Foreword

Information and Communication Technologies (ICTs) are considered to be the most powerful tools for the support of the teaching and learning processes. The main contribution of the ICTs comes from their technological characteristics; the ways they record, manage, represent and communicate information.

The essential contribution of ICTs to the learning process comes indirectly, through certain features that arise for the above technological characteristics. The pedagogical usage of ICTs mainly involves active participation of learners and teachers in meaningful interactive activities, in personalized and collaborative analog and digital learning environments.

Knowledge construction together with critical and creative thinking is the main objective of education, as far as it regards the cognitive level. Collaboration in a learning environment is also an important educational objective that beyond the cognitive, involves the affective domain. In social constructivist models for learning, knowledge is constructed through social negotiation in learning environments that provide the context for authentic tasks, multiple representations and foster reflective practices.

Learning occurs in an educational context, being either analog or digital, and presupposes purposeful collaborative interactions. The Quality of Collaboration (QoC), Balance of Collaborative Activity (BCA), and Quality of Interaction (QoI) are among the factors that play important role in collaborative knowledge construction. They give empirical data that can be used for the evaluation and the improvement of learning. By finding ways to measure QoC, BCA and QoI efficiently, the learning process is improved and metacognitive skills are developed. Fuzzy logic can contribute to that, and this is the scope of this book.

The book proposes fuzzy logic-based modeling in collaborative and blended learning. This is a promising way to model collaboration in Online Learning Environments (OLE). By modeling the interactions and collaborative strategies adopted by learners and teachers as extracted by the use of fuzzy inference systems (FIS) and adaptive network-based FIS (ANFIS), learning styles and didactic techniques could be analyzed and contribute to learning quality.

The book has a social constructivist view to educational technology and this drives successfully through computer-supported collaborative learning approach and blended understanding within learning management systems. Fuzzy logic and fuzzy logic-based inference systems are introduced in a comprehensible way and guide the reader to FIS-based modeling in learning. This is the authors’ inspiration for a more efficient personalized learning in digital collaborative environments. The book ends with the presentation of key-issues towards an effective OLE in Higher Education Institutions and the authors’ vision for the future by proposing the bridging of affective, blended and collaborative learning potentialities.

Every chapter of the book, even the technical ones, is permeated by a pedagogic view that is necessary in every approach to learning technologies.
The book is an excellent paradigm of how digital technology contributes to the teaching and learning processes, and especially to knowledge construction. The book constitutes a study towards a better educational process in both digital and analog worlds.

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