

Argumentative Interactions in Online Asynchronous Communication

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Abstract. Argumentative interactions in online asynchronous communication are seldom studied by using a qualitative approach as Grounded Theory Methods. The purpose of this paper is about a theory of argumentation based on analysis of teacher-student and learner-learner dialogues. By examining linguistic features of the threads related to the forum of two different academic courses, we consider the structural aspects of argumentative interactions as expressed in term of co-construction of Knowledge.

Keywords: computer supported collaborative learning, social and cognitive processes, communities of learners.

1 Introduction

Researches on development of learning processes and interactions are supported by innovative educational technologies that have caused important changes on the mission of higher educational institutions.

Contexts with the opportunities of networking and collaborating constitute the main features of a learner-centered framework. Inquiry and collaboration are key processes to build argumentative interactions.

This PhD project concerns the structural aspects of argumentative interaction with particular attention to a particular modality of asynchronous communication, forum discussion.

The issue of argumentation has an increasing interest in education, not only because it is an important competence that has to be learned, but also because argumentation can be foster learning in many domains: mathematics, science, history and literature.

The processes of argumentation allow students to emerge new understanding and creative restructuring of problem solving. The learner becomes a co-author in building Knowledge.

2 Research questions

The PhD research is framed by socio-constructivist learning theory. The following general research questions are addressed:

1. Can grounded methods research be useful to understand theory of argumentative interactions in a context of asynchronous communication?
2. How can collaborative learning situations support argumentation?
3. What are the contextual aspects affecting argumentation with a particular attention to the role of student, peer student and tutor.

The aim of PhD project is to understand the nature of interactions, with particular attention to dialogical aspects occurring during processes of elaboration and construction of knowledge in a collaborative environment supported by asynchronous communication.

3 Significant problems in the field of research

Computer Supported Collaborative Learning Environments (CSCLE) affect social and cognitive aspects of construction of knowledge.

Some researchers state that in the contexts that promote process of knowledge-building, explanation is the major constructive activity [1]. This process support collaborative learning in all kind of processes that appear connected with knowledge discourse with the aim to co-construct meaning.

As emerged from a certain number of studies, the learners, working in collaborative environments, are more engaged in argumentative interactions oriented to epistemic tasks as the solution of problem, meta-cognitive reflection and building of consensus [2].

But, the studies tackle the problem of argumentative interaction in learning collaborative environments in a limited way.

The indicators that examine the aspect of argumentative interactions are often focused on quantifying interactions at fine-grained level [3].

Other researches based on user approach, focusing on quantitative methodology for assessing the nature of argumentative interactions, concentrate only about one or two dimensions of collaboration tasks leaving aside a more global picture of complexity arising from the understanding of cognitive and social aspects that constitute argumentative interaction.

The balance of individual and collective contributions of learners is rarely considered in the researches on investigating the nature of the complementary aspect in the processes of building and sharing Knowledge.

A quantitative research approach doesn't give indications for understanding how the members of group can collaborate effectively. Ethnographic methods are more sensitive to approach quality of collaboration on the basis of qualitative analysis.

4 State of the art: outline of current knowledge of the problem

Muller and Perret-Clermot [2] state that argumentation is conceived as a particular type of communicative interaction. The action of assessing argumentative interactions in a collaborative learning environment means building of social consensus through negotiation and development of individual and collective level of collaboration.

Baker [4] defines argumentative interactions as contexts in which the use of discursive operations, that is cognitive aspects of knowledge and understanding is particularly intense and frequent. The principal discursive operation in argumentative interactions is negotiation of meaning.

The negotiation of meaning is the most generalized of discursive operation by which different meanings of linguistic expressions are compared and refined in verbal interactions. An approach to understanding argumentative interaction in problem solving situation is concerned with the choice of better solution of a problem. This process goes hand in hand with an exploration of dialogical spaces in which negotiation of meanings take form.

Andriessen [5] presents a case of using interactive media for supporting collaborative argumentation in an university context. The author illustrates the principal mechanisms underlying argumentative interaction by using computer tools as chat and forum for generating argumentative essays.

The studies on grounding processes of argumentative interaction contribute to gaining more insight into the mechanisms that can support dialogue in collaborative learning environments. The grounding processes, defined as interactive, are concerned on how mutual understanding of knowledge can be constructed and developed [6]. These processes can occur at linguistic level as well as at cognitive level (searching for concepts and problem-solving strategies) [7].

In collaborative research design, the processes can be classified according to the orientation toward design task procedures, group processes or communication process.

Firstly, collaboration concerns the activities related to evolution of task (design activities, elaboration and enhancements of solution). These content-oriented activities reveal how the group resolves the task by sharing and co-elaborating knowledge concerning the resolution, by confronting participants' different perspectives and by converging toward negotiated solution

Secondly, collaboration concerns group management activities such as project management and coordination activities.

Thirdly, communication processes are highly important to ensure the construction of common ground in collaborative process by which the participants mutually establish what they Know.

Grounding is linked to sharing of information through the representation of the environment and the artifact. These activities ensure inter-comprehension and construction of shared or compatible representations of the current state of problem: solution, plans, design rules.

5 Research design

In PhD research we focus the attention on relation between knowledge construction and argumentation in collaborative learning situations. The purpose of this contribution is to present results pertaining to argumentation and learning in tasks that explicitly stress the importance on negotiation of meaning. We consider as subject of study, two small groups (composed by six or seven participant) of academic students who attend the courses of Didactics and Distance Education delivered by open source software platform Moodle. Synchronous chat and asynchronous forum are used for discussion of project work topics to be presented to tutors, peers and teachers.

The duration of the courses is one semester.

For the Didactics course, the discussion on the forum starts from November 2008 to January 2009.

For Distance Education group the discussion starts from March 2009 to June 2009.

The design of PhD is composed by three different stages.

By the first stage, we select 30 threads of forum on Didactics composed by 420 messages and 17 threads from forum of Distance Education constituted by 459 messages.

In the choice of messages the attention is posed on unity of meaning because in asynchronous forum, the interactions take the form of communicative acts.

A unity of meaning is defined as a coherent sentence distinguished from others adjacent and characterized by comma or point.

Within the approach of Grounded Theory methods, data messages have been analyzed by using three different forms of coding: open, theoretical and constant comparative [6].

The process of coding started by defining some sensitizing concepts [7]. These concepts are useful to indicate what to look for during research fieldwork.

The open coding ends with locating the core categories, while theoretical coding allows to develop relationship between categories and their properties.

Step 1. The first step in the analysis of the data is the coding of selected messages. Open coding techniques, a process of labelling the events and ideas represented in the data, are used. The goal of open coding is to create an initial list of conceptual codes, which are grounded in the data. Most of the data is coded using NVivo, a computer software program for qualitative research. At each paragraph of the transcripts of forum discussion graph is assigned one or more conceptual codes. Within grounded theory approach, the data are analyzed without any particular preconceived notion about descriptive labels.

Step 2. At the end of the first stage we begin looking for connections among conceptual codes through several strategies. A set of emergent models are created based on the codes and categories. In this stage, our intuition is guided by increasing levels of theoretical sensitivity. Narratives and stories of participants are considered as important as their request of information in the forum. These aspects provide a valuable way to engage participants in *member checking* especially because they reflect on their experiences.

Step 3: The collection and analysis of data are repeated by comparing emerging categories with those created from the previous stages. It is “the attribute of having insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which isn’t” [8].

The sensitivity can be achieved by a variety of approaches including extensive literature search in related fields of study and a series of reflections on personal and professional experience. Any further data collection and analysis become more selective and guided by the emerging theory in a process known as *theoretical saturation*. At the end of this we reflect about the most recurrent core categories.

6 Sketch of the applied research methodology

In the field of Information System there is an increasing interest toward use of qualitative research methods with an aim to comprehend how ICT issues are context-sensitive. Consequently, the importance is on how the participants are supported by technologies to share meaning.

Most of the researches methods in Information System field include conversation analysis [9] and Grounded Theory approach [10].

Grounded theory approach is driven by the data with the aim to understand and discover patterns. A grounded theory is not built a priori; rather, it emerges during study as data collection, analysis, and theory development occur in parallel.

Research and investigation cannot be undertaken on the assumption that people can simply be questioned, counted and processed; but neither can it be undertaken on the basis that they can simply be observed and recorded.

Grounded Theory method presents an approach that directs the attention of researchers on considering contexts of study as problematic and non obvious. A challenge that can only be met with the contributions of actors involved in the context.

Myers [11] stated that Grounded theory approach is particular useful for developing context-based research oriented to process in an effort to describe argumentative interactions analyzing the messages of different threads.

7 Some results from PhD project

The results of the PhD project leads to the assumption that a substantive theory of argumentative interactions makes sense to understanding the meaning that subject attributed to their action. In according to constructivist interpretation of Theory Grounded Theory [12], Knowledge is a human construct that arises from actions of social beings. The originality assigned to this PhD work is how a theory of argumentation derived from the data can explain the processes of sharing knowledge by using an ethnographic approach.

The results of this study are different by others in the type of software used for elaboration and understanding of data. NVivo 7.0 allows constructing map of argumentative interactions considering from authentic situations.

8 Conclusions and future work: contribution to the problem solution

The results of PhD research indicate that students can be motivated to critically check each other's information through interactive argumentation.

Students construct their own understanding in individual and collective work. This aspect permits them to compare each other's different points of view.

This study, conducted using a qualitative approach, can be considered a point of departure for research on argumentative interaction that taking into account the voice of the participants. It is extremely important give indications to designers of courses.

The design of e-learning course can be done efficiently taking into account the needs, the beliefs and understandings of all learners. This is the most challenging issues of e-learning researches.

Another important aspect that emerges from this PhD project concerns the role of technologies in providing new tools for conducting researches and new means for understanding the way social realities get constructed through discursive behavior.

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