# Table of Contents

Preface ........................................................................................................................................... xxiii

Acknowledgment .......................................................................................................................... xxvi

## Section 1

### Three-Dimensional Virtual Learning Environments

**Chapter 1**
Contributions of Collaborative and Immersive Environments in Development a Remote Access Laboratory: From Point of View of Effectiveness in Learning......................................................... 1

*Ronald Zamora, Universidad de la Costa, Colombia*

*Jeimy Vélez, Universidad Pontificia Bolivariana, Colombia*

*Jose L. Villa, Universidad Tecnológica de Bolívar, Colombia*

**Chapter 2**
Virtual Laboratories Development Using 3D Environments.............................................................. 29

*Toni Amorim Oliveira, University State of Mato Grosso, Brazil*

*Norian Marranghello, UNESP/IBILCE, Brazil*

*Alessandro César Rodrigues Silva, FEIS/UNESP, Brazil*

*Aledir Silveira Pereira, UNESP/IBILCE, Brazil*

**Chapter 3**
3D Virtual Learning Environments: An Avatar-Based Virtual Classes Platform............................. 54

*Tiago Cinto, University of Campinas, Brazil*

*Harlei Miguel de Arruda Leite, UFOP, Brazil*

*Sarah Negreiros Carvalho, Federal University of Ouro Preto, Brazil*

*Cecilia Sosa Arias Peixoto, UNISAL, Brazil*

*Dalton Soares Arantes, UNICAMP, Brazil*

**Chapter 4**
Personalisation of 3D Virtual Spaces for Enhanced Ubiquitous Learning........................................ 87

*Noha Saleeb, Middlesex University, UK*

*Georgios Dafoulas, Middlesex University, UK*

*Martin Loomes, Middlesex University, UK*
Chapter 5
Architectures for 3D Virtual Environments

Thiago Pereira Rique, Federal Rural University of the Semiarid Region, Brazil
Samara Martins Nascimento, Federal University of Ceará, Brazil
Rodrigo da Cruz Fujioka, Federal University of Pernambuco, Brazil
Fernando da Fonseca de Souza, Federal University of Pernambuco, Brazil

Chapter 6
Designing Educational Paths in Virtual Worlds for a Successful Hands-On Learning: Cultural Scenarios in NetConnect Project

Assunta Tavernise, Università della Calabria, Italy
Francesca Bertacchini, Università della Calabria, Italy

Chapter 7
Reviewing the Effectiveness and Learning Outcomes of a 3D Virtual Museum: A Pilot Study

Greg Jones, University of North Texas, USA
Adriana D. Alba, University of West Georgia, USA

Chapter 8
Training Infrastructure to Participate in Real Life Institutions: Learning through Virtual Worlds

Pablo Almajano, University of Barcelona, Spain
Maite Lopez-Sanchez, University of Barcelona, Spain
Inmaculada Rodriguez, University of Barcelona, Spain
Anna Puig, University of Barcelona, Spain
Maria Salamó Llorente, University of Barcelona, Spain
Mireia Ribera, University of Barcelona, Spain

Chapter 9
Impact Assessment of Affective Virtual Characters in a Virtual Environment

Tiago Vinícius Ficagna, UNIVALI, Brazil
André Raabe, UNIVALI, Brazil

Chapter 10
Exploring 3D Immersive and Interactive Technology for Designing Educational Learning Experiences

Min Liu, The University of Texas at Austin, USA
Simon Su, Texas Advanced Computing Center, USA
Sa Liu, The University of Texas at Austin, USA
Jason Harron, The University of Texas at Austin, USA
Cynda Fickert, The University of Texas at Austin, USA
Bill Sherman, Indiana University, USA
Chapter 11
Faculty Adoption of 3D Avatar-Based Virtual World Learning Environments: An Exploratory Case Study ........................................... 262
  Susan Dass, ICF International, USA
  Nada Dabbagh, George Mason University, USA

Chapter 12
Survey of Students’ Perception and the Influence of Learning Style Preferences on Learner’s Intention to Use 3D Visualization Instruction: Learning Style and 3D Visualization Instruction ..... 297
  Yu-Hsin Hung, National Taiwan University, Taiwan
  Ray I. Chang, National Taiwan University, Taiwan
  Chun Fu Lin, National Taiwan University, Taiwan

Section 2
Educational Hypermedia and Ubiquitous Learning: Future Trends

Chapter 13
Memory, Cognition, and Multimedia: Role of the Importance of Organizing Knowledge in Memory with Hypermedia Help and Online Co-Understanding Systems ........................................... 318
  Dorsaf Ben Ismail Ben Romdhane, l’Université virtuelle de Tunis, Tunisia
  Mohammed Yousef Alkhatib, Al Albayt University, Jordan
  Denis Legros, Université Paris 8, France

Chapter 14
Effects of Studying Tasks Compatibility with Tablets on Their Acceptance: How Experienced Tasks with Tablets Can Modify Perceptions of Tablets................................................................. 338
  Franck Amadieu, University of Toulouse, France
  Charly Pecoste, University of Toulouse, France
  Claudette Mariné, University of Toulouse, France
  Cécile van de Leemput, Université Libre de Bruxelles, Belgium
  Colin Lescarret, University of Toulouse, France

Chapter 15
The Role of Pedagogical Agents on Learning: Issues and Trends................................................................. 362
  Michelle Taub, North Carolina State University, USA
  Seth A. Martin, North Carolina State University, USA
  Roger Azevedo, North Carolina State University, USA
  Nicholas V. Mudrick, North Carolina State University, USA

Chapter 16
Enhancing the Effectiveness of Educational Hypermedia: A Cognitive Load Approach ........... 387
  Anne-Marie Singh, University of New South Wales, Australia
  Slava Kalyuga, University of New South Wales, Australia
Chapter 17
A Perspective about the Application of Quality of Context in U-Learning Environments .......... 410
Felipe Becker Nunes, Federal University of Rio Grande do Sul, Brazil
Fabricio Herpich, Federal University of Rio Grande do Sul, Brazil
Gleizer Bierhalz Voss, Federal Institute of Education Science and Technology Farroupilha,
Brazil
Roseclea Duarte Medina, Federal University of Santa Maria, Brazil

Chapter 18
Examining the Effectiveness of Hyperaudio Learning Environments ........................................ 433
Joerg Zumbach, Paris Lodron University of Salzburg, Austria
Stephanie Moser, Technical University of Munich, Germany

Chapter 19
Content Personalized Recommendation Engine to Support an Informal Learning Environment in
the Health Context .............................................................................................................................. 451
Alisson Alan Lima da Costa, Rural Federal University of Semi-Arid, Brazil
Francisco Milton Mendes Neto, Rural Federal University of Semi-Arid, Brazil
Enio Lopes Sombra, Rural Federal University of Semi-Arid, Brazil
Jonathan Darlan Cunegundes Moreira, Rural Federal University of Semi-Arid, Brazil
Rafael Castro de Souza, Rural Federal University of Semi-Arid, Brazil
Jerffeson Gomes Dutra, Rural Federal University of Semi-Arid, Brazil

Chapter 20
Systems Engineering Concepts with Aid of Virtual Worlds and Open Source Software: Using
Technology to Develop Learning Objects and Simulation Environments ....................................... 483
Latina Davis, Morgan State University, USA
Maurice Dawson, University of Missouri – St. Louis, USA
Marwan Omar, Saint Leo University, USA

Chapter 21
Three-Dimensional Virtual Environment and NPC: A Perspective about Intelligent Agents
Ubiquitous ........................................................................................................................................... 510
Fabricio Herpich, Federal University of Rio Grande do Sul, Brazil
Felipe Becker Nunes, Federal University of Rio Grande do Sul, Brazil
Gleizer Bierhalz Voss, Federal Institute of Education Science and Technology Farroupilha,
Brazil
Roseclea Duarte Medina, Federal University of Santa Maria, Brazil

Chapter 22
An Extended Acceptance Model for Augmented Reality Educational Applications ................... 537
Alexandru Balog, National Institute for Research and Development in Informatics, Romania
Costin Pribeanu, National Institute for Research and Development in Informatics, Romania
Chapter 23
A Three-Dimensional Environment of Personalized Recommendation of Learning Objects to Support Ubiquitous Learning.............................................................................................................. 555

Rodrigo Valença Cavalcante Frade, Rural Federal University of Semi-Arid, Brazil
Francisco Milton Mendes Neto, Rural Federal University of Semi-Arid, Brazil
Rafael Castro de Souza, Rural Federal University of Semi-Arid, Brazil

Compilation of References ........................................................................................................581

About the Contributors .............................................................................................................655

Index........................................................................................................................................... 669