# Table of Contents

Preface .................................................................................................................................................................................. xi
List of Chairs, PC Members and Additional Reviewers ........................................................................................................... xiii

## Track: Educational needs and technological solutions

Leveraging Short-Lived Learning Networks to Encourage Collaborative Peer Learning ....................................................... 1
  *Jack Fernando Bravo-Torres, Pablo Esteban Andrade-Rea, Paúl Esteban Vintimilla-Tapia, Esteban Fernando Ordoñez-Morales, Martín López-Nores and Yolanda Blanco-Fernández*

Exercise specification for collaboration, reusing and automatically generating evaluations .................................................... 8
  *Omar Gil, Regina Motz and Ezequiel Sanchez*

Implementation of Software Quality Control in E-Learning development projects: TEC Digital ........................................ 12
  *Krissia Gómez-Román and Ederick Navas*

Identifying Significant Implications using Computational Support .......................................................................................... 20
  *Patricia Rios, Camila Z. Aguiar and Davidson Cury*

Integrating academic analytics for supporting accreditation and international cooperation: TEC and UABCS experience .................................................................................................................. 27
  *Mario Chacon, Agustín Francesca-Alfaro, Jesús Andrés Sandoval and Mónica Carreño*

Model for teacher training in higher education: towards a collaborative Bank of rubrics ...................................................... 34
  *Julia Espinoza Guzman, Pablo Gamboa Camacho and Mario Chacón-Rivas*

Experience of a didactic tool as a support in the learning of relational algebra ................................................................ 38
  *J. Andrés Sandoval Bringas, Mónica A. Carreño León, Alejandro Leyva Carrillo and Italia Estrada Cota*

## Track: Personalized Learning, Adaptability and Accessibility

Fuzzy Method of Evaluation of Instructionals Techniques Based on Learning Styles: FuzzyILS-Instruction .......................................................... 42
  *Antonio Silva Sprock, Julio Cesar Ponce Gallegos and Rosa María Vicari*

Identification and systematization of indicatives and data mining techniques for detecting evasion in distance education .......................................................... 49
  *Dirlene Silva, Simone Martins and Cristiano Maciel*

The presence of TIC in the teaching-learning process of youth and adults with Down syndrome: The game as didactic-pedagogical resource ........................................................................................................ 57
  *Gustavo De Oliveira Andrade, Sérgio Adriany Santos Moreira, Neila Santos Brandão and Maria Paula Pinto Dos Santos Belcavello*

Learning styles comparison based on a classification methodology ......................................................................................... 64
  *Jacqueline Solís-Céspedes and Julia Espinoza-Guzman*

An Analysis on Student Profiles in Learning Virtual Environments ......................................................................................... 71
Janalivia Carneiro, Danielle R. D. Da Silva and Clauriton A. Siebra
Teaching Programming to Kids in Situation of Social Vulnerability ................................................................. 79
Ivana Harari and Viviana Harari
E-Rural methodology: Contents elaborated according to the literacy level of the target audience.................... 87
Vanessa Maia Aguiar de Magalhaes, William Fernandes Bernardo, Fábio Homero Diniz, Katia Lage Santos, Sandra Maria Aluisio, Sidney Leal and Leonardo Mariano Gravina Fonseca
Clustering Learning Objects in the IEEE-LOM Standard Considering Learning Styles to Support Customized Recommendation Systems in Educational Environments ......................................................... 96
Miller M. Mendes, Victor C. Carvalho, Rafael D. Araújo, Fabiano A. Dorça and Renan G. Cattelan
A Recommender System of Open Educational Resources based on the Purpose of Learning....................104
Klinge Villalba, Sonia Castro Cuba, Claudia Deco, Cristina Bender and Francisco J. García-Peñalvo
Comparative analysis of similarity metrics for the collaborative recommendation of learning objects........................................................................................................................................... 108
Luis Felipe Londoño Rojas, Paula Andrea Rodríguez Marin and Néstor Dario Duque Méndez
Programming Technologies for Social Inclusion: An experience in professional development with elementary teachers....................................................................................................... 112
Natalia Monjelat
Detecting Synonyms in Concept Map as Support for Learning Assessment ..................................................120
Ramon Azeredo, Camila Aguiar, Wagner Perin, Davidson Cury and Marcos Lovati
The Deaf Student Motivation in a Gamified Comics Learning Object ......................................................... 124
Raul Inacio Busarello and Vania Ribas Ulbricht
The Think Aloud Method for Qualitative Evaluation of an Intelligent Tutoring System Interface .....128
Felipe de Morais, Bruno Luis Schaab and Patricia Jaques
ValpoDijo: Developing a Software that Supports the Teaching of Chilean Idioms to Children with Autism Spectrum Disorders........................................................................................................ 136
Camila Alvarado, Roberto Muñoz, Rodolfo Villarroel, Oscar Acuña, Thiago S. Barcelos and Carlos Becerra
Semantic Retrieval of Learning Objects Based on Portuguese Language Thesauri................................. 140
Josivan Pereira Da Silva and Ismar Frango Silveira
Track: Games, Virtual and Augmented Reality
Evaluation of Usability and User Experience regarding the Gamification of Educational Systems......144
Ana Carolina Tomé Klock, Eduardo J. de Borba, Isabela Gasparini, Daniel Lichtnow, Marcelo Pimenta and Guillermo Rodriguez
Discrete event simulation for student flow in academic study periods.........................................................152
Angel Fiallos and Xavier Ochoa
What Where?: A game for learning art, history and architecture ................................................................. 159

Beatriz Pacheco, Werner Marin, Bruno Cruz, Vinicius Miana, Ilana Souza-Concilio, Joaquim Pessoa Filho and Pedro Henrique Braga

Environment for Students Performance Monitoring through a Digital Game for Teaching Mathematics ................................................................. 163

Leandro Fernandes Da Mota and Edson Pinheiro Pimentel

The production of learning objects with accessibility for people with disabilities from strategies of gamification and transmedia storytelling .......................................................................................... 167

Leonardo Enrico Schimmelpfeng, Graziela de Souza Sombrio, Vania Riba Ulbricht, Luciane Fadel and Claudia Regina Batista Claudia Regina Batista

Implementation of an Chatbot in a Serious Game associated with the acquisition of social skills and the promotion of collaborative tasks in children ................................................................................. 171

Adriana Mansilla, Alberto Ochoa, Julio Ponce, Marcela Herrera, Alberto Hernandez and Edgar Cossio

Track: Learning Analytics

An Initial Review of Learning Analytics in Latin America .................................................................................. 175

Henrique Lemos Dos Santos, Cristian Cechinel, João Batista Carvalho Nunes and Xavier Ochoa

Comparing students and professors impressions about the use of forums and chats during a distance learning discipline ........................................................................................................................................ 184

Henrique Santos and Cristian Cechinel

Smart Objects for Engineering Labs: Boosting Exploratory Learning in Higher Education ......................................................... 191

Hernán Ullón, Dick Zambrano and Federico Domínguez

Latin-American Network of Learning Analytics - LALA ................................................................................. 198

Antonio Silva Sprock, Rosa María Vicari, Mónica Rojas Rincón, Ismar Frango Silveira, Julio Ponce Gallegos, Jorge Maldonado and Angelica Toscano

Track: Educational research and technology

Organizing Tutorial Lessons: Challenges and Perspectives .................................................................................. 202

Vinicius Ramos, Arthur Oliveira Da Silva and Marina Bazzo de Espíndola

Agent-based Approach to Support the Construction of Concept Maps .................................................................................. 206

Wagner Gaspar, Davidson Cury and Camila Z. Aguiar

Towards a virtual proposal of Inquiry-Based Learning for the acquisition of scientific competencies in seventh grade .................................................................................................................. 210

Alejandra Peláez-Ruiz and Alberto Piedrahita-Ospina

Creative Monument Towards mediated educational practices for the socialization of heritage ......................................................... 214

Patricia Silvana San Martín and Guillermo Luján Rodríguez

A proposal for the teaching of 3D printing technologies based on The Teaching for Understanding Framework ......................................................................................................................... 218

Daniel Diaz Araya, Sandra Oviedo and Alejandra Otazú
Electronic Puppet: development of an Assistive Educational Technology ........................................................... 222
  Roceli Lima, Magda Bercht, Liliana Passerino, Rafael Martins Farias, Guilherme Linck de Vasconcellos and Renato Ventura B. Henriques

**Track: Learning Object Repositories**

Mexican Standard for Interoperability of Learning Objects Environments ............................................................. 226
  Lorena Castro-García, Gabriel López-Morteo and Araceli Justo-López

Marrakech Treaty: impacts of its implementation on repositories and accessible resources..................................... 234
  Patricia Díaz, Virginia Rodés Paragarino and José Antonio Villamil Negrín

Towards a Model of Adaptive and Accessible Repositories of Digital Educational Resources: FROAC case .................................................................................................................... 242
  Valentina Tabares Morales, Néstor Darío Duque Méndez and Luis Felipe Londoño Rojas

**Track: Learning Objects and Open Educational Resources**

Pilas Bloques: a Scenario-Based Children Learning Platform .......................................................................................... 247
  Alfredo Sanzo, Fernando Schapachnik, Pablo Factorovich and Federico Sawady O’Connor

Quality and Tests for Open Educational Resources A Systematization based on Software Engineering Principles .................................................................................................................. 253
  Douglas Almendro and Ismar Frango Silveira

Network Analysis Software for Diagramming Arguments in Informal Logic Classes .................................................. 260
  Federico Ferrero, Adriana Gewerc and Diego Letzen

Fazenda 3D Evaluation of a virtual Environment for farming technical education ..................................................... 267
  Érika Cristina Dias de Oliveira Brelaz, Ilmara Monteverde Martins Ramos, Dárice Machado Da Silva, Hérick Pimentel Ferreira and David Brito Ramos

**Track: Educational research and technology**

Analyzing the Evolution of Learning Technology Area using Science Mapping ......................................................... 271
  Claudia Deco, Ana Casali, Regina Motz and Cristina Bender

TEACHER TRAINING FOR THE CREATION OF ACCESSIBLE COURSES AT ATUTOR ........................................ 279
  Fernando Martínez Rodríguez

MLMS: Mini Learning Management System for schools without internet connection .............................................. 287
  Manuel Ibarra, Carlos Huaraca, Wilfredo Soto and Carmen Palomino

Wollok: language + IDE for a gentle and industry-aware introduction to OOP .............................................................. 294
  Nicolas Passerini, Carlos Lombardi, Javier Fernandes, Pablo Tesone and Fernando Dodino

**Track: Mass Online Open Courses (MOOCs)**

Flipping the Classroom with MOOCs. A Pilot Study Exploring Differences between Self-Regulated Learners .................................................................................................................. 298
Jorge Maldonado-Mahauad, Mar Pérez-Sanagustín, Jorge Luis Bermeo Conto, Lissete Muñoz, Guillermo Pacheco and Isabel Espinoza

Discovering the MOOC Information System Generic Architecture .......................................................... 306

Malhena Sánchez and Juan Pablo Carvallo

Model of Usability Engineering Results and implications to MOOCs ..................................................... 314

Lourdes Margain, Carlos Alejandro De Luna-Ortega and Francisco Javier Alvarez

Track: Learning Objects and Open Educational Resources

Strategies for implementation of Virtual Learning Objects in Higher Education. Case of study: Faculty of Humanities, University of San Carlos of Guatemala –USAC- ............................................................... 318

Luis Magdiel Oliva Córdova

The Use of Learning Objects in the Academic Adequacy in an Object-Oriented Programming Course for a Blind Student ..................................................................................................................................... 326

Gabriela Capel, Diego Torres and Juan Ignacio Vidal

Learning Object Assembly Systems. A case study ...................................................................... 330

Gustavo Javier Astudillo, Cecilia Verónica Sanz and Liliana Patricia Santacruz-Valencia

EduTools – Authoring Tool for creating HTML Learning Objects ....................................................... 334

Juan Sebastian Espinosa Trejos, Emily Juliana Hernández Leal and Néstor Darío Duque Méndez

PseudoRandom. A proposal of educational material for Pseudorandom Number Generators learning .................................................................................................................................... 338

Verónica Laura Vanoli and María Paula Dieser

Authoring Tool for Making Learning Objects about Coding Tests in Computer Programming Courses .......................................................................................................................................................... 342

Mateo Hernández, Julian Moreno and Néstor D. Duque Méndez

Design of a Learning Object for Simulation based on Emerging Pedagogies ........................................ 346

Nevelin Irene Salazar and Elena Beatriz Durán

HEALTH EDUCATION: proposal to develop a Learning Object to combat the Zika virus................. 350

Gustavo De Oliveira Andrade, Vera Maria Benjamim Werneck and Luciana Branco Da Motta

Learning Objects developing Framework based on a Knowledge Management strategy known as Community Practice (CoP) .................................................................................................................................. 354

Juan Pedro Cardona Salas, César Eduardo Velázquez Amador, Jaime Muñoz-Arteaga, Guillermo Domínguez and Angel Eduardo Muñoz Zavala

Track: Mobile Learning, Educational Television and Ubiquitous Learning

Location-based Mobile Learning Applications: A conceptual framework for co-design ........................ 358

Alejandra B. Lliteras, Cecilia Challiol and Silvia E. Gordillo
T-MindMap: a Distance Education Forum as a Mental Map via Digital TV ................................................. 366
Jardel Ribeiro de Lima and Mario Godoy Neto

Track: Games, Virtual and Augmented Reality

Construction of learning objects with Augmented Reality: an experience in secondary education .... 370
Emilcy Juliana Hernández Leal, Néstor Dario Duque Méndez, Mauricio Giraldo Ocampo and Paula Andrea Rodríguez Marín

The native cultures through Rácés. A video game as a didactic-cognitive resource ....................... 377
Laura Fava, Claudia Banchoff, Luciano Nomdedeu and Sofia Martin

A platform for the stimulation of holistic learning in the teaching of Odontology .......................... 384
Jack Fernando Bravo-Torres, Paúl Esteban Vintimilla-Topia, Pablo Leonidas Gallegos-Segovia, Cinthya María Cevallos-Ludeña, Andrés Iván Palacios-Astudillo and María De Lourdes León-Vintimilla

Track: Competition of Learning Object and/or Educational Applications

ConCIErNCIA Estadística-An educational material to approach statistics as a tool for science ........................................................................................................................................ 388
Maria Paula Dieser

GEOMEKids: Educational Application for Teaching of Figures and Geometric Bodies in Kindergarten .......................................................... 392
Yesica Chirinos Delfino

Learning Object for the understanding of the operation merge .......................................................... 396
Verónica Artola and Cecilia Sanz

Learning Object Seguridade Virtual: Developing critical thinking to safe use of the Internet .......................................................... 400
Leticia Machado, Jozelina Mendes, Bruna Sloodowski, Larissa Justin, Anderson Saldanha, Deyse Sampaio, Laura Krimberg, Tassia Grande, Johannes Doll and Patricia Behar

Learning Objects: How to insert an element into a vector? ................................................................. 404
María Lucía Violini and Cecilia Verónica Sanz

Bilingual and accessible Virtual Learning Environment ........................................................................ 408
Elisá Maria Pivetta, Daniela Satomi Saito, Vania Ribas Ulbricht and Ana Margarida Pisco Almeida

SECav. Educational Software for Numerical Calculus ........................................................................ 412
M. E. Ascheri, Ruben Pizarro and Gustavo Astudillo