Interactive symposium

Bruno Lemieux, *CL-inspired formative intervention (FAST project) as a way to transform a learning environment*

In a « Change Laboratory-inspired intervention », the participants are trying to develop their practice in a multidisciplinary working group, supported by researchers who help identify recurring tensions. The shared object is a new understanding and the construction of a new model to articulate conflicting requirements. (Engeström, 2001) In this poster, we present the “FAST” project (Development and evaluation of “alternance” training in science and technology for students with learning difficulties from underprivileged homes, 2011-14) in which CL-inspired formative intervention was used as a way to transform a learning environment, developing a new organisational model of “alternance” training aiming to increase students’ scholastic motivation and school success. Using two epistemological principles forming the basis of intervention in activity theory – i.e., double stimulation and the logic of ascending from the abstract to the concrete (Sannino, 2012), we documented inner contradictions and transitional actions and we present the expansive learning as cycles of learning actions.

Pascal Martineau, *Understanding the adoption of the iPad as a mediating tool for underprivileged high-school students*

This study focuses on the adoption of the iPad as a teaching and learning (mediating) tool within the context of a cooperative education program in two high school classrooms populated by underprivileged students. In the tradition of Activity Theory (Engeström, 1987), we examine the first attempts to integrate new tools on top of existing ones by modeling first level contradictions from the dual perspective of the preservice teacher and the internship mentor. Using the framework proposed by Sharples, Taylor and Vavoula (2005) to theorize about mobile learning, the interplay between the semiotic and technological layers of the tool-mediated activity is analyzed to understand further the role played by the meaning that students give to the iPad. As new possibilities of active learning emerge from the use of mobile technology, its potential is impeded by inherent tensions between the entertainment and pedagogical values of the iPad as it transits from an interactive learning tool to a disciplinary lever in the context of the classroom.

Chantal Trépanier, *Mobile technologies as new supports for cooperative education: Early stages (FAST project)*

Our working hypothesis is that mobile technologies could support cooperative education for secondary school students who show low motivation and interest in science. At first, we identified the uses made of the iPad in school and business by questioning students online and interviewing them. Second, we applied Engeström’s conceptual framework to analyze the iPad integration into the student’s dual learning activity system. Third, tensions identified led to a better understanding of participating students’ need state regarding the uses of the iPad during class time. Previously undisclosed educator-relevant information perked through, letting show unsuspected manifestations of engagement on their part (curiosity, concentration, discipline, reading, feeling of effectiveness), thus revealing their hunger to learn differently in the classroom.

Marie-Desneiges Hamel, *Student teachers’ agency in a virtual community serving the development of a one-to-one laptop program (PROTIC, secondary-school program)*

This research aims at the development of a 1:1 laptop program named PROTIC. From 1997 until now, the program has been deployed internally, and consolidated. Despite the reputation of their program, the teachers are not satisfied with the way they communicate the model, and want to further reflect collaboratively for a greater sophisticated language of practice. However, they note that people outside the program don’t understand exactly what is the PROTIC program. So they want to come across better. In alignment with this purpose, the following research question is being asked: How is it possible, within the conceptual and methodological framework of activity theory, to help PROTIC teachers progress
Towards their goal and, in doing so, foster the development of the innovative program in which they work? To meet the needs expressed by the teachers, a cultural-historical analysis of PROTIC will be conducted by investigating the online written discourse of past cohorts of preservice teachers (the virtual community) who did their student teaching in a PROTIC classroom and reflected collaboratively on classroom practice throughout their practica. The results will be presented to the teachers and will serve as a mirror likely to stimulate further collaborative reflection.

**Angela Perez, ACOLPROF: An emerging community of practice on teaching language in Columbia**

Responding to international policies and measures taken for 21st century education (UNESCO), the Colombian government has implemented (2005) two main projects: "Education for all" and "Bogota bilingual in 10 years". Their goals are far-reaching for public schools. We know pre-service and in-service teachers as well as mentors and/or supervisors and local policy makers that want to come to a shared vision of what teaching language is and how it is to be practiced within a 21st century framework. Our research will unfold by applying a Change Laboratory approach to 1) identify participants' tensions and conflicts within their respective activity systems, and 2) present the community of practice (CoP) model as a second stimulus, one built on a conception of the teaching practice that could serve as artifact to develop a reflective collaborative practice (an expansive learning process) in place of the object of the system of activity in which all participants are engaged. Our main research goal is to understand the conditions under which the individual motives of the different members of the CoP who share a similar concern, may converge or not.

**Mathieu Lacasse, Need state, tensions and modeling practice rooted in a socially environmental controversial issue**

Since 2006, Quebec grade 10 teachers in science and technology have been encouraged to address environmental issues in order to promote learning concepts prescribed. Our work aims to highlight the challenges faced by two science teachers in Quebec when implementing such practices. From a theoretical point of view, recent studies in Cultural-Historical Activity Theory document how, in schools, educational efforts and organizational innovation have succeeded or failed. Engeström refers to an expansion cycle that leads to educational innovation in a given environment to document this change. He argues that the historical-cultural dimension is essential to understand the construction of meanings. This cycle provides an analytical framework for the renewal of a teaching practice and will be put to use in order to 1) document with teachers prepared to treat the environment, the early stages of Engeström’s expansion cycle and to 2) identify the tensions that motivate or brake them.

**Julie Massé-Morneau, Manifestations of contradictions in secondary school students' reading intentions and volition (Environmental science ed project)**

According to the PISA results published in 2009, one out of ten Quebec students does not demonstrate the necessary basic reading skills (MELS, 2010). Reading difficulties impinge upon the abilities required to gain learning autonomy, for instance, in Science and Technology. This research will explore the strategies that students use when they read a scientific text for the first time during class. To document student agency (the intention and the volition) in an assigned reading task in science, we plan to use the principle of double stimulation. We would then analyze students’ interviews with an aim to identify the need state according to the discursive manifestations of contradictions and we would model them in an activity system.

**Émilie Labonté-Hubert, Manifestations of transformation through the integration of ICT tools (Knowledge Forum and VIA) in Burkina Faso’s plethoric classrooms (@CTIF project)**

This study focuses on the integration of ICT (@CTIF project), specifically Knowledge Forum and VIA, in Burkina Faso’s overcrowded classrooms. As the use of these tools must begin with teachers’ pedagogical intentions, this master’s thesis focuses specifically on transformation manifestations, namely tensions, experienced and manifested by teachers regarding the pursuit of ICT integration. Applying the activity theory’s framework (Engeström, 1987), this research examines teachers’ activity, highlighting the complexity of integrating tools that come into tension with established practices and school context. The challenges emerging from our analyzes point to inherent tensions in overcrowded classrooms. Promising
transitional actions are also highlighted as we uncovered how tensions could be resolved to facilitate the integration of a knowledge building pedagogy in this context. Furthermore, this study suggests the application of the community of practice model to provide teachers an intellectual context favorable to proper ICT integration.

**Esther Saint-Pierre, Modeling the creative process for the solving of an esthetic problem addressed by an emergent knowledge building community (KBC)**

Research on innovation has recently broken the myth of individual genius: collaborative teams generate creative ideas. My project will take place in an elementary school classroom within which students will be prompted to engage collaboratively in an artistic “démarche”. A Knowledge Building pedagogy will be applied, and Knowledge Forum used. The interaction between students will be analyzed through double stimulation. The object of their activity will be constantly evolving, thus crystallizing the creative process in a material form. Knowledge Forum will act as a mediating tool in the interaction with sophisticated problems (first stimulus), and so will all artistic concepts mobilized and negotiated by the community members. Will they capture various tools, and use them as second stimuli? In which ways will the creation of artifacts reflect the activity of the emerging KBC? Will they be transmitted and disseminate as to become a frame of reference for the whole community?

**Marie-Caroline Vincent, Proposing a theoretical analysis tool for reading the development of complex mathematics skills in Quebec Science and technology classes**

In the optic to integrate different high school disciplines, we compare different Mathematic and Science and technology didactic perspectives. Using these didactic theories and their dialectic relations, we propose a way to connect teaching practices and students learning. Our analysis of Vergnaud’s Conceptual Fields Theory has allowed us to conceptualize an integration of the main elements of Engeström’s Activity Theory. Our research project’s methodology provides us the necessary tools to establish a link between a “novel” analytical framework to read educational practices. Finally, we define how we propose to use methodological tools in the school environment within which we will do research and intervene.