

TABLE OF CONTENTS

My Personal Brand and My Web Presence: Mining Digital Footprints and Analyzing Personas in the World of IOT and Digital Citizenry.	1
<i>Fawzi BenMessaoud, Indiana University and Purdue University, United States; Taryn Elizabeth Hust, Dwight William Hall, Holly Nichole Handlon & Niranjana Valmik Kshirsagar, Indiana University & Purdue University, United States</i>	
NEWTON Fab Lab Initiative: A Small-Scale Pilot for STEM Education	8
<i>Mohammed Amine Togou, Dublin City University, Ireland; Covadonga Lorenzo & Gianluca Cornetta, CEU San Pablo University, Spain; Gabriel-Miro Muntean, Dublin City University, Ireland</i>	
Collaborative AR application design for early childhood education	18
<i>Chrisna Botha-Ravyse, Phasrec, North-West UniversityTurku University of Applied Sciences, South Africa; Antti Lähtevänoja, University of Jyväskylä, Finland; Mika Luimula, Turku University of Applied Sciences, Finland</i>	
Utilizing Online Collaboration to Enhance Learners' Social Emotional Competencies	28
<i>Li-Ling Chen, California State University at East Bay, United States</i>	
Using 3D printing for curriculum enhancement	32
<i>Patricia Fidalgo & Ieda M. Santos, Emirates College for Advanced Education, United Arab Emirates; Luisa Menano, Marionete, United Kingdom; Joan Thormann, Lesley University, United States</i>	
Analysis and analysis of application for arranging/grouping/structuring children's information which utilized on tablet PC	36
<i>Hitoshi Nakagawa, The Open University of Japan, Japan; Masuo Murai, Hokuriku Gakuin University, Japan; Yukie Sato, Kanazawa Seiryō University, Japan; Yuki Kobayashi, Ibaraki University, Japan; Hironori Suzuki & Junichi Morishita, Suzuki Educational Software Co.,LTD., Japan</i>	
Best of Germany: Interactive Online Modules as a Digital Support for Students in the Introductory Phase of Civil Engineering Studies	40
<i>Marcel Pelz, Martin Lang, Yasemin Özmen & Jörg Schröder, University of Duisburg-Essen, Germany; Felix Walker & Ralf Müller, Technical University of Kaiserslautern, Germany</i>	
Usage of Design Thinking for soft skills development	49
<i>Elvira Strakhovich, Graduate School of Management Saint-Petersburg University, Russian Federation</i>	
Best of Germany: Smartglasses as Assistive Tools for Higher Science Education: Towards a Descriptive Model of AR-based Science Laboratories	53
<i>Michael Thees & Sebastian Kapp, Technische Universität Kaiserslautern, Germany; Paul Lukowicz, German Research Center for Artificial Intelligence (DFKI), Germany; Jochen Kuhn, Technische Universität Kaiserslautern, Germany</i>	

SpellLit: A Collaborative Body- and Space-related Interactive Learning Game for School Children to acquire Reading and Writing Skills	63
<i>Thomas Winkler, Deniz Akyildiz & Michael Herczeg, University of Luebeck, IMIS, Germany</i>	
A Novel Way to Measure Executive Functions in Primary School Students in an Engaging, Child-Friendly and Valid Way.	72
<i>Valeska Berg, Mark McMahon & Shane Rogers, Edith Cowan University, Australia; Michael Garrett & Dominic Manley, Cinglevue International, Australia</i>	
The eFun App: A New Tool to Measure Executive Functions to Support Learning in a Child-Friendly, Valid and Engaging Way.	76
<i>Valeska Berg, Mark McMahon & Shane Rogers, Edith Cowan University, Australia; Michael Garrett & Dominic Manley, Cinglevue International, Australia</i>	
Assessment Skills and Validity of Peer- and Self-Assessment in In-Service Teacher Training	86
<i>Graziano Cecchinato & Laura Carlotta Foschi, University of Padova, Italy</i>	
Is it worth the trouble: does smart, intentionally designed student learning environments increase student participation?	92
<i>Koos De Villiers & Gordon Matthew, North-West University, South Africa</i>	
Looking for the Optimal Interactivity Level in the AlgoRythmics Learning Environment	106
<i>Eszter Jáhel Nagy, Pálma Rozália Osztián, Cristian Cosma, Zoltán Kátai & Erika Osztián, Sapientia Hungarian University of Transylvania, Romania</i>	
Ameliorating Plagiarism Across Countries and the K-20 Continuum	115
<i>Michael-Brian Ogawa, University of Hawaii, United States; Kay Sundberg, Karolinska Institutet, Sweden</i>	
Best of Germany: How Are Students' Digital Media Behaviour and Self-Efficacy Related to Academic Achievement?	121
<i>Marina Isabel Pumptow & Taiga Brahm, Eberhard Karls Universität Tübingen, Germany</i>	
The process of instructor orientation and socialization to the Moodle LMS in a post secondary context.	132
<i>Mark Zieber, University of Lethbridge, Canada</i>	
Digital Citizenry and Personal Branding: An IoT Data Function	141
<i>Fawzi BenMessaoud & Niranjana Valmik Kshirsagar, Indiana University and Purdue University, United States; Holly Handlon, Dwight Hall & Taryn Husted, Indiana University & Purdue University, United States</i>	

Effect of ePortfolio for Goal Setting on Self-Regulated Learning in Computer Course	148
<i>Chi-Cheng Chang, National Taiwan Normal University, Taiwan; Yueh-Mai Liao, Yifeng Senior High school, Taiwan</i>	
Best of Germany: VorleXung: Cross-linking Recitation Sessions and Physics Lectures using eXperiment-based Video-Analysis Tasks	152
<i>Stefan Küchemann, Pascal Klein & Jochen Kuhn, Technische Universität Kaiserslautern, Germany</i>	
Creating ePortfolios as Components of Undergraduates Employability Toolkit	158
<i>Gabrielle Read Jasnoff, Transylvania University, University of Louisville, United States; Amy Sheikh, Transylvania University, Temple University, United States</i>	
Robots at School: Supporting Humanities Teaching Through Robots-Based Storytelling	162
<i>Flor Angela Bravo & Enrique Gonzalez, Pontificia Universidad Javeriana, Colombia; Nicoletta Di Blas & Andrea Bonarini, Politecnico di Milano, Italy</i>	
Reflective thinking in reading guided by augmented reality	176
<i>Lih-Juan ChanLin, Fu Jen Catholic University, Taiwan</i>	
Best of Austria: Developing Video Games in Secondary Schools with Unity	181
<i>Oswald Comber, Renate Motschnig, Hubert Mayer & Matthias Hörbe, University of Vienna, Austria</i>	
OER and Flipped Classroom – Do they match?	190
<i>Elke Höfler, University of Graz, Austria; Josef Buchner, St. Gallen University of Teacher Education, Switzerland</i>	
Application of Augmented Reality Apps for the Enhancement of a Community Science Drought Monitoring Project	199
<i>Ayodeji Ibukun, Thanh Do, Sarinporn Chaivisit, Tutaleni Asino & Nicole Colston, Oklahoma State University, United States</i>	
Elementary School Students' Perceptions of Using Student Response Systems	204
<i>Robin Kay, University of Ontario Institue of Technology, Canada</i>	
The Impact of collaborative writing on Learning English	209
<i>Pei-Lin Liu & Chiu Jung Chen, National Chiayi University, Taiwan</i>	

Evaluating e-learning system for English conversation practice with speech recognition and future development using AI	213
<i>Makoto Shishido, Tokyo Denki University, Japan</i>	
There is No App for That: Developing Educational Apps through a Cross-Disciplinary Course	219
<i>Marlo Steed, Faculty of Education, University of Lethbridge, Canada</i>	
Mobile Learning: Investigating Unique Strategy Use	225
<i>Ewa Wasniewski & Patricia Boechler, University of Alberta, Canada</i>	
Creating Augmented Realities in the Context of Lessons in Secondary Schools	230
<i>Thomas Winkler, University of Luebeck, IMIS, Germany; Alexander Ohlei, IMIS, University of Luebeck, Germany; Martina Ide, KHI, Gustav-Albrechts-University of Kiel, Germany; Michael Herczeg, IMIS, University of Luebeck, Germany</i>	
Development of online experiments for science education by master of education students using a low-cost and easy approach	248
<i>Momo Chang Xu, Jingjing Wang, Oliver Chan, Ken Chi-Keung Chan & Yau-yuen Yeung, The Education University of Hong Kong, China</i>	
Overview on mobile learning with learning analytical support	253
<i>Jane Yau, University of Mannheim, Germany</i>	
Suggestopedic Mobile Language Learning	257
<i>Jane Yau, University of Mannheim, Germany; Mike Joy, University of Warwick, United Kingdom</i>	
Educational use of an innovative mobile logger and evaluation of students' learning effectiveness in STEM education	261
<i>Yau-yuen Yeung, Yuanyuan Wang, Lit-Hong Lee, Hang-Chi Lee, Ken Chi-Keung Chan & Frank Chi-Chiu Cheang, The Education University of Hong Kong, Hong Kong</i>	
“I opened a group for myself, to keep my data...”: Personal Information Management and Usage Patterns on WhatsApp	268
<i>Alona Forkosh Baruch, Levinsky College of Education, Tel Aviv University, Israel; Lilach Alon, Tel Aviv University, Israel</i>	
Students' views on the use of Facebook as an online learning management system in a module in higher education	277
<i>Irene Govender, Desmond Govender & Manesh Purshotam, University of KwaZulu-Natal, South Africa</i>	

Doctoral Students' Experiences and Perceptions of Social Media in Higher Education	286
<i>Eunice Luyegu, Alyssa Brussee, Lauren Montgomery & Catherine Varner, Nova Southeastern University, United States</i>	
Digital Mechanisms for Making Network Discussion Forum Toward Altruistic Forum	294
<i>Jui-Yi Wang, National Central University, Taiwan; Shu-Han Yang, Chien Hsin University of Science and Technology, Taiwan; Sung-Yu Hsu, Chun-Hsien Lee & Gwo-Dong Chen, National Central University, Taiwan</i>	
Using a Video Conferencing System to Expand Student Reach	302
<i>Ieda M. Santos, Patricia Fidalgo, Martina Dickson, Samir Mohammed & Mubarak Al Jaberi, Emirates College for Advanced Education, United Arab Emirates</i>	
Adult Learners' Self- Directed Learning in a Blended Synchronous Learning Environment	307
<i>Zhiqiang Amos TAY & ChoonLang Gwendoline QUEK, National Institute of Education, Nanyang Technological University, Singapore</i>	
Implementation of Digital Portfolios in Early Childhood Education	313
<i>Maria Alanko, Marja Kankaanranta & Veera Kenttälä, University of Jyväskylä, Finland</i>	
Team-Issuing Style of a Digital Badge: Operation System for Quality Assurance of Education	322
<i>Kei Amano, Shigeki Tsuzuku, Katsuaki Suzuki & Naoshi Hiraoka, Kumamoto University, Japan</i>	
Preliminary Analysis of an Instrument to Assess Computational Thinking Skills in Japanese Junior High Students	326
<i>Takahisa Furuta, Gunma University, Japan; Kohei Otomo, Kita-Akagi Junior-High School, Gunma, Japan; Gerald Knezek, University of North Texas, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, UNT, United States</i>	
Connection and Constructive Critiques: Using Online Journals to Improve Instructor Feedback	331
<i>Kim Livengood & Sara Carlisle, Angelo State University, United States</i>	
Wikipedia as complementary formative assessment method in University Courses	335
<i>Corrado Petrucco, University of Padova, Italy</i>	
Educational Innovativeness and its Assessment in a Mooc Course "New Media in Education"	339
<i>Rivka Wadmany, Council for Higher Education, Israel; Orly Melamed, Kibbutzim College of Education, Israel</i>	

The BASE system: a Digital Behavioral Assessment tool for school environment	349
<i>Giuseppe Chiazzese, Eleonora Mariscalco, Antonella Chifari & Gianluca Merlo, Consiglio Nazionale delle Ricerche - Istituto per le Tecnologie Didattiche, Italy; Sui Lin Goei, Vrije Universiteit, Netherlands; Eleni Mangina, University College of Dublin, Ireland; Isabella Giammusso, Università degli Studi di Palermo, Italy; Manuela Sanches-Ferreira, Universidade do Porto, Portugal; Luciano Seta, Consiglio Nazionale delle Ricerche - Istituto per le Tecnologie Didattiche, Italy</i>	
Assessment Avenue: The Roadmap to Higher Education Student Success	355
<i>Jeanne Bedell, Jessica Fuda-Daddio & Manuel Rosa, Keiser University, United States</i>	
Computational Thinking in Student Reflections: A Thematic Analysis of Video Project Documentation in the Afterschool Makerspace	358
<i>Jennifer Houchins & Kevin Oliver, North Carolina State University, United States</i>	
Evidence of Computational Thinking from Circuitry Projects in the After-School Makerspace	364
<i>Kevin Oliver & Jennifer Houchins, North Carolina State University, United States</i>	
Preparing Teachers to Capture and Assess Evidence of Computational Thinking	370
<i>Kevin Oliver & Jennifer Houchins, North Carolina State University, United States</i>	
Inservice teachers' beliefs about classroom assessment and their selection of classroom assessment strategies	376
<i>Zafer Unal, USF St.Petersburg, United States; Aslihan Unal, Georgia Southern University, United States; Michael Sampson, St. John's University, United States</i>	
Information Technology Employers' Perceptions of Valuable Entry-Level Competencies and Undergraduate Program Standards: A Comparison	382
<i>Jung Hoon Baeg, Faye R. Jones & Marcia A. Mardis, Florida State University, United States</i>	
Changes in Cognitive Knowledge Structures During an Online Educational Technology Course	388
<i>Rhonda Christensen & Gerald Knezek, University of North Texas, United States</i>	

Practice and Evaluation of Teaching Package of Programming Education at Elementary School in Collaboration with Science Museum — Focusing on the Questionnaire Survey at Pilot School —	396
<i>Yuki Kobayashi, Ibaraki University, Japan; Hitoshi Nakagawa, The Open University of Japan, Japan; Masuo Murai, Hokurikugakuin University, Japan; Yukie Sato, Former Kanazawa Seiryō University, Japan; Chie Takahashi & Etsuko Miyajima, Komatsu Educational Center, Japan</i>	
Retention of ICT Skills Acquired in Face-to Face Training Course for Adult Learners	402
<i>Makiko Miwa, Hideaki Takahashi, Tosho Akimitsu, Emi Nishina & Yoshitomo Yaginuma, The Open University of Japan, Japan</i>	
Analysis in Business Game Practice focusing on Multitasking with Smartphones	411
<i>Takashi Tachino, Shoin University, Japan; Yuuki Kato, Sagami Women's University, Japan; Shogo Kato, Tokyo Woman's Christian University, Japan; Yasuhito Kishi & Jaewook Kim, Shoin University, Japan</i>	
Performance Evaluation Experiment of The System Measuring The Ability for Summarizing Manga	417
<i>Toshihiko Takeuchi, Surugadai University, Japan; Shogo Kato, Tokyo Woman's Christian University, Japan; Yuuki Kato, Sagami Women's University, Japan</i>	
The relationship between ICT self-efficacy and ICT skills and activities: A pilot study among Czech upper secondary school students	421
<i>Hana Vošková, Jiří Štípek, Miroslava Cernochova, Hasan Selcuk, Jan Hrabák & Kateřina Králová, Faculty of Education, Charles University, Czech Republic</i>	
Practice to Think Critically in an age of Digital Native : "Fake News" Reading for Media Literacy	428
<i>Noboru Wakayama, Faculty of Law, Teikyo University, Japan; Takashi Tachino, Faculty of Tourism and Media Culture, Shoin University, Japan</i>	
Implementing Accessibility Programs at Two Very Different Higher Education Institutions	435
<i>Correy Murphy, Glasgow School of Art, Learning Technology, United Kingdom; Nancy O'Laughlin, University of Delaware, Information Technologies - Academic Technology Services, United States</i>	

Professionals, education, ICTs and technology: partners in co-ownership of inclusive health care provisions in low-to-medium income countries (LMICs). 442

Ilse Wambacq, Montclair State University, United States; Koen DePryck, Vrije Universiteit Brussel, Int Inst of Edu for Development, Institute of Knowledge Management, Belgium; Diana Gaddum-Riedewald, International Institute of Education for Development, Suriname; Maryrose McInerney & Janet Koehnke, Montclair State University, United States; Joan Besing, besingj@mail.montclair.edu, United States; Jerry Oldenstam, Int Inst of Edu for Development, COVAB, Suriname

Computational Thinking in Education 449

Miroslava #ernochová, Charles University, Prague, Czech Republic; Diane van der Linde, Windesheim University, Netherlands; Allard Strijker, SLO, Netherlands; Erik Bolhuis & Wim Trooster, Windesheim University of Applied Sciences, Netherlands; Kevin Oliver & Jennifer Houchins, North Carolina State University, United States; Joke Voogt, University of Amsterdam/ Windesheim University of Applied Sciences, Netherlands

The Relationships among Principals' Technology Leadership, Teachers' Learning Community and Innovation Management of Junior High Schools 453

I-Hua Chang, Department of Education, National Chengchi University, Taiwan; Cheng-Mei Hsu, Department of Visual Communication Design, Taiwan; Chiung-Chih Hu, Taoyuan Municipal Daxi Junior High School, Taiwan

Mandatory CPD as a means to implementing educational technologies in academic practice - experiences from a large Business School 466

Dorte Rossen & Maria Hvid Stenalt, Aarhus University, School of Business and Social Sciences, Centre for Teaching and Learning, Denmark

E-Learning in Peru: Habits and Attitudes Towards Online Distance Learning 470

Maria Ruuskanen, Tampere University of Applied Sciences, Finland; José Miguel Marchena, Instituto San Ignacio de Loyola, Peru; Mark Curcher, Tampere University of Applied Sciences, Finland

Socially Responsible Learning in the digital age: A literature review 475

Klaus Schmidt & Saundarya Srivastava, Illinois State University, United States

Digitalization at Comprehensive Schools in Finland - Teacher's and Principal's Digital Competence and Digital Strategies at School 481

Erika Tanhua-Piironen & Jarmo Viteli, Tampere University, Finland

Student-centered learning analytics development in higher education: initial observations from needs analysis 488

Hanna Teräs & Marko Teräs, Tampere University of Applied Sciences, Finland

Core Themes in the Second International Handbook of Information Technology in Primary and Secondary Education: A Bird’s Eye View	493
<i>Joke Voogt, University of Amsterdam/ Windesheim University of Applied Sciences, Netherlands; Gerald Knezek & Rhonda Christensen, University of North Texas, United States; Jo Tondeur, Vrije Universiteit Brussels/ Ghent University, Belgium; Dirk Ifenthaler, University of Mannheim, Germany; Birgit Eickelmann, University of Paderborn, Germany</i>	
A future-proof curriculum with Digital Literacy	499
<i>Petra Fisser & Allard Strijker, National Institute for Curriculum Development, Netherlands</i>	
The School Inspection and Evaluation (SSE-Irtiqaa) Process in Abu Dhabi: A Case-Study in Data-Driven Leadership and Management	505
<i>David Litz, Emirates College for Advanced Education, United Arab Emirates; Allison Smith, CMHS UAE University, United Arab Emirates; Rida Blaik Hourani, Emirates College for Advanced Education, United Arab Emirates</i>	
A Study on Direction and Development Plan of K-MOOC	509
<i>Hyeon Mi Rha, Korea Research Institute for Vocational Education & Training, Korea (South)</i>	
A new curriculum for the Netherlands including Computational Thinking	515
<i>Allard Strijker & Petra Fisser, SLO, National Institute for Curriculum Development, Netherlands</i>	
Enhancing Primary and Secondary School Students’ Language Learning Through the Interactive Mother-Tongue Languages Portal: Examining the Design and User Experience	521
<i>Yuh Huann Tan, The Academy of Singapore Teachers, Ministry of Education, Singapore, Singapore; Seok Hwa Sim, Curriculum Planning & Development Division 1, Ministry of Education, Singapore, Singapore</i>	
Digitizing teaching and learning. Examples from FernUniversität in Hagen.	531
<i>Annabell Bils, FernUniversität in Hagen, Germany</i>	
What teachers want from digital educational tools for personalized learning	536
<i>Geertje Damstra, Oberon - educational research institute (www.oberon.eu), Netherlands; Rianne Exalto, Oberon, Netherlands; Iris Remmerswaal, Kennisnet, Netherlands</i>	
Intentional Innovation: Creating an inclusive process that encourages and captures great education ideas for design and development	541
<i>Chery Lucarelli, The College of St Scholastica, United States</i>	
Making Sense of New Technology Integration Frameworks in 21st Century Teacher Education Program	545
<i>Kele Anyanwu, University of Wisconsin - Stevens Point., United States</i>	

Examining Pre-Service Teachers’ Computational Thinking: Are there Differences Between Gender in Digital Game Construction?	552
<i>Corbett Artym, Edmonton Public School Board; University of Alberta, Canada; Mike Carbonaro, University of Alberta, Canada</i>	
ICT competences of teachers in Higher Education in Developing countries. Challenges for quality education for professional development based on the DigCompEdu framework	558
<i>Abby-Gail Blanchard & Genevieve Blanchard, FHR School of Business, Suriname; Yashtee Gowreea & Koen DePryck, Vrije Universiteit Brussel. Institute of Knowledge Management, Belgium</i>	
Implementing Computational Thinking into the Curriculum and Teacher Education in the Czech Republic: Facts and First Experiences	564
<i>Miroslava Cernochova, Charles University, Faculty of Education, Czech Republic</i>	
Training in Instructional Design Practices: Does It Increase Preservice Teachers’ Ability to Integrate Technology?	570
<i>Gayle Davidson-Shivers & Stephanie Hulon, University of South Alabama, United States</i>	
Teacher Candidates Perception of Acquiring TPACK in the Digital Age Through an Innovative Educational Technology Masters Program	581
<i>Maria Esposito & Rickey Moroney, Molloy College, United States</i>	
“Each lesson was a success experience”: Lessons Learned from an Information Technologies Course for Ultra- and Non-Ultra-Orthodox Teacher Trainees	599
<i>Alona Forkosh Baruch, Levinsky College of Education, Tel Aviv University, Israel; Rivka Gadot, Tel Aviv University, Levinsky College of Education, Open University of Israel, Israel; Lilach Alon, Tel Aviv University, Israel</i>	
Online Professional Development for CS Teachers: Instructional Design Strategies for Broadening Participation in High School Computing	606
<i>Joanna Goode, University of Oregon, United States; Kirsten Peterson & Joyce Malyn-Smith, EDC, United States; Gail Chapman, Exploring Computer Science, United States</i>	
Disrupting the long road of learning 3D animation by using game engine technology	612
<i>Gray Hodgkinson, Nanyang Technological University, Singapore</i>	
Research on STEAM Practice Programs to Enhance Self-Efficacy of Pre-Service Special Education Teachers	617
<i>Yu-Chih Huang & Tzu-Ying Chen, National Pingtung University, Taiwan</i>	

Predictors of STEM Career Interest Among Middle School Students: Implications for Educational Reform, Policy, and Innovation	625
<i>Gerald Knezek, University of North Texas, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, United States</i>	
Educational Innovation and ICT in Pre-Service Teacher Training	631
<i>Henk La Roi & Roland Bruijn, Windesheim University of Applied Sciences, Netherlands</i>	
Engaging Pre-service Mathematics Teachers in Guided Reflection in an Online Community of Practice	633
<i>Wilfred W.F. Lau, The Chinese University of Hong Kong, China</i>	
Pre-service and In-service Elementary Teachers' Teaching Plans of Design-based STEM Instruction	639
<i>Sheau-Wen Lin, Wen-Chien Hsie, Ya-Ting Lee & Yu-Chih Huang, National Pingtung University, Taiwan</i>	
Investigation on conceptions of teaching: An empirical study of Taiwanese student teachers	644
<i>Tzu-Chiang Lin, National Kaohsiung University of Science and Technology, Taiwan</i>	
An update on technology and the early childhood classroom: pre-service and practising teachers learning alongside one another	650
<i>Jean Macnish, The University of Notre Dame, Australia</i>	
The Developmental Paths of In-service Teachers in Specialization Programme for Digital Pedagogy	660
<i>Satu Piispa-Hakala & Sini Kontkanen, University of Eastern Finland, Finland; Tiina Korhonen, University of Helsinki, Finland; Marjaana Veermans, University of Turku, Finland</i>	
The Use of ICT by English Teachers in Public Primary Schools	664
<i>José-Luis Ramírez-Romero, Universidad de Sonora, Mexico; Cristian Gomez-Dominguez, University of Sonora, Mexico</i>	
Supporting Language Learners in the Inclusive Classroom: Using UDL and Digital Tools	671
<i>Kavita Rao, University of Hawaii at Manoa, United States; Caroline Torres, Kapiolani Community College, United States</i>	
Best of Finland: Mapping support strategies for pre-service teachers' ICT integration: SQD in Finland.	676
<i>Teemu Valtonen & Nhi Hoang, University of Eastern Finland, Finland; Anneke Smits, Windesheim University, Netherlands; Jo Tondeur, Vrije Universiteit Brussel, Belgium; Jari Kukkonen, University of Eastern Finland, Finland; Jari Laru, University of Oulu, Finland; Jenni Kankaanpää & Erkki Sointu, University of Eastern Finland, Finland</i>	

Computational Thinking on Primary Education Teacher Education	684
<i>Diane van der Linde, Windesheim University of Applied Sciences, Netherlands; Joke Voogt, University of Amsterdam/ Windesheim University of Applied Sciences, Netherlands</i>	
Using authentic video cases and asynchronous online discussion to teach classroom management	692
<i>Tsering Wangyal, Angela Wong Foong Ling & Yiong Hwee Teo, National Institute of Education, Singapore, Singapore</i>	
The Development of Training Course to Improve Software Education Teaching-Efficacy for Elementary School Teachers in South Korea: Focus on Understanding by Backwards Design	698
<i>Soyul Yi & YoungJun Lee, Dept. of Computer Education, Korea National University of Education, Korea (South)</i>	
Exploring Students' Perspectives on Web-based Analytical Tasks to Enhance Students' Understanding of Islam and Islamic Civilization	703
<i>Abdulaziz BinTaleb, King Saud University, Saudi Arabia</i>	
Who are these people? Using Progressive Personas to Guide STELLAR Development	709
<i>Janette Hill, Katherine Walters, Yeonjoo Ko, SeJung Kwon, Jay Rojewski & Ike Choi, University of Georgia, United States; Elaine Fisher & Linda McCauley, Emory University, United States</i>	
Automatic Authentication of Students at an Interactive Learning-Video Platform	715
<i>Josef Wachtler, Educational Technology - Graz University of Technology, Austria; Marco Scherz, Working Group Sustainable Construction Institute of Technology and Testing of Construction Materials, Austria; Martin Ebner, Educational Technology - Graz University of Technology, Austria</i>	
Measurement of Pronunciation Difficulty using Support Vector Regression	729
<i>Takehiko Yoshimi, Ryukoku University, Japan; Katsunori Kotani, Kansai Gaidai University, Japan</i>	
Assessing the Utility of Deep Learning: Using Learner-System Interaction Data from BioWorld	734
<i>Tenzin Doleck, University of Southern California, United States; Eric Poitras, University of Utah, United States; Susanne Lajoie, McGill University, United States</i>	
A mobile learning analytics tool to foster students' self reflection	739
<i>Giovanni Fulantelli, Davide Taibi, Fabiano Ammirata & Concetta La Mattina, National Research Council of Italy - Institute for Educational Technology, Italy</i>	

Higher Education Experts' Views on Learning Analytics Policy Recommendations for Supporting Study Success: A German Case 745

Dirk Ifenthaler & Jane Yau, University of Mannheim, Germany

Ethics and challenges of databased decision making processes in educational contexts 754

Rita Kop, Yorkville University, Canada; Guillaume Durand, National Research Council of Canada, Canada

Intelligent Tutoring System in Archaeology 763

Laia Subirats & Santiago Fort, Eurecat - Centre Tecnològic de Catalunya, Spain; Cristo Hernández, Universidad de La Laguna, Spain; Leopoldo Pérez, IPHES - Institut Català de Paleoecologia Humana i Evolució Social and Universitat Rovira i Virgili, Spain; Mikko Vesisenaho, Tuula Nousiainen, Marika Peltonen & Iryna Miakush, University of Jyväskylä, Finland; G M Sacha, Universidad Autónoma de Madrid, Spain

Evaluating the coverage of syllabus terminology in student's dissertations. 769

Erick Velazquez-Godinez, Institut für Romanistik, Universität Potsdam, Germany; Sylvie Ratté, Software Engineering and IT department, École de Technologie Supérieure, Canada; Frank de Jong, Educational faculty, Aeres Hogeschool Wageningen, Netherlands

Formative evaluation in the service of active learning 783

Sami Ammar & Sylvain Lefebvre, Polytechnique Montréal, Canada

Influences on Science Teacher Technology Acquisition and Integration Within International Schools 790

Erik Kormos, Colegio Karl C. Parrish, Colombia; Jair Medina, Universidad del Norte - Barranquilla, Colombia, Colombia; Pamela Zipper, Colegio Karl C. Parrish, Colombia

Professor YouTube and Their Interactive Colleagues How Enhanced Videos and Online Courses Change the Way of Learning 796

Walther Nagler, Maria Haas, Martin Schön & Martin Ebner, Educational Technology, Graz University of Technology, Austria, Austria

Exploring the Critical Factors Affecting College Students' Intelligent Learning 806

Hung-Yi Wu, Department of Business Administration, National Chiayi University, Taiwan; Hung-Shu Wu, Department of Smart Living Technology, Huafan University, Taiwan; Yu-Pei Su, Department of Business Administration, National Chiayi University, Taiwan

Assessing General Technology Competency and Use: Correlates of Confidence and Experience with a Range of Communications Devices	818
<i>Joshua DiPasquale, University of Calgary, Canada; Bill Hunter, Roland van Oostveen & William Goodman, University of Ontario Institute of Technology, Canada; Wendy Barber & Maurice DiGuiseppe, University of Ontario Institute of Technology, Canada</i>	
Innovative Education Experts: Holistic talent development and integration of sustainable development goals to 2030	824
<i>Lani Fraizer, University of the Pacific Benerd School of Education, United States</i>	
More than à la carte international research methodology courses: towards researching professionals and professional researchers? The RESET-Francophone project.	829
<i>Barbara Class, University of Geneva, Switzerland</i>	
Inviting Education Online: The Development of an Asynchronous Graduate Program	835
<i>Jim O'Connor, Michael Barbour & Lisa Norton, Touro University California, United States; Peter Wong, Hong Kong Bureau of Education, Hong Kong</i>	
The Audience Effect On Curriculum Design and Student Engagement	841
<i>Julie Bonner & Laura Portolese, Central Washington University, United States</i>	
We Design: Teaching Elementary Students to Develop a Website for a Non-Profit Organization	846
<i>Sarinporn Chaivisit, Oklahoma State University, United States</i>	
Further refinements of conjecture mapping for design-based research	852
<i>Der-Thanq "Victor" Chen, National Institute of Education, Singapore, Singapore; Jing Wu, National Institute of Education, Singapore</i>	
A tale of two arousal types: How perceptual and inquiry arousal influence English learners' interest, cognitive load, and reading comprehension in pedagogical agent-led online reading	856
<i>Jack Drobisz, Sanghoon Park & Glenn Smith, University of South Florida, United States</i>	
Designing An E-learning Module to Develop Problem-Solving Abilities Consistently and Independently Using Various Content	866
<i>Toshiki Matsuda, Institute for Liberal Arts, Tokyo Institute of Technology, Japan; Ayano Imamura, School of Environment and Society, Tokyo Institute of Technology, Japan</i>	

Fostering new media literacy: Course design principles using digital stories and social media	877
<i>Wei Leng Neo, Nanyang Technological University, National Institute of Education Singapore, Singapore; Wei Ching Lee, Der Thanq Chen & Jing Wu, Nanyang Technological University, National Institute of Education Singapore, Singapore</i>	
Applying universal design for learning to promote success in online statistics courses	883
<i>Melanie Shores, The University of Alabama at Birmingham, United States</i>	
Transforming a Pedagogical Theory to Classroom Teaching Patterns with Compiler Transformations from Computer Science	886
<i>Bernhard Standl, Karlsruhe University of Education, Germany</i>	
Technology-enabled learning space for student teachers to experiment innovative pedagogies	893
<i>Tsering Wangyal & Liang Hong Poh, National Institute of Education, Singapore, Singapore</i>	
Using olfactory media cues in e-learning – perspectives from an empirical investigation	899
<i>Anas Ali Alkawasbeh & Gheorghita Ghinea, Brunel University London, United Kingdom</i>	
STAR App: Re-envisioning Instructions in Emerging Learning Spaces	907
<i>Sarinporn Chaivisit, Tutaleni Asino, Younglong Kim, Wilmon Brown, Frances Alvarado-Albertorio, Thanh Do & Kathy Essmiller, Oklahoma State University, United States</i>	
Enhancing AR-based Triangulation Problem-Solving with VR Exploration	909
<i>Ming-Puu Chen, National Taiwan Normal University, Taiwan; Yi-Husan CHEN, Soochow University, Taiwan; Pei-Jyun SUN, National Taiwan Normal University, Taiwan</i>	
The Next Stop: Augmented Reality in the Classroom	913
<i>Shweta Kailani & Rhonda Newton, Texas A&M University, United States</i>	
A Pedagogical Framework for Mixed Reality in Classrooms based on a Literature Review	919
<i>Christopher Kommetter & Martin Ebner, Graz University of Technology, Austria</i>	
Implementation of Augmented Reality Learning Tools in Primary School: Design of Technology Enhanced Learning Activities and materials	930
<i>Sara Mursic, Edge Hill University, United Kingdom</i>	

Developing an Educational and Promotional Augmented Reality Learning Game Smartphone Application	935
<i>Samuel Taylor, Adam Stone & Neil Witkin, Kyushu Sangyo University, Japan</i>	
Problem-Based Learning with a Technological Twist: Blended Learning in a Math Classroom	939
<i>Caroline Morales, Fayette County Public Schools, United States</i>	
Who Am I, and If So How Many? A Multi-Entity Chatbot Business-Interview Simulator for Individualized Practical Assignments in MOOCs	946
<i>Lars Bollweg, Asif Shahriar, Robert Stemmermann & Peter Weber, Fachhochschule Südwestfalen, Germany</i>	
The role of prior knowledge and prior experience on collaborative versus individual problem solving	955
<i>Xun Ge, University of Oklahoma, United States; Ching-Huei Chen, National Changhua University of Education, Taiwan; Victor Law, University of New Mexico, United States; Ling Hu, Jilin University, China; Yan Chen, University of New Mexico, United States</i>	
Learning spaces for “learning through construction”	959
<i>Line Kolås & Hugo Nordseth, Nord university, Norway</i>	
Creating a pedagogical foundation for QR code projects in the schools	966
<i>Susanne Lapp & Eileen Ariza, Florida Atlantic University, United States</i>	
When Legends Share Company Secrets: Can Organizational Culture be a Vehicle for Knowledge Transfer?	970
<i>Andrea Seal, Innove, LLC, United States; Elsa Waters, EGW Consulting, United States</i>	
Introducing Electrical Engineering to Children with an Open Workshop Station at a Maker Days for Kids Event	980
<i>Andreas Strasser, Maria Grandl & Martin Ebner, Graz University of Technology, Austria</i>	
Introducing teachers to leadership skills in complex educational environments	990
<i>Herbert Thomas, Lynley Schofield & Jonathan Lynch, The Mind Lab, New Zealand, New Zealand</i>	
Teachers' Application of TBL Model and its Teaching Efficiency in Smarter Classroom Environment	996
<i>I-Hua Chang, Department of Education, National Chengchi University, Taiwan; Cheng-Mei Hsu, Department of Visual Communication Design, Taiwan; Kuo-Wei Yu, Department of Education, National Chengchi University, Taiwan</i>	

Social media strategies for art and design research	1012
<i>Gray Hodgkinson, Nanyang Technological University, Singapore</i>	
Pair-Programming of video games at a secondary level classroom - concept and case study	1018
<i>Arash Issaee, Renate Motschnig, Oswald Comber & David Haselberger, University of Vienna, Austria</i>	
The Effectiveness of Pair Work Using Smartphones in a Large Class	1028
<i>Yoshihiko Oya, Nagoya University of Foreign Studies, Japan; Kimiko Uchida, Nagoya University of Arts and Sciences, Japan</i>	
Best of The Netherlands: International Computer Supported Collaborative Learning-projects in education. Old dreams and current realities	1033
<i>Henk Sligte, Novum Education Intermedia, Netherlands</i>	
Polymorphic Games: Creating an On-Campus, Commercial Game Studio	1041
<i>Terence Soule & Barrie Robison, University of Idaho, United States</i>	
Developing social capital among learners in collaborative learning through introducing yet another exchange system based on the concept of “bi-directional debt”	1046
<i>Hideyuki Suzuki, Ibaraki University, Japan; Hideo Funaoi, Soka University, Japan; Yoshihiko Kubota, Tmagawa University, Japan; Hiroshi Kato, Open University of Japan, Japan</i>	
Real-time online collaborative coaching pedagogy: Towards contextualization	1057
<i>Päivi Timonen, University of Lapland, Finland</i>	
Geocaching! Teaching Social Studies with Technology	1062
<i>Susan Wagner, Lincoln Memorial University, United States</i>	
Community building as basis for fostering Teaching & Learning innovation - 18 years of project funding	1066
<i>Andreas Reinhardt, Thomas Korner & Melanie Walter, ETH Zurich, Educational Development and Technology, Innovation management, Switzerland</i>	
Preservice and inservice teachers’ beliefs about parental involvement and their selection of parental involvement strategies	1072
<i>Aslihan Unal, Georgia Southern University, United States; Zafer Unal, USF St.Petersburg, United States; Michael Sampson, St. John's University, United States</i>	

Design Process of an Intelligent Tutor to Support Researchers in Training	1079
<i>Fanny Cisneros, Universidad Casa Grande, Ecuador; Victoria I. Martín, Carl von Ossietzky Universität Oldenburg, Germany; Martha Lucia Orellana, Universidad Autónoma de Bucaramanga, Colombia; Nancy Peré, Universidad de la República, Uruguay; Dolores Zambrano & Yidda Marcial, Universidad Casa Grande, Ecuador</i>	
Electronic Data Management and Expert Decision Making for Multi-Tiered System of Supports: Design Research in Early Childhood Literacy and Professional Development	1085
<i>Jack Drobisz, Howard Goldstein, Trina Spencer, Glenn Smith & Lucille Moon-Michel, University of South Florida, United States</i>	
Badges and Leaderboards: Understanding Their Effectiveness on Academic Performance and Motivation of Online Students	1090
<i>Sebiha Balci, Jonathan M. Secaur & Bradley J. Morris, Kent State University, Kent, OH, USA, United States</i>	
Better Together? – A Case Study Comparison of Individualistic vs. Collectivistic Gamification Design	1097
<i>Klaudia Bovermann & Sebastian Habla, FernUniversität in Hagen, Germany; Joshua Weidlich, Heidelberg University of Education, Germany; Theo Bastiaens, Open Universiteit, Heerlen, Netherlands</i>	
GAM LAB – a NEWTON Project large scale pilot: evaluating the impact on motivation and affective state of students with hearing impairment learning STEM subjects	1107
<i>Marilena Bratu & Cristian Buica-Belciu, University of Bucharest, Faculty of Psychology and Educational Sciences, Romania; Jim Playfoot, White Loop Ltd, United Kingdom; Fabio Di Salvatore & Carmine De Nicola, Beyond srl, Italy; Emilia Oprisan, University of Bucharest, Faculty of Psychology and Educational Sciences, Romania</i>	
Does a Simulation Game for Management in Health Science Elicit Learning? A Mixed Method Approach	1117
<i>Susanna M Hanekom, North-West University, South Africa; Chrisna Botha-Ravyse, Phasrec, North-West University and Turku University of Applied Sciences, Finland</i>	
Game-Based Learning and Problem-solving Skills: A Systematic Review of the Literature	1127
<i>Shweta Kailani, Texas A&M, United States; Rhonda Newton, Texas A&M University, United States; Susan Pedersen, Texas A&M, United States</i>	
Game-Based Learning in an Interdisciplinary Context: Making the Case for a High-Impact Educational Practice	1138
<i>Reneta Lansiquot, Tamrah Cunningham & Candido Cabo, New York City College of Technology (City Tech) of The City University of New York (CUNY), United States</i>	

A Comparison of Text-with-Images and Video-Based Instructional Guidance in an Educational Video Game	1142
<i>Susan Pedersen, Mehmet Oren & Karen Butler-Purry, Texas A&M University, United States</i>	
Game Based Learning: A Tabletop Game Approach to Knowledge Application And Pervasive Skill Acquisition	1148
<i>Veruschka Pelser-Carstens, North West University, South Africa, South Africa</i>	
“Let’s Play Color Composition”: A Learning Support Game for Color Based on Fairy Tales	1162
<i>Kazuki Yamamoto, Department of Mechanical Engineering, Tokyo University of Science, Japan; Minami Yano, Department of Information Design, Tama Art University, Japan; Shuya Kawaguchi, Department of Mechanical Engineering, Tokyo University of Science, Japan; Fusako Kusunoki, Department of Information Design, Tama Art University, Japan; Shigenori Inagaki, Graduate School of Human Development and Environment, Kobe University, Japan; Hiroshi Mizoguchi, Department of Mechanical Engineering, Tokyo University of Science, Japan</i>	
Proposal of educational toy for female elementary school students	1168
<i>Mizuki Hino, Hidekathu Yanagi & Yoshiaki Mima, Future University Hakodate, Japan</i>	
Does Remixing Mechanism Improve Learning Effectiveness and Engagement in Drama-Based Learning	1173
<i>Yu-Ling Huang, Department of Computer Science & Information Engineering, National Central University, Taiwan; Su-Hang Yang, Department of Hospitality Management, Chien Hsin University of Science and Technology, Taiwan; Ping-Yu Chiang & Gwo-Dong Chen, Department of Computer Science & Information Engineering, National Central University, Taiwan</i>	
The Effects of a Long-tone Exercise Support System on Wind Instrument Players’ Pitch and Tone Shape	1182
<i>Daisuke Kaneko, School of Economics, Hokusei Gakuen University, Japan; Hisayoshi Kunimune, Chiba Institute of Technology, Japan; Megumi Kurayama, National Institute of Technology, Hakodate College, Japan; Takeshi Morishita, Shinshu University, Japan; Tatsuki Yamamoto, Meikai University, Japan; Hiroaki Oguchi, Shinshu University, Japan</i>	
The Effects of Integrating IRS with a Flipped Classroom on Students' Learning Achievement and Self-efficacy	1188
<i>Wei Li, Wenzhou University, China; Judy C. R. Tseng, Chung Hua University, Taiwan; Li-Chen Cheng, Soochow University, Taiwan</i>	
Best of Ireland: A curious case of persistent learners: insight into serial MOOC participation	1197
<i>Conchúr Mac Lochlainn, Mairéad Nic Giolla Mhichíl, Elaine Beirne & Mark Brown, Dublin City University, Ireland</i>	

A System to Visually Demonstrate the Key Concepts of Multimedia Fundamentals for Undergraduates	1203
<i>Ntokozo Msiza & Johnson Dehinbo, Tshwane University of Technology, South Africa</i>	
Using thinking routines to develop "critical thinking" skills	1217
<i>Mauro Spicci, TAMK University of Tampere (Finland), Italy</i>	
The Conceptual Framework Utilized to Support a Learner-Active, Technology Infused Classroom	1229
<i>Aubrey Statti, The Chicago School of Professional Psychology, United States</i>	
Development and Evaluation of Dialogue-Videos for Socioscientific Issues Based Learning in Elementary Schools	1234
<i>Sayuri Tokura, Etsuji Yamaguchi & Miki Sakamoto, Kobe university, Japan; Tomokazu Yamamoto, Hyogo University of Teacher Education, Japan; Shigenori Inagaki & Kazuya Wakabayashi, Kobe University, Japan; Motoaki Matano, Elementary School Attached to Kobe University, Japan</i>	
The application of WebQuests in teaching English in Bac Lieu high school	1240
<i>My Tran, Bac Lieu High School, Vietnam</i>	
Using Digital Making Words Lessons as a Guided Invented Spelling Instructional Strategy	1246
<i>Ling Wang, Austin Peay State University, United States</i>	
Developing Digital Literacy Through Community Engagement	1251
<i>Elizabeth Truesdell & Rebecca Birch, Dominican University of California, United States</i>	
Co-creation of the Digital Space: Examining the use of web-based tools in Fully Online Learning Community (FOLC) environments	1255
<i>Shannon Webb, University of Ontario Institute of Technology, Canada; Roland van Oostveen, University of Ontario Institute of Technology, Canada; Wendy Barber, University of Ontario Institute of Technology, Canada; Jennifer Percival, University of Massachusetts Lowell, United States; Elizabeth Childs, Royal Roads University, Canada</i>	
Earth Course: Knowledge Acquisition in Technology Enhanced Learning STEM Education in Primary School	1261
<i>Diana Bogusevschi, Dublin City University, Ireland; Cristina Hava Muntean, National College of Ireland, Ireland; Gabriel-Miro Muntean, Dublin City University, Ireland</i>	
Everyday digital practices in library pedagogy	1271
<i>László Czeglédi, Eszterházy Károly University, Hungary</i>	

Support Effective Formative Assessment Through Collaborative Filtering: A Case Study	1277
<i>Gerd Kortemeyer, ETH Zurich, Switzerland; Stefan Dröschler, Ostfalia University of Applied Science, Germany</i>	
Revisiting Predictive Value of BlackBoard Learn Analytics: Determining Communicative Avenues That Best Engage Online Learners	1290
<i>Mary Jo Parker, University of Houston-Downtown, United States</i>	
Preservice Teachers Using Makerspaces to Address the Challenges of Teaching Digital Learners: A Self-Directed Creative Exploration	1297
<i>Candace Figg & Anjali Khirwadkar, Brock University, Canada</i>	
Adult Educators' Beliefs About Their ICT Competencies and Their Professional Use of ICTs. DigCompEdu and StepUp2ICT as Frameworks for Professional Development	1304
<i>Yashtee Gowreea, Vrije Universiteit Brussel & Institute of Knowledge Management, Mauritius; Koen DePryck, Vrije Universiteit Brussel, Institute of Knowledge Management & Int.Inst. of Edu. for Development, Belgium</i>	
The elderly and their memories: digital technologies as an inclusive possibility	1314
<i>Leticia Machado, Jozelina Mendes & Deyse Sampaio, Federal University of Rio Grande do Sul (UFRGS) - Brazil, Brazil; Tássia Priscila Grande, Magali Longhi & Patricia Behar, Federal University of Rio Grande do Sul (UFRGS) - Brasil, Brazil</i>	
Learning mobile repairing by doing and with others	1320
<i>Valérie Payen Jean Baptiste, University of Geneva, Switzerland; Nicolas Nova, Haute-Ecole d'Art et de Design (HEAD), Switzerland; Daniel K. Schneider, University of Geneva - TECFA / FPSE, Switzerland</i>	
Two Cultures Collide: How do Baby Boomers and Millennials Coexist in Organizations?	1325
<i>Elsa Waters, EGW Consulting, United States; Andrea Seal, Innové, LLC, United States</i>	
Individual Development and Collective Change: A Dynamic Approach to University Teacher Training	1329
<i>Kine Dorum & Jelena N. Larsen, UiT The Arctic University of Norway, Norway</i>	
Help! I feel overwhelmed. The use of Just in Time webinars to alleviate anxiousness in student teacher candidates doing the edTPA	1334
<i>Roxanne Pickle, Bemidji State University Minnesota, United States; J. Michael Pickle, St. Cloud State University, United States</i>	

Computer Science Education: Online Content Modules and Professional Development for Secondary Teachers in West Tennessee – A Case Study 1337

Lee Allen, University of Memphis, United States

Creating Technology Enriched Activities to Enhance Middle School Students' Interest in STEM 1344

Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning/University of North Texas, United States; Gerald Knezek, Uni, United States; Frederick Hobbs & Jenna Kelley, Institute for the Integration of Technology into Teaching and Learning, United States; Samson Den Lepcha, Destiny Dong, Samuel Liu, Karen Wang & Hiram-Abi Yotchoum Nzia, University of North Texas, United States; Daniel Kelley, Hebron HS, Lewisville ISD, United States

Libraries of Interactive Books as Powerful Tool for Information Communication 1353

Hermann Maurer, Graz University of Technology, Austria; Namik Delilovic, Graz University of Technolgoy, Austria; Bilal Zaka, COMSATS, Pakistan

Small group text-based discussions in web eBooks: motivation to read, Slovenia 1360

Glenn Smith, University of South Florida, United States; Tomaž Petek, Univerza v Ljubljani Pedagoška fakulteta, Slovenia; Beth Jordan & Amber Lee, University of South Florida, United States

Automatized online study skill counselling. Will students appreciate the advice? 1366

Anna Bager-Elsborg & Kim Jesper Herrmann, Centre for Teaching and Learning, Aarhus University, Denmark

Personalized E-learning Recommender System to Adjust Learners' Level 1371

Mohammed Baidada, Lab-STICC Bretagne-sud University, France, LIMIE ISGA Rabat, Morocco, Morocco; Khalifa Mansouri, SSDIA ENSET Hassan II University, Morocco, Morocco; Franck Poirier, LAB-STICC Bretagne-sud University, France, France

Sustainable Chatbots supporting Learning 1376

Nicoletta Di Blas, Luca Lodi, Paolo Paolini, Barbara Pernici, Niccolò Raspa & Donya Rooein, Politecnico Di Milano (DEIB), Italy; Fabrizio Renzi, IBM research, Italy

Smart learning environment for computing education: readiness for implementation in Nigeria 1382

Agbo Friday Joseph, Oyelere Solomon Sunday, Suhonen Jarkko & Tukiainen Markku, School of Computing, University of Eastern Finland, Finland

High-Functioning Autistic Children Programming Robotic Behavior – A Case Study	1392
<i>Orly Lahav, Vadim Talis & Ravit Shekovitz, School of Education, Tel Aviv University, Israel</i>	
Predicting How They Learn Online: Preliminary Study on Leading Indicators	1398
<i>Takeshi Matsuda, Tokyo Metropolitan University, Japan; Mitsuru Kimoto, Gakken Juku Holdings, Japan; Saoko Tsujita & Ken Kuriyama, Gakken Research Institute for Learning and Education, Japan</i>	
Development of a Learning Characteristics Visualization Function to Support Individually-Optimized Learning	1402
<i>Takeshi Morishita, Daichi Takahashi, Masaaki Niimura & Mitsunori Yatsuka, Shinshu University, Japan</i>	
Effects of Long-Term and Early Use of CAI on Students’ Literacy Skills	1406
<i>Haya Shamir, Kathryn Feehan, David Pocklington & Erik Yoder, Waterford Research Institute, United States</i>	
Reinforcing Second Grade Literacy Skills Using a Computer-Adaptive Reading Program	1412
<i>Haya Shamir, David Pocklington, Erik Yoder & Kathryn Feehan, Waterford Institute, United States</i>	
A Usability Study of an Interactive Auditory Display for Supporting Learning of Molecular Structure	1418
<i>Miguel A. Garcia-Ruiz, Algoma University, Canada; Pedro C. Santana-Mancilla & Laura S. Gaytan-Lugo, University of Colima, Mexico</i>	
Virtual Experiment Environment: a Showcase of a Preparation Tool for Laboratory Classes	1424
<i>Sjors Verstege & Julia Diederren, Wageningen University and Research (WUR), Netherlands</i>	
Virtual Reality in Pharma Research and Development	1435
<i>Valerie Gamble, Pfizer Drug Safety Research and Development and i3Logic, United States; Tracey Trower, Pfizer Drug Safety Research and Development, United States; Catherine Reed-Voorheis, Douglas Braunschweig, Tom Vasko & Bonnie Beresford, i3Logic, Inc., United States</i>	
Virtual Reality in the Media Center- A Year in the Life of Implementation of a High-End Virtual Reality Station	1441
<i>Christi Harp, Henry County Schools, Ola Middle School, United States</i>	
Virtual Immersive Teaching and Learning: How Immersive Technology is Shaping the Way Students Learn	1445
<i>Sean Hauze & James Frazee, San Diego State University, United States</i>	

A Prototype of a Multimedia Learning System and its Problem Examples by Operation Style Answering using HI devices and VR materials	1451
<i>Reo Ishii & Hiroyuki Tominaga, Kagawa University, Japan</i>	
Effectiveness of an inquiry-based virtual lab for a middle school science course	1457
<i>Ting-Ling Lai, You-Sheng Lin & Chi-Yin Chou, Tamkang University, Taiwan</i>	
An Audience Involved Digital Learning Theater in The Classroom to Improve Learning Achievement	1461
<i>Chia-Ying Lee, Department of Computer Science and Information Engineering, National Central University, Taiwan; Su-Hang Yang, Department of Hospitality Management, Chien Hsin University of Science and Technology, Taiwan; Yu-Tzu Liu, Sung-En Chen & Gwo-Dong Chen, Department of Computer Science and Information Engineering, National Central University, Taiwan</i>	
Developing and Exploring the Use of Virtual Reality Learning System to Teach Mathematics Toward Minimizing Failure Rate	1471
<i>Treasure Shabane & Johnson Dehinbo, Tshwane University of Technology, South Africa</i>	
Virtual Reality in Visual Arts Education: A Study on Using Google Tilt Brush	1485
<i>Simon So & Emma Lu, The Education University of Hong Kong, Hong Kong</i>	
Evaluation of VR Dance Teaching Material	1491
<i>Yoko Usui, Tohoku Gakuin University, Japan; Katsumi Sato & Shinichi Watabe, Tohoku University, Japan</i>	
SWAD, an Open Learning Management System: Results and Challenges.	1496
<i>Antonio Cañas, Department of Architecture and Technology of Comp. University of Granada., Spain; Eva Martinez-Ortigosa, Beatriz Prieto, Begoña Pino & Alberto Prieto, Dep. of Architecture and Technology of Computers. University of Granada, Spain</i>	
Proposal of Practice Materials to Learn about Combining AI and IoT based on Graphical Programming Language using Free and Open Source Software	1510
<i>Hiroyuki Dekihara, Hiroshima Shudo University, Japan; Toru Ochi, Osaka Institute of Technology, Japan; Ryuji Miyazaki, Hiroshima International University, Japan; Takuro Ozaki, Osaka Kyoiku University, Japan</i>	
The Global Library of eLearning Tools - GLeLT Portal	1516
<i>Edison Zhongwei Wu, Representing NIE, Nanyang Technological University, Singapore, Masters in Professional Education, Singapore; Jessie Chu Geok Neo, Tsoi Kern Choy & Yin Fong Khong, NIE NTU Singapore, Singapore</i>	

STVALL: HbbTV Based Adaptive System for English Learning through Interactive TV	1520
<i>Jesús Salguero-Serrat, Héctor Sánchez, María José Naranjo & Mercedes Rico, University of Extremadura, Spain; J. Enrique Agudo, Suárez de Figueroa High School, Spain</i>	
Towards a circular economy of learning environments	1526
<i>Daniel K. Schneider, Nicolas Szilas, Julien Da Costa & Barbara Class, University of Geneva - TECFA / FPSE, Switzerland; Jue Wang Szilas, University of Geneva - CFCD, Switzerland</i>	
Business models for Open Educational Resources: how to exploit OER after a funded project?	1537
<i>Guntram Geser & Sandra Schön, Salzburg Research Forschungsgesellschaft mbH (Salzburg, Austria), Austria; Martin Ebner, Graz University of Technology, Austria</i>	
Closing Ed <--> Media Gaps in High Education through situated capacity building	1544
<i>Lisa O'Neill, Delft University of Technology, Netherlands</i>	
Provoking teachers to explore their professional learning networks	1549
<i>Sarah Prestridge, Griffith University, Australia., Australia; Torrey Trust, University of Massachusetts, United States</i>	
Gender-based “digital divide”: The latest update from meta-analytical research	1555
<i>Eugene Borokhovski, Centre for the Study of Learning and Performance (CSLP), Concordia University, Montreal, Canada, Canada; Rana M. Tamim, College of Education, Zayed University, UAE, United Arab Emirates; David Pickup, Centre for the Study of Learning and Performance (CSLP), Concordia University, Montreal, Canada, Canada; Jihan Rabah, Knowledge One, eConcordia, Montreal, Canada, Canada; Yulia Obukhova, Academy of Psychology and Education, Southern Federal University (SFU), Rostov-on-Don, Russia, Russian Federation</i>	
Schools as Protagonists in the Valorization and Communication of their Local Cultural Heritage	1562
<i>Giulia Bertone, Dept. of Computer Science, University of Milan, Italy; Micaela Bordin, Department of architecture, built environment and construction engineering, Italy; Camilla Casonato, Dept. of Architecture and Urban Studies, Politecnico di Milano, Italy; Nicoletta Di Blas, Dept. of Electronics, Information and Bioengineering, Politecnico di Milano, Italy; Valeria Pracchi, Department of architecture, built environment and construction engineering, Italy; Marco Vedoà, Dept. of Architecture and Urban Studies, Politecnico di Milano, Italy</i>	
Exploring WWII Heroes Through Digital Stories	1569
<i>Karla Kingsley, Rebecca Sanchez & Margo Collier, University of New Mexico, United States</i>	

"Let's Imagine Animals ": An Interactive System of Floor-Projected Footprints to Provide Kindergartners Opportunities to Experience Advanced Art	1573
<i>Tomoharu Morita, Department of Mechanical Engineering, Tokyo University of Science, Japan; Sari Iwatate, Department of Information Design, Tama Art University, Japan; Mikihiro Tokuoka, Department of Mechanical Engineering, Tokyo University of Science, Japan; Yuta Taki, Department of Human Development and Education, Kobe University, Japan; Fusako Kusunoki, Department of Information Design, Tama Art University, Japan; Shigenori Inagaki, Graduate School of Human Development and Environment, Kobe University, Japan; Hiroshi Mizoguchi, Department of Mechanical Engineering, Tokyo University of Science, Japan</i>	
Creating Opportunities for Entry into the Trades: Using a Blended Classroom	1579
<i>Dalton Mervold, Saskatchewan Polytechnic, Canada</i>	
Is your screen time, time well spent?	1585
<i>Dusti Howell, Emporia State University, United States</i>	
Examining the Creation of Video Podcasts to Improve the Quality of Mathematical Explanations for Pre-Service Teachers	1590
<i>Robin Kay & Robyn Ruttenberg-Rozen, University of Ontario Institute of Technology, Canada</i>	
Eight days of digital literacy: New strategies for the K-3 classroom	1595
<i>Stefanie Onieal, Burriss Laboratory School, United States; Jennifer Palilonis, Ball State University, United States</i>	
Outsourcing our brain to technology: declutter the clutter	1604
<i>Ellen Taricani, Penn State University, United States</i>	
Computer Assisted Language Learning Technologies for Middle Grades ESL Learners	1611
<i>Liliana Julio, Universidad Simon Bolivar, Colombia; Erik Kormos, Adam Morgan & Sofia Isaac, Colegio Karl C. Parrish, United States</i>	
Kupuna Intergenerational Technology Workshops in Hawai`i	1617
<i>Kathleen Klinger, National University, United States</i>	
Understanding successful and sustained technology enabled learning across institutional and cultural contexts in higher education	1623
<i>Anat Cohen, Tel Aviv University, Israel; Tal Soffer, Tel Aviv University, Israel; Michael Henderson, Monash University, Australia</i>	
Does Students' ICT Usage Affect their Achievements in Civic and Citizenship Education? -A Comparative Analysis Based on IEA-ICCS-	1631
<i>Satoru Fujitani, Mejiro University, Japan; Motoko Fujitani, Joetsu University of Education, Japan</i>	

A mobile learning platform to guarantee education continuity for unaccompanied foreign minors and refugees	1636
<i>Giovanni Fulantelli, Davide Taibi & Giovanni Todaro, National Research Council of Italy - Institute for Educational Technology, Italy; Vito Pipitone, National Research Council of Italy, Italy; Dario La Guardia & Marco Arrigo, National Research Council of Italy - Institute for Educational Technology, Italy</i>	
When tradition meets technology: Curating digital collections to enhance learning of traditional knowledge	1641
<i>Karim Tharani, University of Saskatchewan, Canada</i>	
Reflections on a Blended-Learning Intervention with Adult Education Professionals: Mind the Gaps!	1645
<i>Carmen Biel & Jan Koschorreck, German Institute for Adult Education - Leibniz-Centre for Lifelong Learning, Germany</i>	
Evaluating Flipped and Traditional Pedagogy with Retrieval Practice in Mathematics for Computing	1653
<i>James Eustace, Michael Bradford & Pramod Pathak, National College of Ireland, Ireland</i>	
Online Active Learning Modules to Address Longstanding Gaps in Engineering Education for Students At-Risk of Non-Persistence	1662
<i>Daniel Kelly, Texas Tech University, United States; Aaron Clark, North Carolina State University, United States; Jeremy Ernst, Embry-Riddle Aeronautical University, United States</i>	
Combining face-to-face teaching with a MOOC in an introductory course for Computer Science.	1670
<i>Alberto Prieto, Begoña Pino & Beatriz Prieto, Dep. of Architecture and Technology of Computers. University of Granada, Spain</i>	
Blended support for students' reading in teacher education using PeerWise and Padlet	1681
<i>Anneke Smits, Erna van Koeven & Lieke van Velze, Windesheim University, Netherlands</i>	
Ingredients for a positive view of Flipped Classroom in higher education	1690
<i>Erkko Sointu, Teemu Valtonen, Jenni Kankaanpää, Mareena Hyypiä, Lasse Heikkinen & Laura Hirsto, University of Eastern Finland, Finland</i>	
Digging deeper into instructors' experiences in a flipped classroom: A qualitative study	1698
<i>Hae-Deok Song, Rang Kim, Yeonkyoung Kim, Jihye Choi, Xueying Cui & Ye-chan Lee, Chung-Ang University, Korea (South)</i>	

Promoting and Monitoring Cognitive Engagement of Online Students in Blended Synchronous Learning	1703
<i>Qiyun Wang, NIE, Singapore</i>	
Digital Competences Model for Distance Learning Students: MCompDIGEAD	1708
<i>Ketia Kellen Araújo da Silva, Universidade Federal do Rio Grande do Sul (UFRGS)/ Brazil, Brazil; Patricia Alejandra Behar, Universidade Federal do Rio Grande do Sul, Brazil; Teresa Romeu Fontanillas & Montse Guitert Catasús, Universitat Oberta de Catalunya (UOC), Spain</i>	
Collaborative E-learning for professional development Quality improvement of E-learning for CPD in curriculum development in Suriname	1718
<i>Genevieve Blanchard, FHR Institute for Higher Education, Suriname; Abby-Gail Blanchard, FHR School of Business, Suriname; Koen DePryck, Vrije Universiteit Brussel & Institute of Knowledge Management, Belgium</i>	
College Faculty's Beliefs About Teaching Online: To Teach or Not to Teach?	1724
<i>Ariana Eichelberger, Peter Leong & Curtis Ho, University of Hawaii-Manoa, United States</i>	
Mentoring New Faculty: A Blended Approach Using Technology Tools	1729
<i>Jennifer Engle & Kim Livengood, Angelo State University, United States</i>	
Asynchronous vs Synchronous Learning: Conflict and Resolution	1733
<i>Peter Serdyukov & Nataliya Serdyukova, National University, United States</i>	
Lessons from Online Teaching	1742
<i>Ludwig Slusky, California State University, Los Angeles, United States</i>	
Supervision of students' projects: How to support and increase flexibility and efficiency by use of web 2.0 technologies?	1757
<i>Tobias Alsted Nielsen & Gitte Wichmann-Hansen, Aarhus University, School of Business and Social Sciences, Centre for Teaching and Learning, Denmark</i>	
Thinking like a trainer, acting like a programmer	1762
<i>Ricardo Almeida & Teresa Pessoa, University of Coimbra, Portugal; Anabela Gomes, Coimbra Polytechnic - ISEC, Portugal</i>	
Knowledge Acquisition by Employing Adaptive Multimedia in Third Level Technology Enhanced Learning STEM Education	1773
<i>Ting Bi, Dublin City University, Ireland; Longhao Zou, Southern University of the Science and Technology, China; Muhammed Maddi, Dublin City University, Ireland; Gregor Rozinaj, Slovak University of Technology in Bratislava, Slovakia (Slovak Republic); Gabriel-Miro Muntean, Dublin City University, Ireland</i>	

A Preliminary Exploration of the Effects of Personality and Self-Efficacy for Online Learning in Higher Education	1780
<i>Jillianne Code & Nick Zap, University of British Columbia, Canada</i>	
ETLAB (Education and Technology Laboratory)	1787
<i>Josep Holgado García & Mercè Gisbert Cervera, Rovira i Virgili University, Spain</i>	
The Good the Bad the Ugly of Artificial Intelligence & Why It Matters in Education	1791
<i>Ferial Khaddage, School of Information Technology Deakin University, Australia; Walid Safi, Lebanese University, Lebanon</i>	
Formalized Early Intervention for Struggling Students: Preliminary Findings at One Completely Online University	1797
<i>Tara Lehan & Ashley Babcock, Northcentral University, United States</i>	
Teaching kids online: how teachers adapt their pedagogy	1802
<i>Sarah Prestridge & Katherine Main, Griffith University, Australia; Lieselot Declercq, D-Teach, Belgium</i>	
Practical STEM at the Open University: The Use of Live Video in the OpenStem Labs to Innovate Teaching and Create a Community of Practical STEM Students	1811
<i>Brian Richardson, Kate Bradshaw, Trevor Collins & Ben Hawkridge, The Open University, United Kingdom</i>	
Effect of online interactive learning environments on students' complex dynamic problem solving skills	1815
<i>Aklilu Tilahun Tadesse & Pål Davidsen, University of Bergen, Norway</i>	
“What does he look like?” : The Use of Transmedia in Programmed Instruction to Teach Adjective to students in Thailand	1825
<i>Supavida Chaivisit, Chiang Mai Rajabhat University, Thailand; Sarinporn Chaivisit, Oklahoma State University, United States</i>	
Best of The Netherlands: Reinforcing Accounting: A Case Study on using M-Learning in a Technology-Enhanced Bachelor Course	1827
<i>Iuliana Sandu, Bas Giesbers & Erik Roelofsen, Rotterdam School of Management, Erasmus University, Rotterdam, the Netherlands, Netherlands</i>	
Introducing TREAT (Teachers redesigning educational activities with technology) - an open online inspiration and development resource on blended learning for HE teachers	1835
<i>Anne-Mette Alsholm, Centre for Teaching and Learning, Aarhus School of Business and Social Sciences, Denmark, Denmark; Mathias Elmose Andersen, Aarhus BSS, Denmark</i>	

Building an Efficient Campus Support Model for Online Instruction	1836
<i>Li-Ling Chen, California State University, East Bay, United States</i>	
Supporting the Development of Interpersonal Skills in Online Courses: Instruction and Supervision Using the “PICCA” Model	1842
<i>Gina Cicco, St. John's University, United States</i>	
Personalized Questionnaires: Helping the Students Learn the Basic Course Concepts	1846
<i>Marta Gatius, Universitat Politecnica de Catalunya, Spain</i>	
Using e-Learning to break geographical barriers in access to professional development: A Brazilian research report	1851
<i>Camilla Guarnieri, University of São Paulo and University of South Florida, United States; Jack Drobisz, University of South Florida, United States; Bruno Arndt, University of São Paulo and University of South Florida, United States; Simone Lopes-Herrera, University of São Paulo, Brazil; Howard Goldstein, University of South Florida, United States</i>	
Going online; a shift from teacher-centered to student-centered teaching and how to facilitate	1856
<i>Oddlaug Marie Lindgaard, Nord University/Tampere University of Applied Sciences, Norway</i>	
Digital Mental Health Resources for Children and Youth - Evaluation of Strengths in User Interface Design	1863
<i>Saana Mehtälä, Marja Kankaanranta, Rebekah Rousi & Kati Clements, University of Jyväskylä, Finland</i>	
Technology in Blended-learning/Online Education in Two Degree Programs at Finnish Universities of Applied Sciences (UAS) - Master of Educational Leadership from TAMK and Master’s in Education Entrepreneurship from OAMK.	1872
<i>Anita Walasiewicz & Heidi Ylitie, Tampere University of Applied Science (TAMK), Netherlands</i>	
Opening the Book on the Price of Student Reading Lists	1877
<i>Eamon Costello, Richard Bolger, Tiziana Soverino, Mark Brown & Gráinne Conole, Open Education, DCU, Ireland</i>	
Designing mobile learning to create active learning and just-in-time learning experience	1882
<i>Xiaorui Sun, Ohio University, United States</i>	
Mobile device integration in self-studying English as a foreign language for non-native English speaking learners: A case study on Japanese learners	1891
<i>Thuy Thi Thanh Nguyen & Takashi Yukawa, Knowledge System Laboratory, Nagaoka University of Technology, Japan</i>	

Digital Divide in China and Taiwan: Case Study 1907

Amy S. C. Leh & Qi Guo, California State University San Bernardino, United States; Ying Wei, Yunnan Normal University, China

Awarding Credit for Experiential Learning: Innovative and Flexible Approaches for Online Students 1909

Susan Oaks & Deborah Smith, SUNY Empire State College, United States

Evaluation of South Africa University Lecturers Accessibility and Utilization of E-Learning Infrastructure for Teaching 1925

Emmanuel Olusola Adu, University of Fort Hare, South Africa, South Africa; Oloyede Ojo & Kemi Olajumoke Adu, University of Fort Hare, South Africa