, with colleagues from both my research and the teaching milieu.

Have you encountered any difficulties with getting teachers to engage in professional learning communities (PLCs) or communities of practice (CoPs)?

PLCs and CoPs are informal, almost organic, entities that are not really designed or developed by an organiser; they evolve through participants' voluntary engagement. So, once we have decided to go in the direction of a PLC, our challenge is to create the conditions that enable participation.

To encourage teachers to engage in a PLC, it's crucial to build trust and create a safe and respectful atmosphere. Teachers should feel comfortable in sharing their own private teaching practice in classrooms with other colleagues and to ask for – and receive – others' feedback. Hence, we have paid attention to building social

The power of research-practice partnerships and digital tools for successful pedagogy

Researchers from **McGill University**, Canada, have established the Creating, Collaborating and Computing in Mathematics Project, a collaborative research endeavour that aims to help a network of teachers to develop and investigate digital literacy and mathematics learning. By identifying appropriate learning experiences, the most relevant methods can be encouraged

DIGITAL LITERACY IS a term referring to the knowledge, skills and behaviours that can be used in conjunction with a range of digital devices. As technological developments continue to lead to improvements in devices such as smartphones, tablets, laptops and computers, more and more questions are being asked about the role such equipment can play in specific environments.

With children today growing up in an increasingly digital world, it is important to consider how best to use digital technologies to facilitate learning within the classroom. Moreover, given their abundance, it is necessary to identify the digital tools best suited to achieving specific tasks and how best to integrate them in a way that is appropriate for teachers and students alike.

FACILITATING SUCCESSFUL TRANSITION
With that in mind, researchers from McGill

University have established the Creating, Collaborating and Computing in Mathematics (CCC-M) Project. Led by Dr Alain Breuleux, the research-practice partnership, with the Riverside school board, seeks to foster a sustainable professional learning culture through which teachers can develop pedagogically appropriate uses of digital tools.

The CCC-M team decided to focus on the teaching and learning of mathematics after discussion with the specific school board partners, who identified that student success in mathematics, particularly during the transition between elementary and secondary school, was a strategically important issue for them. "We worked on defining the scope of the challenge and membership in the professional learning communities (PLCs)," explains Breuleux. "As a result of this negotiation, the R&D between all stakeholders becomes a shared responsibility."

THE CAREFUL BALANCING OF PARTICIPATION

Importantly, when CCC-M was initiated, the school board provided clear data-based evidence about the problems of student success in mathematics. In presenting this data to the teachers from the outset, the PLC was imbued with a sense of there being an urgent need to act. Thus, a culture of working together to provide solutions to improve digital literacy and the teaching of mathematics was established from the outset.

A process of continuous reviewing runs alongside the Project to identify what is working, what is not and what can be done to iron out any issues there might be. Teachers naturally have a busy schedule, so securing their willingness to participate wholeheartedly is challenging, but necessary for the project's success. "The teachers asked for more structured guidelines indicating specific

relationships along with the gradual integration of different themes and their corresponding activities, which offers them positive learning experiences in appreciating the value of engagement in PLCs.

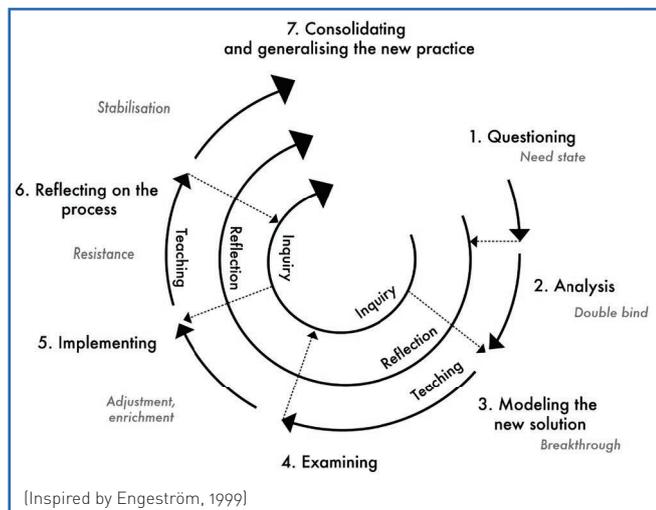
Do you have aims to roll out your PLC to teachers beyond your research programme, or to teachers of different subjects?

Yes, we definitely see opportunities for this PLC to grow further and be scaled up. Because this research-practice partnership is based on strategically meaningful objectives for both the school board and Faculty, we anticipate creating a board-wide culture of professional development through PLCs that can also connect with the R&D objectives of the Faculty. We anticipate extending the PLC

to more teachers in the school board, both in mathematics and in other subjects such as science and literacy, and are also looking to open other related PLCs.

Where do you foresee your research heading in the next five years?

I want to further develop our PLC's capacity to engage in collective reflection, supported by rich data from authentic classrooms in some form of video-based learning study group. In addition, I would like to develop a framework to facilitate the collective reflection, both in face-to-face meetings and online within similar PLCs



expectations for participation,” explains Breuleux. “We realised that it is important to keep a balance in their engagements between voluntary and compulsory components.” With that in mind, the entire PLC has developed a group consensus on shared goals in relation to participation.

A NECESSARY STEP FORWARD

The Project demonstrates how research-practice partnerships and professional learning communities can facilitate shifts in teaching practices toward high-leverage pedagogy and the integration of digital tools. To sustain

this significant step forward in professional development, it is imperative that a process of reflection, inquiry and knowledge sharing is upheld.



PARTNERSHIP FOR REFLECTIVE AND COLLABORATIVE TEACHING, INQUIRY AND SUPPORT (PRACTIS)

OBJECTIVE

To develop inquiry driven, technology enhanced, sustainable professional learning environments for the advancement of teaching, learning and digital literacy.

KEY COLLABORATORS

Riverside school board, Québec, Canada

Centre de recherche intervention sur la réussite éducative et scolaire (CRIRES), Québec, Canada

FUNDING

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ALAIN BREULEUX has a PhD in Cognitive Psychology. He has worked at McGill University for the past 25 years, collaborating with school teachers and administrators

to co-design, foster and investigate sustainable technology enabled networks for learning and advanced pedagogical practices. He is also Associate Dean (Infrastructure) in the Faculty of Education, providing academic leadership for the (re)design of learning spaces.

METHODS OF MEASUREMENT

To measure both the positive and negative effects of the Project's professional learning community (PLC) on the teachers engaged with it, Dr Alain Breuleux identifies the precise ways in which the PLC evolves and facilitates a process of continuous improvement through refinement.

Some tools that have been used to chart the effects of the PLC include:

- Survey questionnaires
- Regular interviews with individual teachers
- Transcripts of Edmodo postings
- Video records of class activities
- Reflection on the class activities filmed
- Teachers' feedback after face-to-face meetings
- Video/audio records of group discussions at face-to-face meetings
- Video/audio records of leadership team meetings

