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Book Review

Fuzzy Logic-Based Modeling in Collaborative and Blended Learning

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Fuzzy Logic-Based Modeling in Collaborative and Blended Learning
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INTRODUCTION

In the last decade, e-learning was dynamically growing and challenged educational organizations, learning designers, researchers and educators, around the globe, to consider new ways of delivering education programs, with the aim to provide multiple opportunities for self-directed learning, collaborative and ubiquitous learning. The emerging, innovative on-line learning technologies are nowadays used by a wide variety of learners/ students with different goals, preferences, learning habits, knowledge background, skills and capabilities. Literature suggests that the most effective way to enhance individuals' learning experiences is to provide them learning environments with high level of personalized characteristics.

In this perspective, adaptive and collaborative e-learning systems are considered as the most important environments to promote personalization of learning and improve the overall effectiveness of e-learning activities, courses and programs. At the same time, learning is a very complex process, because many dynamically interrelated components are involved. Therefore, these components demand the consideration of numerous intervening factors, such as learner's profile, their skills and attitudes, learning goals, pedagogical strategies and learning support, educational material used etc.

In this context, the authors debated on and suggested the Fuzzy Logic (FL) perspective as an alternative method to design and provide new modeling insights in personalized learning experiences, in blended and collaborative learning environments that use various technologies (Learning Management Systems, Web 2.0, Semantic Web etc.) and pedagogical approaches. The main idea is to combine numerical and linguistic data to model the qualitative aspects of students' learning experiences, cognitive and reasoning processes, interaction and collaboration activities that result in enhanced learning outcomes, without employing precise quantitative analysis. Therefore, this book

provided a novel but a comprehensive insight to the fields of computer-supported collaborative and blended learning, by integrating the notions of fuzzy logic and adaptive networks.

ORGANIZATION OF THE BOOK

This book provides a valuable, comprehensive collection of chapters written by experts in the field. In addition, it offers a thorough insight regarding the design and investigation of online and blended learning programs, through the lens of fuzzy logic. Addressing current trends and perspectives regarding FL and on-line learning settings, with a main focus on computer supported collaborative learning and blended learning, the book is structured along four sessions that present a) the theoretical foundations and perspectives of on-line collaborative learning, b) the theoretical foundations of fuzzy logic, c) adaptive fuzzy logic modelling tools, and d) evaluation and analysis schemata integrating the FL concept into current e-learning contexts.

In particular, by adopting a systemic approach, the main contribution of this book is that it effectively addresses the application of fuzzy logic-based modelling in on-line learning and blended learning contexts by:

- Analysing critical aspects of the fuzzy logic concept and documenting the transfer of FL to educational contexts;
- Providing a series of adaptive fuzzy knowledge-based models, which combine Fuzzy Inference Systems with sets of collaborative and metacognitive data, in order to ground an adaptive system supporting collaborative and blended learning;
- Providing flexible metrics, like Quality of Collaboration (QoC), Balance of the Collaborative Activity (BCA), Quality of Interaction (QoI), that determine Fuzzy Inference Systems and increase the adaptiveness of learning support to learners' needs;
- Revealing learners' cognitive and behavioral aspects in collaborative and blended learning contexts, using fuzzy logic-based modelling schemata.

SUMMARY

In conclusion, this book provides a valuable contribution to the existing literature of e-learning and the related research methodologies. It offers both a breadth and depth of coverage in issues linking fuzzy logic, e-learning, collaborative and blended learning, instructional design and knowledge modelling, along with efficient analytical tools that cannot be easily found elsewhere. This book should be included in any academic and research library since it can serve as a valuable resource and reference book for academics, researchers, educators, post graduate students and practitioners in a full range of e-learning fields.

READERSHIP

Addressing many of the fundamental issues in the field, this estimable book is expected to be a top resource for those seeking the most comprehensive, in-depth coverage of the many aspects and current developments determining the relation of fuzzy logic and e-learning. Researchers, practitioners, educators, and students, in various areas of learning technologies and on-line learning, will find a sound theoretical framework and a series of valuable analytical tools that can support novel investigations in blended and collaborative e-learning systems.

Athanassios Jimoyiannis is a Professor of Science and ICT in Education at the Department of Social and Educational Policy, University of Peloponnese, in Greece. He has more than twenty-seven years of professional experience in research and teaching, at university level and teacher professional development. His current research interests include e-learning and ICT in education, teachers' professional development on ICT in education, social media and Web 2.0 in education, digital literacy, and computer science education. He has published articles in various peer-reviewed scientific journals and international conference books. Since 1996, he has been involved in a wide range of national and EU/international research and development projects, in relation to ICT in education, which aim to integrate learning technologies in formal education and teacher development. Prof. Jimoyiannis has been leading the e-Learning Research Group (e-LeReG) at the Department of Social and Educational Policy for more than 10 years. He is member of the Scientific Review Board in various international journals and conferences in the areas of e-learning and ICT in education. He is the co-founder and co-editor of the peer-reviewed academic journal "Themes in Science and Technology Education", devoted to international research on science and computer science education, ICT in education and e-learning.