

# Online/onsite activity in elementary and secondary classrooms using advanced collaborative technologies

Fernand Gervais, Laval University, Québec, QC, Canada, fernand.gervais@fse.ulaval.ca  
Eugène Bordage, Laval University, Québec, QC, Canada, radon@sympatico.ca  
Thérèse Laferrière, Laval University, Québec, QC, Canada, tlaf@fse.ulaval.ca

**Abstract:** This research paper examines coconstruction of knowledge in three different school contexts. Systematic interaction analyses were conducted in over twenty elementary and secondary classrooms. An array of descriptive statistics was produced, including a number of significant differences. The verbal face-to-face context, in which no collaborative technologies were used, revealed to be the one where less coconstruction was observed. Coconstruction was often limited to the expression of opinions. Explanation was present but justification almost absent.

## Introduction

Contemporary perspectives focus a great deal on social interaction in the classroom (Sawyer, 2005). In our modern era, collaborative tools or technologies are bound to play a major role in supporting social interaction for learning and knowledge building purposes. A new approach regarding social interaction has to be built in the classroom when a teacher engages students in a hybrid mode of learning (onsite/online), one that provides direct and interactive access to information, and opportunities for cooperative/collaborative work in the classroom or between classrooms. The coconstruction of knowledge occurring in such a context is of a great interest (Bransford, Brown, and Cocking, 1999) from a research point of view. It becomes even more interesting when various forms of coconstruction can be compared as the teacher can provide a variety of situations, with or without advanced technologies. The goal here is to compare coconstruction in three different school contexts, including two that could not have existed without the use of collaborative tools, namely an electronic forum and a videoconferencing system.

## Conceptual framework

Vygotsky's social constructivist theory (1978), Brown's learning community concept (1997) and Scardamalia and Bereiter's knowledge building principles (2003) provided solid foundations for teachers interested in the classroom-based learning/knowledge community model as a way to enhance the learning environment they create for students. Social interaction for learning or knowledge building purposes are at the core of their views. Our main research assumption was that the interaction between the learner and knowledge, scaffolded by teachers or students, is the most critical one. Higher-thinking and social skills have been associated with advanced uses of collaborative technologies in the classroom. Recent studies include Lamon, Reeve, and Scardamalia (2001) and Hopson, Knezek, and Simms (2002). Cooperative and collaborative learning strategies can be applied to engage students in conversations with one another. What is learned is then not only about what students read but what is said to one another about what they read (Pence, 1993). Analyses of online conversations, using socio-cognitive discourse analysis methods, have contributed to the understanding of participation in classroom-based learning communities (Breuleux, Bracewell, & Renaud, 1995), and ways of fostering it. We asked ourselves the question: In which context is social interaction for learning purposes favored in most substantive ways?

## Methodology

Three distinct learning contexts were differentiated: 1) a face-to-face context in which the teacher was vocal about the learning community concept but was not using Internet-based collaborative technologies; 2) an hybrid context in which the teacher did not talk explicitly about the learning community concept but provided opportunities for students to use a videoconferencing system (iVisit) for collaborative activity, and 3) an hybrid context in which the teacher did not talk also explicitly about the learning community concept but provided opportunities for students to use an electronic forum, namely Knowledge Forum, for collaborative inquiry. Participants were from different elementary and secondary classrooms, urban and rural (Quebec, Canada). Over twenty classrooms participated in the study. Direct observation was made in context-one classrooms whereas context-two and context-three classrooms were observed through recorded videos or transcripts of the electronic forums. The procedure of data saturation was applied. Interactions were analyzed under three dimensions: linguistic (Searle's and Vanderveken's typology, 1985), sociocognitive (Brown's and Renshaw's collective line of arguments, 2000) and socioemotional (Bales' interaction analysis system, 1950). Descriptive statistics methods and qualitative analysis were applied.

## Results

Data analysis showed that coconstruction of knowledge was more evident in Knowledge Forum than in the two other contexts. This was observed, among others, by the presence of type-three sequences (collective knowledge), but especially by many type-two sequences (exchanged knowledge) where coconstruction, although less marked than in type-three sequences, was present. The verbal face-to-face context (context one) revealed to be the one in which less coconstruction was observed. This fact seems to be reflective of a high frequency of type-one sequences (transmission of information by the teacher). As for context two, in which iVisit was used, the results showed greater closeness to the verbal face-to-face context (context one) than to context three (the context where there was use of Knowledge Forum). All contexts considered, explanation was present (6,93%) but justification was almost absent (0,17%). Consensual elements accounted for 9,23% of all elements. Most units of analysis were codified as expression of an opinion or of an information followed by an individual agreement or an opinion accompanied by total or partial disagreement (expressed by yes, but...), and sometimes followed by an agreement.

## Discussion of results

In all three contexts coconstruction between teacher and students and student-student(s) remained negligible, although more explicit in context three (written interaction on Knowledge Forum). Wherever there was coconstruction it was often limited to the expression of opinions without much disagreement or negotiation of consensus. The justifications a disagreement should have brought were almost nonexistent in all three contexts. The formulated hypotheses that could have given rise to discussions were rare. Therefore, coconstruction revealed to be more a juxtaposition of elements than real coconstruction of knowledge. The results provided us with opportunities to raise a number of explanatory factors for such low-level forms of coconstruction: the nature of the activity, the factors that led one of the contexts to favor more coconstruction of knowledge, the absence of a socioconstructive culture in most classrooms observed, and temporal constraints. However, socioconstructivism remains a sensible approach, one that has the potential to take the learning environment out of its narrow corridors when it comes to the transmission of knowledge as pointed by an official Quebec Ministry of Education document. We saw instances of a rich learning context within which meaning was negotiated and ways of understanding emerged and evolved but they seemed to be too rare. This study demonstrates the importance of pedagogy over technology but also to advanced pedagogies supported by advanced collaborative technologies that support written classroom discourse. It also justifies the position that in a world where information is more and more abundant and accessible, coconstruction through platforms of discussion and exchanges in the classroom is unavoidable.

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