Contents

Volume 1

Section I. Fundamental Concepts and Theories

This section serves as the foundation for this exhaustive reference tool by addressing crucial theories essential to the understanding of Web-based learning. Chapters found within these pages provide an excellent framework in which to position Web-based education within the field of information science and technology. Individual contributions provide overviews of the history of e-learning, students’ decision to use online versus traditional courses, Web-based resources for teaching, and key elements of online learning communities. Within this introductory section, the reader can learn and choose from a compendium of expert research on the elemental theories underscoring health information systems research.

Chapter 1.1. A Brief History of eLearning

Terry T. Kidd, Texas A&M University, USA

Chapter 1.2. Technological Trends in Adult Education: Past, Present and in the Future

John K. Hope, University of Auckland, New Zealand

Chapter 1.3. The Proliferation, Pitfalls, and Power of Online Education

Leah Blakey, Drury University, USA

Chapter 1.4. The Virtual University: Distance Learning Spaces for Adult Learners

David S. Stein, The Ohio State University, USA
Hilda R. Glazer, Capella University, USA
Constance E. Wanstreet, The Ohio State University, USA
Section II. Development and Design Methodologies

This section provides in-depth coverage of conceptual architectures, frameworks and methodologies related to the design and implementation of Web-based educational systems. Throughout these contributions, research fundamentals in the discipline are presented and discussed. From broad examinations to specific discussions on particular frameworks and infrastructures, the research found within this section spans the discipline while also offering detailed, specific discussions. Basic designs, as well as abstract developments, are explained within these chapters, and frameworks for educating and preparing online instructors, designing virtual classrooms, and creating effective user interfaces are provided.

Chapter 2.1. Spiraling into Transformative Learning ................................................................. 249
Patricia Cranton, The Pennsylvania State University, Harrisburg, USA

Chapter 2.2. Transitioning to E-Learning: Teaching the Teachers ............................................. 259
Bethany Bovard, New Mexico State University, USA
Susan Bussmann, New Mexico State University, USA
Julia Parra, New Mexico State University, USA
Carmen Gonzales, New Mexico State University, USA

Chapter 2.3. Preparing Online Instructors: Beyond Using the Technology ................................... 277
Evelyn S. Johnson, Boise State University, USA
Jane Pitcock, Walden University, USA

Chapter 2.4. A Description of Online Instructors Use of Design Theory ..................................... 293
MarySue Cicciarelli, Duquesne University, USA
Chapter 2.5. Internet-Enabled User Interfaces for Distance Learning
We Liu, National University of Singapore, Singapore
Keng Soon Teh, National University of Singapore, Singapore
Roshan Petris, National University of Singapore, Singapore
Yongsoon Choi, National University of Singapore, Singapore
Adrian David Cheok, National University of Singapore, Singapore
Charissa Lim Mei-Ling, Nanyang Technological University, Singapore
Yin-Leng Theng, Nanyang Technological University, Singapore
Ta Huynh Duy Nguyen, National University of Singapore, Singapore
Tran Cong Thien Qui, National University of Singapore, Singapore
Athanasios V. Vasilakos, University of Peloponnesse, Greece

Chapter 2.6. Balancing Tradeoffs in Designing, Deploying, and Authoring Interactive Web-Based Learn-By-Doing Environments
Lin Qiu, State University of New York at Oswego, USA

Chapter 2.7. Supporting Group and Individual Processes in Web-Based Collaborative Learning Environments
F. Pozzi, Istituto Tecnologie Didattiche – CNR, Italy

Chapter 2.8. Designing Dynamic Learning Environment for Web 2.0 Application
Robert Z. Zheng, University of Utah, USA

Chapter 2.9. Designing Web-Based Training Courses to Maximize Learning
Traci Sitzmann, Advanced Distributed Learning Co-Laboratory, USA
Katherine Ely, George Mason University, USA
Robert Wisher, U.S. Department of Defense, USA

Chapter 2.10. Implementing Successful Online Learning Communities
Diane E. Beck, University of Florida, USA
Sven A. Normann, University of Florida, USA

Chapter 2.11. Web Accessibility Essentials for Online Course Developers
Jozenia Torres Colorado, Emporia State University, USA
Jane H. Eberle, Emporia State University, USA

Chapter 2.12. Designing the Virtual Classroom for Management Teaching
Parissa Haghirian, Sophia University, Japan
Bernd Simon, Vienna University of Economics and Business Administration, Austria

Chapter 2.13. Augmenting Collaboration with Personalization Services
Christina E. Evangelou, Research Academic Computer Technology Institute, Greece
Manolis Tzagarakis, Research Academic Computer Technology Institute, Greece
Nikos Karousos, Research Academic Computer Technology Institute, Greece
George Gkotsis, Research Academic Computer Technology Institute, Greece
Dora Nousia, Research Academic Computer Technology Institute, Greece
Chapter 2.14. Profiling Group Activity of Online Academic Workspaces:
The Hellenic Open University Case Study................................................................. 446
  D. Karaiskakis, Hellenic Open University, Greece
  D. Kalles, Hellenic Open University, Greece
  Th. Hadzilacos, Hellenic Open University, Greece

Chapter 2.15. The Effectiveness of Scaffolding in a Web-Based, Adaptive Learning System........ 459
  Mei-Yu Chang, National Hsinchu University of Education, Taiwan
  Wernhuar Tarng, National Hsinchu University of Education, Taiwan
  Fu-Yu Shin, Chien-Kuo Elementary School, Taiwan

Chapter 2.16. Community of Inquiry in Adult Online Learning:
  Collaborative-Constructivist Approaches.................................................................. 474
  Zehra Akyol, Middle East Technical University, Turkey
  D. Randy Garrison, University of Calgary, Canada

Chapter 2.17. Development of Online Distributed Training: Practical Considerations and Lesson Learned................................. 490
  Eileen B. Entin, Aptima Inc., USA
  Jason Sidman, Aptima Inc., USA
  Lisa Neal, eLearn Magazine, USA

Chapter 2.18. Virtual Tour: A Web-Based Model of Instruction........................................ 502
  Melissa B. Holler, Agora Cyber Charter School, USA

Chapter 2.19. Enhancing Skills of Application Software via Web-Enabled Problem-Based Learning and Self-Regulated Learning: An Exploratory Study .............................. 508
  Pei-Di Shen, Ming Chuan University, Taiwan
  Tsang-Hsiung Lee, National Chengchi University, Taiwan
  Chia-Wen Tsai, Ming Chuan University, Taiwan

Section III. Tools and Technologies

This section presents extensive coverage of the technology that informs and impacts Web-based education. These chapters provide an in-depth analysis of the use and development of innumerable devices and tools, while also providing insight into new and upcoming technologies, theories, and instruments that will soon be commonplace. Within these rigorously researched chapters, readers are presented with examples of the tools that facilitate and support the emergence and advancement of Web-based education. In addition, the successful implementation and resulting impact of these various tools and technologies are discussed within this collection of chapters.

Chapter 3.1. Student Perceptions and Pedagogical Applications of E-Learning Tools in Online Course.................................................................................. 524
  C. Candace Chou, University of St. Thomas, USA
Chapter 3.2. The Hybrid Course: Facilitating Learning through Social Interaction Technologies

Lorraine D. Jackson, California Polytechnic State University, USA
Joe Grimes, California Polytechnic State University, USA

Chapter 3.3. Integrated Design of Web-Platform, Offline Supports, and Evaluation System for the Successful Implementation of University 2.0

Soyoung Kim, Yonsei University, Korea
Minyoung Kim, Yonsei University, Korea
Junhee Hong, Kyungwon University, Korea

Chapter 3.4. Using a User-Interactive QA System for Personalized E-Learning

Dawei Hu, University of Science and Technology of China, China
Wei Chen, City University of Hong Kong, China
Qingtian Zeng, Shandong University of Science and Technology, China
Tianyong Hao, City University of Hong Kong, China
Feng Min, City University of Hong Kong, China
Liu Wenyin, City University of Hong Kong, China

Chapter 3.5. Examining the Relationship Between Course Management Systems, Presentation Software, and Student Learning: An Exploratory Factor Analysis

Daria C. Crawley, Robert Morris University, USA
Barbara A. Frey, University of Pittsburgh, USA

Chapter 3.6. Web-Based Interface Elements in Team Interaction and Learning: Theoretical and Empirical Analysis

Klarissa Ting-Ting Chang, Carnegie Mellon University, USA
John Lim, National University of Singapore, Singapore
Yingqin Zhong, National University of Singapore, Singapore

Chapter 3.7. Opportunities for Open Source E-Learning

Fanuel Dewever, IBM, Belgium


Nektaria Adaktiou, University of Athens, Greece
Costas Cartalis, University of Athens, Greece
George Kalkanis, University of Athens, Greece

Chapter 3.9. eLearning in the Cloud

Niall Sclater, The Open University, UK

Chapter 3.10. Transforming Pedagogy Using Mobile Web 2.0

Thomas Cochrane, Unitec, New Zealand
Roger Bateman, Unitec, New Zealand
Section IV. Utilization and Application

This section introduces and discusses the utilization and application of Web-based educational systems around the world. These particular selections highlight, among other topics, online teacher training programs, the creation of online virtual laboratories, and current Web-based teaching practices from India to Japan to Brazil. Contributions included in this section provide excellent coverage of today’s online environment and insight into how health information systems impact the fabric of our present-day global village.

Chapter 4.1. Exploration on E-learning Methods and Factors Hindering their Usage: An Empirical Case Investigation
Chengbo Wang, Glasgow Caledonian University & University of Bolton, UK

Chapter 4.2. Stories of Engagement with E-Learning: Revisiting the Taxonomy of Learning
Geoffrey Lautenbach, University of Johannesburg, South Africa
Chapter 4.12. Web 2.0 Technologies for Problem-Based and Collaborative Learning: A Case Study ................................................................. 939
*Clive N. Buckley, Glyndŵr University, UK
Angela M. Williams, Glyndŵr University, UK*

Chapter 4.13. Adult Learners Learning Online: A Case Study of a Blogging Experience ............. 947
*Danilo M. Baylen, University of West Georgia, USA*

Chapter 4.14. Reaching Beyond Bricks and Mortar: How Sylvan Online Expands Learners’ Options .......................................................................................................................... 962
*Saul Rockman, Rockman et al., USA
Lynn Fontana, Sylvan Learning, USA*

Chapter 4.15. Some Key Success Factors in Web-Based Corporate Training in Brazil ................. 975
*Luiz Antonio Joia, Brazilian School of Public and Business Administration of Getulio Vargas Foundation and Rio de Janeiro State University, Brazil*

Chapter 4.16. Delivery of a Social Science Online Program in India ............................................. 995
*Shobhita Jain, Indira Gandhi National Open University, New Delhi, India*

Chapter 4.17. Integrating Classroom and Online Instruction in an Introductory American Government Course ................................................................. 1006
*Richard Engstrom, Georgia State University, USA*

Chapter 4.18. Teaching Criminology and Police Science for Postgraduate Students at the Ruhr-University Bochum, Germany ............................................ 1019
*Diana Ziegleder, Ruhr-University Bochum, Germany
Felix Feldmann-Hahn, Ruhr-University Bochum, Germany*

Chapter 4.19. Blending Classroom Activities with Multi-User Virtual Environment for At-Risk Primary School Students in an After-School Program: A Case Study ............. 1036
*Lee Yong Tay, Beacon Primary School, Singapore
Cher Ping Lim, Edith Cowan University, Western Australia*

Chapter 4.20. E-Learning Practice and Experience at Waseda E-School: Japan’s First Undergraduate Degree-Awarding Online Program ............................................. 1055
*Shoji Nishimura, Waseda University, Japan
Douglas J. Scott, Waseda University, Japan
Shogo Kato, Waseda University, Japan*

Chapter 4.21. Web-Based Implementation of the Personalised System of Instruction: A Case Study of Teaching Mathematics in an Online Learning Environment ......................... 1075
*Willem-Paul Brinkman, Brunel University, UK
Andrew Rae, Brunel University, UK
Yogesh Kumar Dwivedi, Swansea University, UK*
Chapter 4.22. Autism and Family Interventions through Technology: A Description of a Web-Based Tool to Educate Fathers of Children with Autism

Richard E. Ferdig, Kent State University, USA
Hilary G. Amberg, University of Florida, USA
Jennifer H. Elder, University of Florida, USA
Susan A. Donaldson, University of Florida, USA
Gregory Valcante, University of Florida, USA
Roxanna Bendixen, University of Florida, USA

Section V. Organizational and Social Implications

This section includes a wide range of research pertaining to the social and organizational impact of Web-based education. Chapters included in this section analyze the social psychology of online collaborative learning, provide guidelines for synchronous and asynchronous teaching in Web-based courses, discuss classroom management in Online courses, and present various student and faculty perspectives and experiences with online learning software. The inquiries and methods presented in this section offer insight into the implications of Web-based education at both a personal and organizational level, while also emphasizing potential areas of study within the discipline.

Chapter 5.1. Perspectives on the Realities of Virtual Learning: Examining Practice, Commitment, and Conduct

Kristina K. Carrier, University of Idaho, USA

Chapter 5.2. Bothering with Technology: Building Community in an Honors Seminar

John J. Doherty, Northern Arizona University, USA

Chapter 5.3. The Social Psychology of Online Collaborative Learning: The Good, the Bad, and the Awkward

Donna Ashcraft, Clarion University of Pennsylvania, USA
Thomas Treadwell, West Chester University, USA

Chapter 5.4. Student and Faculty Use and Perceptions of Web 2.0 Technologies in Higher Education

Haya Ajjan, University of North Carolina at Charlotte, USA
Richard Hartshorne, University of North Carolina at Charlotte, USA
Richard E. Ferdig, Kent State University, USA

Chapter 5.5. What Factors Promote Sustained Online Discussions and Collaborative Learning in a Web-Based Course?

Xinchun Wang, California State University, USA

Chapter 5.6. Fostering Successful Learning Communities to Meet the Diverse Needs of University Students

Silvia L. Braidic, California University of Pennsylvania, USA
Chapter 5.7. Framing Pedagogy, Diminishing Technology: Teachers Experience of Online Learning Software

Julia Thornton, RMIT University, Australia

Chapter 5.8. Humanizing Learning-at-Distance: Best Practice Guidelines for Synchronous Instructors

Kathleen Barclay, University of Phoenix School of Advanced Studies, USA

Chapter 5.9. Herding Cats: Striking a Balance Between Autonomy and Control in Online Classes

Donald N. Philip, University of Toronto, Canada

Chapter 5.10. Factors Influencing Students Intention to Take Web-Based Courses in a College Environment

Hamid Nemati, University of North Carolina at Greensboro, USA
Marcia Thompson, University of North Carolina at Greensboro, USA

Chapter 5.11. Classroom Preferences: What Factors can Affect Students’ Attitudes on Different Classroom Settings?

Chuleeporn Changchit, Texas A&M University-Corpus Christi, USA
Tim Klaus, Texas A&M University-Corpus Christi, USA

Chapter 5.12. Learning With Online Activities: What Do Students Think About Their Experience?

Salam Abdallah, Abu Dhabi University, UAE

Chapter 5.13. A Case Study of the Adult Learner’s Perception of Instructional Quality in Web-Based Online Courses

Terry T. Kidd, University of Houston-Downtown, USA
Holim Song, Texas Southern University, USA

Section VI. Managerial Impact

This section presents contemporary coverage of the managerial implications of Web-based learning technology. Particular contributions address the cost of implementing e-learning courses and support on a traditional campus, and how to best address institutional factors that might impede adoption of e-learning technology. The managerial research provided in this section allows administrators, practitioners, and researchers to gain a better sense of how Web-based education systems can inform their practices and behavior.

Chapter 6.1. Fulfilling the Promise: Addressing Institutional Factors that Impede the Implementation of E-Learning 2.0

Judi Repman, Georgia Southern University, USA
Cordelia Zinskie, Georgia Southern University, USA
Elizabeth Downs, Georgia Southern University, USA
Chapter 6.2. Issues in Implementing Online Education in a Developing Country................................. 1342
Tim Bristol, Crown College, USA

Chapter 6.3. Costs of E-Learning Support: An Investigation Across 139 Small Projects..................... 1347
Paul Lam, The Chinese University of Hong Kong, Hong Kong
Josephine Csete, The Hong Kong Polytechnic University, Hong Kong
Carmel McNaught, The Chinese University of Hong Kong, Hong Kong

Chapter 6.4. E-Learning University Networks: An Approach to a Quality Open Education....................... 1362
Elena Verdú Pérez, CEDETEL, Spain
Maria Jesús Verdú Pérez, Universidad de Valladolid, Spain

Chapter 6.5. An Evaluation of Blending Technology with Pedagogy for Teaching Educators and its Implication for their Classroom Teaching ................................................................. 1376
Carol Kahan Kennedy, Fordham University, USA
Maureen Hinkley, Fairfield University, USA

Chapter 6.6. Cost Effectiveness in Course Redesign: The Transformation Toward E-Learning......... 1392
David Kendrick, University of Northern Colorado, USA

Section VII. Critical Issues

This section addresses conceptual and theoretical issues related to the field of Web-based education, which include issues related to instruction, collaboration, and academic integrity. Within these chapters, the reader is presented with analysis of the most current and relevant conceptual inquire within this growing field of study. Particular chapters address the impact of a student code on distance learning classrooms, the use of blogs in Web-based educational projects, the role of orientation materials in online courses, and various methods to promote collaborative effort among students. Overall, contributions within this section ask unique, often theoretical questions related to the study of Web-based learning technologies and, more often than not, conclude that solutions are both numerous and contradictory.

Chapter 7.1. Adult Learners, E-Learning, and Success: Critical Issues and Challenges in an Adult Hybrid Distance Learning Program................................................................. 1400
Jeffrey Hsu, Fairleigh Dickinson University, USA
Karin Hamilton, Fairleigh Dickinson University, USA

Chapter 7.2. Instructor Presence in Online Distance Classes ............................................................. 1422
Janet Lear, University of Nebraska at Kearney, USA

Chapter 7.3. Collaborative Work in Online Learning Environments: Critical Issues, Dynamics, and Challenges ......................................................................................................................... 1428
Erman Yukselturk, Middle East Technical University, Turkey
Kursat Cagiltay, Middle East Technical University, Turkey
Chapter 7.4. A Pedagogical Approach to the Design of Learning Objects for Complex Domains
Emanuela Busetti, Istituto di Matematica Applicata e Tecnologie Informatiche del CNR, Italy
Giuliana Dettori, Istituto di Matematica Applicata e Tecnologie Informatiche del CNR, Italy
Paola Forcheri, Istituto di Matematica Applicata e Tecnologie Informatiche del CNR, Italy
Maria Grazia Ierardi, Istituto di Matematica Applicata e Tecnologie Informatiche del CNR, Italy

Chapter 7.5. Web-Based Collaboration and Decision Making Support: A Multi-Disciplinary Approach
Nikos Karacapilidis, University of Patras, Greece
Manolis Tzagarakis, University of Patras, Greece

Chapter 7.6. Teaching Dimension in Web-Based Learning Communities
Francesca Pozzi, Istituto Tecnologie Didattiche – CNR, Italy

Chapter 7.7. Culture and Language Learning in Computer-Enhanced or Assisted Language Learning
Bolanle A. Olaniran, Texas Tech University, USA

Panagiotis Zaharias, University of the Aegean, Greece

Chapter 7.9. Metacognition for Enhancing Online Learning
Giuseppe Chiazzese, Italian National Research Council, Italy
Antonella Chifari, Italian National Research Council, Italy
Gianluca Merlo, Italian National Research Council, Italy
Simona Ottaviano, Italian National Research Council, Italy
Luciano Seta, Italian National Research Council, Italy

Chapter 7.10. Redefining Web Users’ Optimal Flow Experiences in Online Environments: An Empirical Analysis
Anshu Saxena Arora, Savannah State University-Savannah, USA
Mahesh S. Raisinghani, TWU School of Management, USA

Chapter 7.11. “Virtual Inquiry” in the Science Classroom: What is the Role of Technological Pedagogical Content Knowledge?
Eva Erdosne Toth, West Virginia University, USA

Chapter 7.12. Blogging Minds on Web-Based Educational Projects
Harrison Hao Yang, State University of New York at Oswego, USA

Chapter 7.13. The Perfect Blend?: Online Blended Learning from a Linguistic Perspective
Roberto Di Scala, University of Modena and Reggio Emilia, Italy
Chapter 7.14. Do Orientation Materials Help Students Successfully Complete Online Courses?
Lawrence A. Tomei, Robert Morris University, USA
Holly Hagle, Robert Morris University, USA
Ashley Rineer, Robert Morris University, USA
Lisa A Mastandrea, Robert Morris University, USA
Jennifer Scollon, Regis University, USA

Chapter 7.15. Did We Become a Community? Multiple Methods for Identifying Community and Its Constituent Elements in Formal Online Learning Environments
Richard A. Schwier, University of Saskatchewan, Canada
Ben K. Daniel, University of Saskatchewan, Canada

Chapter 7.16. When Distance Technologies Meet the Student Code
Peg Wherry, Montana State University, USA
Deborah Lundberg Windes, University of Illinois at Urbana-Champaign, USA

Chapter 7.17. Web Accessibility Policy for Students with Disabilities in U.S. Postsecondary Distance Education
Heidi L. Wilkes, Northeastern University, USA

Chapter 7.18. The Impact of Sociocultural Factors in Multicultural Communication Environments: A Case Example from an Australian University’s Provision of Distance Education in the Global Classroom
Angela T. Ragusa, Charles Sturt University, Australia

Section VIII. Emerging Trends

This section highlights research potential within the field of health information systems while exploring uncharted areas of study for the advancement of the discipline. Chapters within this section highlight new trends in digital e-learning environments, mobile technology as an e-learning tool, and the use of Web 2.0 in the classroom. These contributions, which conclude this exhaustive, multi-volume set, provide emerging trends and suggestions for future research within this rapidly expanding discipline.

Chapter 8.1. Emerging Frontiers of Learning Online: Digital Ecosystems, Blended Learning and Implications for Adult Learning
Glenn Finger, Griffith University, Australia
Pei-Chen Sun, National Kaohsiung Normal University, Taiwan
Romina Jamieson-Proctor, University of Southern Queensland, Australia

Chapter 8.2. Wired for Learning—Web 2.0 for Teaching and Learning: Trends, Challenges, and Opportunities for Education
Irene Chen, University of Houston-Downtown, USA
Terry T. Kidd, Texas A&M University, USA
Chapter 8.3. New Functions for Stimulating Learners’ Motivation in a Web-Based e-Learning System

Keita Matsuo, Fukuoka Institute of Technology, Japan
Leonard Barolli, Fukuoka Institute of Technology, Japan
Fatou Xhafa, Polytechnic University of Catalonia, Spain
Akio Koyama, Yamagata University, Japan
Arjan Durresi, Indiana University Purdue University, USA

Chapter 8.4. A Changed Economy with Unchanged Universities? A Contribution to the University of the Future

Maria Manuela Cunha, Polytechnic Institute of Cavado and Ave, Portugal
Goran D. Putnik, University of Minho, Portugal

Chapter 8.5. Web-Based Video for E-Learning: Tapping into the YouTube™ Phenomenon

Chareen Snelson, Boise State University, USA

Chapter 8.6. E-Learning 2.0: Web 2.0, the Semantic Web and the Power of Collective Intelligence

Chaka Chaka, Walter Sisulu University, South Africa

Chapter 8.7. A Rough Set Based Approach to Find Learners’ Key Personality Attributes in an E-Learning Environment

Qinghua Zheng, Xi’an Jiaotong University, China
Xiyuan Wu, Xi’an Jiaotong University, China
Haifei Li, Union University, USA

Chapter 8.8. Web-Based Education Accountability System and Organisational Changes: An Actor-Network Approach

Xueguang Ma, University of Maryland, USA
Roy Rada, University of Maryland, USA

Chapter 8.9. Development of a Web-Based System for Diagnosing Student Learning Problems on English Tenses

Gwo-Jen Hwang, National University of Tainan, Taiwan
Hsiang Cheng, National Chi Nan University, Taiwan
Carol H.C. Chu, National Chi Nan University, Taiwan
Judy C.R. Tseng, Chung-Hua University, Taiwan
Gwo-Haur Hwang, Ling Tung University, Taiwan

Chapter 8.10. Mobile e-Learning for Next Generation Communication Environment

Tin-Yu Wu, I-Shou University, Taiwan
Han-Chieh Chao, National Dong Hwa University, Taiwan
Chapter 8.11. The eLogBook Framework: Sustaining Interaction, Collaboration, and Learning in Laboratory-Oriented CoPs
Yassin Rekik, École Polytechnique Fédérale de Lausanne (EPFL), Suisse
Denis Gillet, École Polytechnique Fédérale de Lausanne (EPFL), Suisse
Sandy El Helou, École Polytechnique Fédérale de Lausanne (EPFL), Suisse
Christophe Salzmann, École Polytechnique Fédérale de Lausanne (EPFL), Suisse

Chapter 8.12. A Novel Architecture for E-Learning Knowledge Assessment Systems
Krzysztof Gierłowski, Gdansk University of Technology, Poland
Krzysztof Nowicki, Gdansk University of Technology, Poland