Chapter 28

The Polyphonic Model of Hybrid and Collaborative Learning

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ABSTRACT

This chapter presents a model for hybrid and collaborative learning based on an analogy with musical polyphony, starting from Bakhtin’s ideas of dialogism. The model considers different voices (participants) inter-animating and jointly constructing a coherent tune (a solution, in problem solving), enabling other voices to adopt differential positions and to identify dissonances (unsound approaches). This chapter introduces also software tools, which visualize the discussion threads in a chat and the influences that an utterance has on the subsequent ones. Such tools help both teachers and learners to evaluate and enhance the learning process. The model helps to understand how learners inter-animate when they participate to collaborative chats for problem solving or other learning activities, including Hybrid Learning.

INTRODUCTION

In recent years, collaborative tools on the web, like message forums, instant messengers (chats, for example, Yahoo messenger with two or more participants), wikis, blogs and folksonomies became very popular, adding a new dimension to the web and bringing a new generation, Web2.0. It is very important that this new generation appeared before the generation expected by many: the semantic web. This fact is very significant because it emphasizes also theoretical issues important for learning theory and practice: The socio-cultural paradigm (“knowledge is built socially”) of Web2.0 is now much more successful in the competition with the cognitive paradigm (“knowledge is acquired individually”), which fundamental the semantic web and Artificial Intelligence (AI).

These different two paradigms have direct correspondence also in the way we see and support learning with computers. Instead Computer-Based Learning or Intelligent Tutoring Systems (ITS), two leading paradigms of the last decades, we discuss now about Hybrid Learning and Computer-
Supported Collaborative Learning (CSCL, see also Koshmann, 1999). Moreover, even the appearance of the idea of Hybrid Learning may be explained also by the failure of the ideas that learning is only a knowledge transfer process that may be achieved individually, solely with the use of totally online learning. Meanwhile, the difficulties of achieving artificial intelligence in the strong sense (totally imitating humans) leave far away the ideal of totally replacing professors by artificially intelligent assistants (as, for example, ITS supporters hoped).

The analysis of the problems in achieving strong AI has an important significance for this chapter because it emphasizes the role and specific features of dialog. The famous Turing test of AI (Turing, 1950), which was not passed yet, is in fact verifying if a computer program may enter into a dialog with a human exactly like a human. The difficulty of developing computer programs that enter into a dialog with humans suggests us to leave humans to dialog themselves, inclusively for learning purposes. This chapter is focusing exactly on this kind of communication, and it has as a main goal to analyze what happens in human dialogs for learning and to see how dialog may be used by small groups of students for learning collaboratively in chat conversations.

The last years showed that the use of chat conversations in Computer-Supported Collaborative Learning proved to be an effective way of complementing traditional classroom teaching (Stahl, 2006), being well suited also for Hybrid Learning. The polyphony theory and the associated model of inter-animating voices are empowering the achievement of these aims, encompassing both written (be it in chat or in manuals or web documents) and spoken human language (e.g. in classroom learning). Consequently, even a theory of Hybrid Learning may be developed in this idea: The voices of professors enter in polyphony with those of the students both in classrooms and collaborating using online tools.

It is a consensus that CSCL belongs to a sociocultural approach, based on the ideas of Vygotsky (1978). However, these theories do not capture the peculiarities of the conversational, dialogical nature of collaboration in CSCL. Consequently, several researchers (Koshmann, 1999; Stahl, 2006; Trausan-Matu & all, 2006; Trausan-Matu & all, 2007b) proposed dialogism as a basic model of CSCL. Dialogism is Bakhtin’s theory that everything, spoken or written, is a dialog (1973, 1981). Starting from dialogism, more elaborated theories and models may be developed, based also on the polyphony idea introduced also by Bakhtin (1973).

In addition, software tools may be developed for supporting chat-based CSCL, starting from the polyphonic perspective (Trausan-Matu & all, 2006, Trausan-Matu & all, 2007a; Trausan-Matu & all, 2007b).

The goals of this chapter are to analyze the particularities of discourse in CSCL conversation chats, to propose a theory for the inter-animation processes that occur and to present some tools for supporting this kind of learning. The achievement of all these goals is based on a unitary conception on linguistic interaction based on dialogism and polyphony, in conjunction with a socio-cultural perspective on learning. Moreover, the polyphonic model may be considered also as encompassing Hybrid Learning in general, because the same ideas apply not only to online chat, but also, for example, to transcripts of spoken dialogs in classrooms.

For the illustration of theoretical ideas with examples, we will use chats from two series of experiments. A first series of chats is taken from Hybrid Learning sessions performed with computer-science students in the final year at the Politehnica University of Bucharest, at a Human-Computer Interaction course, as a part of the Romanian CNCSIS K-teams (http://www.k-teams.cs.pub.ro/) and EU-FP7 LTFLL (http://partners.ltfll-project.org/) projects. As homework to the collaborative interfaces class lecture, students
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