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ARGUMENTATION, COMPUTER SUPPORT, AND THE EDUCATIONAL CONTEXT OF CONFRONTING COGNITIONS

THE KNOWLEDGE AGE

The current period in the history of mankind has been coined as the knowledge age (Brown & Duguid, 2000; Bereiter, 2002). This term serves to distinguish this period from its predecessor, the information age. In contrast to information, knowledge entails a knower, is hard to detach from its owner, and seems to be something that we digest rather than hold. Knowledge lies less in databases than in people, and has to be disclosed by some form of collective activity, and people have to learn how to be engaged in collaborative activities that produce new knowledge. In professional contexts at least, the people who construct knowledge are called 'knowledge workers', a term that can be associated with slavery, under those who coordinate them, and who need knowledge for economic reasons. Because knowledge does not really have ownership, it can be turned into economic value by anyone who knows how to do it. Whatever the undertone, currently there is a more than humanitarian interest in collaborative learning, especially in forms of collaboration that allow people to display and develop their knowledge.

The information age was a label indicating a period characterised by rapid developments in information technology, initially inspired by a naive belief that computers, as storage and retrieval devices, could meet all demands for relevant information, and thereby solve most of our learning problems. Now we know better, but what we still do not fully understand is how to construct *knowledge* technology (Roschelle & Pea, 2002). On the one hand, we suppose that knowledge is highly situational rather than general, and activity-bound rather than a product that can be held. This calls for specific solutions in the form of tools that support situational activities. On the other hand, collaboration is still taken as a general skill, so people can do it, or they cannot. This calls for the opposite type of solution: general, and content free tools, that can be implemented in many collaborative situations. For researchers, the concept of knowledge worker is interesting, because it requires us to think about how to integrate conceptions about knowledge with those of collaborative work, especially in the context of new technologies, without detaching the activities from the individuals and their situation.

The chapters in this book all focus on collaborative learning from the perspective of the learners and their situations. The situations that we examine in our research

are learning situations, which are traditionally designed for the acquisition of knowledge. In parallel with new views on knowledge, but lagging behind to different degrees, education is working on the implementation of collaborative learning, with or without support from new technologies. Information technologies, supporting learning and instruction, as in Intelligent Tutoring Systems, computer simulations, hypertext information systems, focused on content; and the student's main task was to understand this content. New technologies — or instructional artefacts as they are currently termed (e.g. Sutter, 2002) — will support collaborative learning, by supporting the practice of *meaning making* in the context of joint activity (Stahl, 2002; Koschmann, 2002). Schools are to become communities engaged in knowledge creation by processes of inquiry and discovery, not unlike the case of scientific research (Bereiter, 2002). This implies a change of focus for studying learning, from primarily content-based, to being activity- or process-based, and from the individual to the group learning process. The chapters in this book can be characterised as studies of learners being in the uncertain process of transition from one perspective to the other.

The transition is uncertain, as there is no clear existing notion of support for schools or students for achieving these ambitious goals. Even worse, there is no clear picture about how to understand and implement the necessary educational change. There is a need for carefully and sincerely documented practice, showing how changes can be achieved, what problems emerge during such a process, and what improvements that could lead to. As researchers within the CSCL (Computer-Supported Collaborative Learning) community, we study collaborative learning with technology in various learning contexts. The extent to which such contexts display awareness about particular views on learning has a relationship with the nature of the research questions that can be asked. In the section about pedagogical scenarios of this introductory chapter, we try to elaborate a framework to describe the contributions to this volume in this respect.

We claim that the field of CSCL research is now sufficiently mature for it to be worthwhile to focus on learning from one particular type of collaborative activity: argumentation. In this book we understand the term argumentation in a very open way, as any form of collaborative activity that involves *confronting cognitions and their foundations*. For example, a CSCL environment designed to foster learning from argumentation, in this wide sense, could be based on requiring students to confront their individual reasoning in the form of a diagram, it could be based on stimulating and supporting a constructive debate on a particular topic, or it could involve collaborative writing of an argumentative text (with or without argumentative interaction).

The general issue addressed in this volume, and that provides coherence to it, concerns *the roles of argumentation with technologies supporting meaning-making activities in various educational practices*. The present chapter serves as an introduction to the book, and as an attempt to combine issues from different research communities, with respect to learning from argumentation with technology in educational situations: argumentation, argumentation and learning, electronic tools, and the pedagogical context. Rather than summarising each chapter in detail, we provide a set of more general intellectual tools for the reader, in the form of an

analysis of activities, tools and situations associated with argumentative practices in education. Whilst this book presents something of a state of the art on these complex issues, it is not yet possible to present a complete integration, to answer such detailed questions as “what types of argumentation should be fostered, and in what way, within a community of secondary school learners being engaged in an assignment where they collaboratively are to discuss two controversial essays about using new media for learning, to what types of knowledge and learning would that give rise, and how should their practice be changed in order to improve the depth of their argumentation?”.

Instead, the chapters in this book address various perspectives on the main questions stated above, that is, how to design computer-supported collaborative learning environments that favour: (1) collaborative learning interactions with representational support (chapters 2 and 7), (2) argumentative interactions with respect to scientific notions (chapters 3 and 9), (3) argumentative interactions during collaborative writing about societal issues (chapter 4), (4) argumentative activities during electronic discussions in academic practice (chapters 5 and 8), and (5) development of argumentation skills in a community (chapter 6).

One dimension on which the contributions can be aligned may be distinguished here. The perspective on educational practice can be from top-down or bottom up viewpoints. From the top down, there are ideas about how learning to argue should be organised, how participants can be subjected to a task design and task sequence, which provides ideas about how such settings lead to specific changes in argumentative activities. This may be accompanied by a relatively great involvement of teachers and researchers in actually getting the students to be engaged in the desired types of activities. From the bottom up, the idea is that practice is characterised in a specific manner, and the goal of the researcher is to find out how to characterise argumentative activities within that practice, supported by an electronic tool. This may involve greater responsibility for learners for engaging in learning activities. This combination of approaches across the chapters should allow readers to take on a dynamic perspective, so that bottom-up and top-down positions can be integrated.

In the next sections, we first discuss our general notion about confronting cognitions and the role of argumentation in learning, giving pointers towards how certain chapters approach this notion. We then present a general discussion about electronic support for argumentation, in relation to each chapter.. Finally, we present three general pedagogical approaches with respect to collaborative learning and try to situate contributions to this volume within these approaches. By moving from the general to the specific, we feel that perspectives from a CSCL-sub domain can provide inspiration to the CSCL field in general.

CONFRONTING COGNITIONS

This book is about learning from confronting cognitions in argumentative interactions, in situations where students use Computer-Supported Collaborative Learning (CSCL) environments. These are computer-based learning environments

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