

Introduction

Nathalie Muller Mirza and Anne-Nelly Perret-Clermont

Argumentation constitutes an important dimension of daily life and of professional activities. It also plays a special role in democracies and is at the heart of philosophical reasoning and scientific inquiry. Argumentation has an increasing importance in education, not only because it is an important competence that has to be learned, but also because argumentation can be used to foster learning in philosophy, history, sciences and mathematics, and in many other domains. During the last decade, argumentation has attracted growing attention as a linguistic, logical, dialogical, and psychological process that sustains or provokes reasoning and learning.

As a means of improving students' understanding in the classroom, argumentation can be called upon to trigger learning in many ways. Argumentative practices involve making explicit and public one's own stance and justifying it to another person or to oneself. Argumentation allows for explorative, critical and enquiring approaches to reality: encouraged to test the validity of each other's ideas, the learners are led to formulate objections and counter-objections and to understand a multiplicity of positions. Argumentative practices in science education are interesting because they invite pupils to use and come to understand rules of reasoning that are used in scientific work: pupils search for reasons, examine the available data, test alternative hypotheses, etc., which allows them to discover that science is more about trying to construct and resolve problems in specific theoretical frames than a matter of "discovering" things that might have been hidden since the beginning of the world. This is in contrast with students and laypersons' preconceptions. It implies that confrontation of perspectives is "fair-play" and that submitting to majority world views, prejudices, or status does not contribute to knowledge construction. Argumentative practices are powerful resources to deal with cognitive contradictions, doubts, controversies, complex decisions, etc. They invite participants to engage both in reasoning and in search of information. They require participants to coordinate their actions and reflections and to experiment with a reflexive position that enhances decentration

N. Muller Mirza (✉) and A.-N. Perret-Clermont
Department of Psychology, Faculty of Political and Social Sciences,
University of Lausanne, Lausanne, Switzerland
e-mail: Nathalie.MullerMirza@unil.ch

capacities. Because learning does not solely mean acquisition of information or the appropriation of ready-made objects of knowledge, argumentation also entails the emergence of new understandings and the creative restructuring of previous ones: the learner is the co-author of a constructive socio-cognitive process in which argumentation holds important functions.

Argumentation is thus of interest to researchers and practitioners in education who are concerned with the social and cognitive processes that promote learning. However, learning argumentation and learning by arguing raises theoretical and methodological questions: How and when do learning processes develop in argumentation? Is it the case for all subjects? How does one design effective argumentative activities? How can the argumentative efforts of pupils be sustained? What are the psychological issues involved when arguing with others? How can what the learners produce be analyzed and evaluated? The argumentative activity requires specific intellectual and social skills and it is often emotional and demanding. Introducing argumentative activities in educational settings is not yet common. It requires attention at different levels. The complex argumentation skills must be given opportunities to develop in the growing child. At the interpersonal level, argumentation means confronting other people's perspectives. People often avoid these kinds of situations, which they tend to perceive as a risk to the self and to the relationship. At the institutional level, argumentative activities are sometimes considered time consuming when curricula are already overloaded. These activities require special social skills from the teachers, as well as ad hoc teacher training and assessment practices. At the cultural level, argumentation means the acceptance that social harmony is not threatened by the expression of a plurality of opinions; that assertions have to be backed up; that authority is not sufficient; and that discussions are permitted even when relationships are asymmetrical.

As a result of this complexity, it is not possible for teachers to just improvise argumentation based learning activities in the classroom. Precise design and adaptive management are needed. This book offers perspectives on these issues in an interdisciplinary effort to develop original theoretical and methodological perspectives using results from empirical research. The authors, active in the fields of theory of argumentation, psychology, and education, provide here elements to understand what happens when argumentation is introduced into the classroom. They share a common perspective on argumentation with special attention paid to communication and context. They also share a common understanding of education as oriented toward the enhancement of individual and collective agency in the development of knowledge, sociability and democratic social responsibility.

The book is organized into two main parts: theoretical foundations and research results are presented in the first part and an examination of existing innovative practices and lessons learned from them constitutes the second part.

The development of argumentation theories in the contemporary epistemological scene is central to the chapter "Argumentation as a social and cultural resource" by Eddo Rigotti and Sara Greco Morasso. They consider, in particular, the pragmatodialectical approach for its focus on the theoretical kernel of the discipline and for systematically eliciting, from this, the connected methodological implications.

The key notion of argument is specified by comparing it to the apparently near notion of demonstrative proof. Analogies and differences are brought to light, and the rather fuzzy but challenging and fundamental notion of *reasonableness* is identified as denoting the main value at stake in argumentative interactions. The authors propose a model of argumentative intervention in which argumentation is conceived as a particular type of communicative interaction. The model aims both at producing and at analyzing/evaluating argumentative interventions. The fundamental claim is that assuring the quality of argumentation implies contributing to a healthy social consensus and promoting cultural development at the individual and collective levels.

The chapter, "Psychosocial processes in argumentation," by Nathalie Muller Mirza, Anne-Nelly Perret-Clermont and colleagues, examines argumentation as a psychosocial practice embedded in institutional, historical and cultural contexts. Argumentation occurs when the conversation flow is disrupted by a disagreement, a question, or an alternative hypothesis. It is not easy to develop this peculiar communication, as it entails complex issues at the personal and interpersonal levels. Even though they are in reality interwoven, several dimensions are distinguished. At the cognitive and individual level, the questions include the following: what are the cognitive prerequisites for engaging in an argumentative interaction? How is the development of argumentative skills taking place in children? Beyond the individual level the authors take into consideration other dimensions that are important, such as the relational and dialogical aspects of argumentation, the status of the partners, and the characteristic of the "audience." The specific demands of the institutional and cultural context in which argumentation takes place are also examined. Developmental, social, and socio-cultural approaches in psychology are thus convened in order to construct a better understanding of this complex practice.

Baruch Schwarz's chapter provides multiple perspectives on the intricate relationship between argumentation and learning. Different approaches to learning impinge on the way argumentation is conceived: as a powerful vehicle for reaching shared understanding, as a set of skills pertaining to critical reasoning, or as a tool for social positioning. Each perspective has harvested empirical studies that have stressed the importance of argumentation in learning. In spite of the pluralistic stance adopted, this chapter attempts to draw connections between the findings obtained in the different perspectives. In a separate part, it considers the specific role of argumentation in the learning processes and outcomes for four subject areas: in mathematics, studies are presented that show deep gaps between argumentation and proof; in science, experimental studies are reviewed to examine whether and how argumentation promotes conceptual change; in history, the chapter considers the role of argumentation in challenging narratives and in claiming a position; and lastly, the chapter describes the new wave that characterizes civic education programs toward the instillation of argumentative practices in democratic citizenship.

Under the title "Argumentation and the social construction of knowledge," Michael Baker deals with two questions: firstly, what might students learn by engaging in argumentative interactions? And secondly, by what cognitive-interactive processes might they achieve this? An approach to understanding argumentative interactions, produced in problem-solving situations, is outlined and shows them

essentially as attempts to solve an interlocutory problem, i.e., that of deciding which putative problem solutions to accept or not, by drawing on additional knowledge sources (termed “[counter] arguments”) that potentially change the degrees of the acceptability of solutions. This process goes hand in hand with the exploration of a dialogical space and with the negotiation of the meaning of key notions underlying the debate. The analysis of an example of argumentative interaction, involving two adolescent students in a physics classroom, reveals this exploratory process, together with the essentially unstable nature of students’ viewpoints, given that they are engaging in argumentation with respect to ideas that are still under co-construction.

Baruch Schwarz and Jerry Andriessen, in their common chapter “Argumentative design,” discuss the educational architecture of argumentative activities. Productive argumentative activity may be encouraged, for example, by elicitation procedures, with argumentative scripts, by confronting subjects with hypothesis testing, and by pairing peers that have differences of opinion. What are the main results that research has delivered in such cases? A second section of the chapter is devoted to the designed use of collaborative technology for fostering and representing argumentation. Experiments using scenarios which feature a blend of technology and human interaction are discussed.

Beginning the second part of the book, Neil Mercer’s chapter, “Developing argumentation: lessons learned in the primary school,” argues three main points: first, that one of the most important aims of education ought to be to develop children’s capability for argumentation; secondly, that teachers can make a significant contribution to this development; and thirdly, that the development of children’s use of language as a tool for argumentation helps the development of their individual intellectual capabilities. To do so, Neil Mercer first discusses the importance of children’s engagement in dialogue for the development of their thinking and understanding. He then considers education as a dialogic process in which both the talk between teachers and learners and the talk among learners have important roles to play. Finally, he describes some classroom-based research which has enabled teachers to encourage the development of children’s use of spoken language for thinking and arguing effectively together, and which has also provided empirical support for the relationship among thought, language, and social activity, as claimed by the Russian psychologist Lev Vygotsky.

The practice oriented contribution, “Argumentation in higher education,” by Jerry Andriessen presents one case of using interactive media for supporting collaborative argumentation by university students. The discussion is descriptive, focusing on the scenario and the tools that are used and on examples of actual discussions by students. Some basic mechanisms of employing argumentation are illustrated by students using computer tools (chat, forums, graphical tools) for producing an argumentative essay. This chapter shows some of the characteristic constraints that are involved in implementing argumentative learning in university practice.

How can argumentation skills be improved by engaging students in argumentative practices where they are helped to assume a healthy critical attitude and provide reasons for their positions? What are the synergies of learning to argue and arguing to learn? “The Argumentum experience” by Sara Greco Morasso, originates from

these questions and relies on the experience of teaching argumentation at university level in the framework of the Swiss Virtual Campus project Argumentum (<http://www.argumentum.ch>). After presenting the aim and structure of Argumentum, this study focuses on a specific experience of argument production and analysis that occurred in the pedagogical scenario of argumentation classes at the master’s level. Finally, the chapter elaborates on the lessons learned from this experience.

By drawing upon existing theoretical and empirical resources to discuss the successes and difficulties encountered in trying to introduce or sustain argumentative activities in learning settings, the authors of this book hope to contribute to the promotion of a large program of research. In their opinions, considering argumentation as a key activity at the heart of many developmental processes, in individuals and in society, opens the way to a deeper reconsideration of teacher training, curricula, and also of the nature of human knowledge and its potential advancements.