# 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  
Fawzi BenMessaoud, Indiana University and Purdue University, United States; Taryn Elizabeth Hust, Dwight William Hall, Holly Nichole Handlon & Niranjan Valmik Kshirsagar, Indiana University & Purdue University, United States

**NEWTON Fab Lab Initiative: A Small-Scale Pilot for STEM Education** ......................... 8  
Mohammed Amine Togou, Dublin City University, Ireland; Covadonga Lorenzo & Gianluca Cornetta, CEU San Pablo University, Spain; Gabriel-Miro Muntean, Dublin City University, Ireland

**Collaborative AR application design for early childhood education** .............................. 18  
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

**Utilizing Online Collaboration to Enhance Learners’ Social Emotional Competencies** ................................................................. 28  
Li-Ling Chen, California State University at East Bay, United States

**Using 3D printing for curriculum enhancement** .............................................................. 32  
Patricia Fidalgo & Ieda M. Santos, Emirates College for Advanced Education, United Arab Emirates; Luisa Menano, Marionete, United Kingdom; Joan Thormann, Lesley University, United States

**Analysis and analysis of application for arranging/grouping/structuring children's information which utilized on tablet PC** ................................................................. 36  
Hitoshi Nakagawa, The Open University of Japan, Japan; Masuo Murai, Hokuriku Gakuen University, Japan; Yukie Sato, Kanazawa Seiryo University, Japan; Yuki Kobayashi, Ibaraki University, Japan; Hironori Suzuki & Junichi Morishita, Suzuki Educational Software Co., LTD., Japan

**Best of Germany: Interactive Online Modules as a Digital Support for Students in the Introductory Phase of Civil Engineering Studies** ............................................... 40  
Marcel Pelz, Martin Lang, Yasemin Özmen & Jörg Schröder, University of Duisburg-Essen, Germany; Felix Walker & Ralf Müller, Technical University of Kaiserslautern, Germany

**Usage of Design Thinking for soft skills development** ................................................... 49  
Elvira Strakhovich, Graduate School of Management Saint Petersburg University, Russian Federation

**Best of Germany: Smartglasses as Assistive Tools for Higher Science Education: Towards a Descriptive Model of AR-based Science Laboratories** ................................. 53  
Michael Thees & Sebastian Kapp, Technische Universität Kaiserslautern, Germany; Paul Lukowicz, German Research Center for Artificial Intelligence (DFKI), Germany; Jochen Kuhn, Technische Universität Kaiserslautern, Germany
SpelLit: A Collaborative Body- and Space-related Interactive Learning Game for School Children to acquire Reading and Writing Skills ............................................................... 63
Thomas Winkler, Deniz Akyildiz & Michael Herczeg, University of Luebeck, IMIS, Germany

A Novel Way to Measure Executive Functions in Primary School Students in an Engaging, Child-Friendly and Valid Way. ................................................................. 72
Valeska Berg, Mark McMahon & Shane Rogers, Edith Cowan University, Australia; Michael Garrett & Dominic Manley, Cinglevue International, Australia

The eFun App: A New Tool to Measure Executive Functions to Support Learning in a Child-Friendly, Valid and Engaging Way. ................................................................. 76
Valeska Berg, Mark McMahon & Shane Rogers, Edith Cowan University, Australia; Michael Garrett & Dominic Manley, Cinglevue International, Australia

Assessment Skills and Validity of Peer- and Self-Assessment in In-Service Teacher Training ........................................................................................................... 86
Graziano Cecchinato & Laura Carlotta Foschi, University of Padova, Italy

Is it worth the trouble: does smart, intentionally designed student learning environments increase student participation? ................................................................. 92
Koos De Villiers & Gordon Matthew, North-West University, South Africa

Looking for the Optimal Interactivity Level in the AlgoRythmics Learning Environment ........................................................................................................... 106
Eszter Jáhel Nagy, Pálma Rozália Osztián, Cristian Cosma, Zoltán Kátai & Erika Osztián, Sapientia Hungarian University of Transylvania, Romania

Ameliorating Plagiarism Across Countries and the K-20 Continuum ......................... 115
Michael-Brian Ogawa, University of Hawaii, United States; Kay Sundberg, Karolinska Institutet, Sweden

Best of Germany: How Are Students’ Digital Media Behaviour and Self-Efficacy Related to Academic Achievement? ................................................................. 121
Marina Isabel Pumptow & Taiga Brahm, Eberhard Karls Universität Tübingen, Germany

The process of instructor orientation and socialization to the Moodle LMS in a post secondary context. ................................................................. 132
Mark Zieber, University of Lethbridge, Canada

Digital Citizenry and Personal Branding: An IoT Data Function ................................. 141
Fawzi BenMessaoud & Niranjan Valmik Kshirsagar, Indiana University and Purdue University, United States; Holly Handlon, Dwight Hall & Taryn Husted, Indiana University & Purdue University, United States
Effect of ePortfolio for Goal Setting on Self-Regulated Learning in Computer Course .................................................. 148
Chi-Cheng Chang, National Taiwan Normal University, Taiwan; Yueh-Mai Liao, Yifeng Senior High school, Taiwan

Best of Germany: VorleXung: Cross-linking Recitation Sessions and Physics Lectures using eXperiment-based Video-Analysis Tasks .......................................................... 152
Stefan Küchemann, Pascal Klein & Jochen Kuhn, Technische Universität Kaiserslautern, Germany

Creating ePortfolios as Components of Undergraduates Employability Toolkit ................................................................. 158
Gabrielle Read Jasnoff, Transylvania University, University of Louisville, United States; Amy Sheikh, Transylvania University, Temple University, United States

Robots at School: Supporting Humanities Teaching Through Robots-Based Storytelling ..................................................... 162
Flor Angela Bravo & Enrique Gonzalez, Pontificia Universidad Javeriana, Colombia; Nicoletta Di Blas & Andrea Bonarini, Politecnico di Milano, Italy

Reflective thinking in reading guided by augmented reality ........................................ 176
Lih-Juan ChanLin, Fu Jen Catholic University, Taiwan

Best of Austria: Developing Video Games in Secondary Schools with Unity ................................................................. 181
Oswald Comber, Renate Motschnig, Hubert Mayer & Matthias Hörbe, University of Vienna, Austria

OER and Flipped Classroom – Do they match? ................................................................. 190
Elke Höfler, University of Graz, Austria; Josef Buchner, St. Gallen University of Teacher Education, Switzerland

Application of Augmented Reality Apps for the Enhancement of a Community Science Drought Monitoring Project ................................................................. 199
Ayodeji Ibukun, Thanh Do, Sarinporn Chaivisit, Tutaleni Asino & Nicole Colston, Oklahoma State University, United States

Elementary School Students' Perceptions of Using Student Response Systems ................................................................. 204
Robin Kay, University of Ontario Institute of Technology, Canada

The Impact of collaborative writing on Learning English ................................................. 209
Pei-Lin Liu & Chiu Jung Chen, National Chiayi University, Taiwan
Evaluating e-learning system for English conversation practice with speech recognition and future development using AI ............................................................... 213
Makoto Shishido, Tokyo Denki University, Japan

There is No App for That: Developing Educational Apps through a Cross-Disciplinary Course ................................................................................................................................ 219
Marlo Steed, Faculty of Education, University of Lethbridge, Canada

Mobile Learning: Investigating Unique Strategy Use ................................................................. 225
Ewa Wasniewski & Patricia Boechler, University of Alberta, Canada

Creating Augmented Realities in the Context of Lessons in Secondary Schools ............................................................................................................................... 230
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

Development of online experiments for science education by master of education students using a low-cost and easy approach .................................................................................................................. 248
Momo Chang Xu, Jingjing Wang, Oliver Chan, Ken Chi-Keung Chan & Yau-yuen Yeung, The Education University of Hong Kong, China

Overview on mobile learning with learning analytical support ........................................................................ 253
Jane Yau, University of Mannheim, Germany

Suggestopedic Mobile Language Learning ........................................................................ 257
Jane Yau, University of Mannheim, Germany; Mike Joy, University of Warwick, United Kingdom

Educational use of an innovative mobile logger and evaluation of students’ learning effectiveness in STEM education .................................................................................................................. 261
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 opened a group for myself, to keep my data...”: Personal Information Management and Usage Patterns on WhatsApp .................................................................................. 268
Alona Forkosh Baruch, Levinsky College of Education, Tel Aviv University, Israel; Lilach Alon, Tel Aviv University, Israel

Students’ views on the use of Facebook as an online learning management system in a module in higher education .................................................................................. 277
Irene Govender, Desmond Govender & Manesh Purshotam, University of KwaZulu-Natal, South Africa
Doctoral Students’ Experiences and Perceptions of Social Media in Higher Education .......................................................... 286
Eunice Luyegu, Alyssa Brussee, Lauren Montgomery & Catherine Varner, Nova Southeastern University, United States

Digital Mechanisms for Making Network Discussion Forum Toward Altruistic Forum ................................................................. 294
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

Using a Video Conferencing System to Expand Student Reach ........................................ 302
Ieda M. Santos, Patricia Fidalgo, Martina Dickson, Samir Mohammed & Mubarak Al Jaberi, Emirates College for Advanced Education, United Arab Emirates

Adult Learners’ Self- Directed Learning in a Blended Synchronous Learning Environment ....................................................................................................................... 307
Zhiqiang Amos TAY & ChoonLang Gwendoline QUEK, National Institute of Education, Nanyang Technological University, Singapore

Implementation of Digital Portfolios in Early Childhood Education ........................................ 313
Maria Alanko, Marja Kankaanranta & Veera Kenttälä, University of Jyväskylä, Finland

Team-Issuing Style of a Digital Badge: Operation System for Quality Assurance of Education ........................................................................................................................... 322
Kei Amano, Shigeki Tsuzuku, Katsuaki Suzuki & Naoshi Hiraoka, Kumamoto University, Japan

Preliminary Analysis of an Instrument to Assess Computational Thinking Skills in Japanese Junior High Students .................................................. 326
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

Connection and Constructive Critiques: Using Online Journals to Improve Instructor Feedback ............................................................................................................................ 331
Kim Livengood & Sara Carlisle, Angelo State University, United States

Wikipedia as complementary formative assessment method in University Courses .......................................................... 335
Corrado Petrucco, University of Padova, Italy

Educational Innovativeness and its Assessment in a Mooc Course "New Media in Education" ................................................................................................................................. 339
Rivka Wadmany, Council for Higher Education, Israel; Orly Melamed, Kibbutzim College of Education, Israel
The BASE system: a Digital Behavioral Assessment tool for school environment

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 Setà, Consiglio Nazionale delle Ricerche - Istituto per le Tecnologie Didattiche, Italy

Assessment Avenue: The Roadmap to Higher Education Student Success

Jeanne Bedell, Jessica Fuda-Daddio & Manuel Rosa, Keiser University, United States

Computational Thinking in Student Reflections: A Thematic Analysis of Video Project Documentation in the Afterschool Makerspace

Jennifer Houchins & Kevin Oliver, North Carolina State University, United States

Evidence of Computational Thinking from Circuitry Projects in the After-School Makerspace

Kevin Oliver & Jennifer Houchins, North Carolina State University, United States

Preparing Teachers to Capture and Assess Evidence of Computational Thinking

Kevin Oliver & Jennifer Houchins, North Carolina State University, United States

Inservice teachers’ beliefs about classroom assessment and their selection of classroom assessment strategies

Zafer Unal, USF St.Petersburg, United States; Aslihan Unal, Georgia Southern University, United States; Michael Sampson, St. John's University, United States

Information Technology Employers’ Perceptions of Valuable Entry-Level Competencies and Undergraduate Program Standards: A Comparison

Jung Hoon Baeg, Faye R. Jones & Marcia A. Mardis, Florida State University, United States

Changes in Cognitive Knowledge Structures During an Online Educational Technology Course

Rhonda Christensen & Gerald Knezek, University of North Texas, United States
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 — Yuki Kobayashi, Ibaraki University, Japan; Hitoshi Nakagawa, The Open University of Japan, Japan; Masuo Murai, Hokurikugakuin University, Japan; Yukie Sato, Former Kanazawa Seiryo University, Japan; Chie Takahashi & Etsuko Miyajima, Komatsu Educational Center, Japan

Retention of ICT Skills Acquired in Face-to Face Training Course for Adult Learners — Makiko Miwa, Hideaki Takahashi, Tosho Akimitsu, Emi Nishina & Yoshitomo Yaginuma, The Open University of Japan, Japan

Analysis in Business Game Practice focusing on Multitasking with Smartphones — 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

Performance Evaluation Experiment of The System Measuring The Ability for Summarizing Manga — Toshihiko Takeuchi, Surugadai University, Japan; Shogo Kato, Tokyo Woman’s Christian University, Japan; Yuuki Kato, Sagami Women’s University, Japan

The relationship between ICT self-efficacy and ICT skills and activities: A pilot study among Czech upper secondary school students — Hana Vo#ková, Ji#í Štípek, Miroslava Cernochova, Hasan Selcuk, Jan Hrabák & Kate#ina Králová, Faculty of Education, Charles University, Czech Republic

Practice to Think Critically in an age of Digital Native : "Fake News" Reading for Media Literacy — Noboru Wakayama, Faculty of Law, Teikyo University, Japan; Takashi Tachino, Faculty of Tourism and Media Culture, Shoin University, Japan

Implementing Accessibility Programs at Two Very Different Higher Education Institutions — Correy Murphy, Glasgow School of Art, Learning Technology, United Kingdom; Nancy O’Laughlin, University of Delaware, Information Technologies - Academic Technology Services, United States
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-Piirainen & 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
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

A future-proof curriculum with Digital Literacy ........................................................................................................... 499
Petra Fisser & Allard Strijker, National Institute for Curriculum Development, Netherlands

The School Inspection and Evaluation (SSE-Irtiqaa) Process in Abu Dhabi: A Case-Study in Data-Driven Leadership and Management ................................................................................................................... 505
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

A Study on Direction and Development Plan of K-MOOC ........................................................................................................... 509
Hyeon Mi Rha, Korea Research Institute for Vocational Education & Training, Korea (South)

A new curriculum for the Netherlands including Computational Thinking ................................................................. 515
Allard Strijker & Petra Fisser, SLO, National Institute for Curriculum Development, Netherlands

Enhancing Primary and Secondary School Students’ Language Learning Through the Interactive Mother-Tongue Languages Portal: Examining the Design and User Experience ................................................................................................................... 521
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

Digitizing teaching and learning. Examples from FernUniversität in Hagen. ................................................................................................................................. 531
Annabell Bils, FernUniversität in Hagen, Germany

What teachers want from digital educational tools for personalized learning ................................................................................................................................. 536
Geertje Damstra, Oberon - educational research institute (www.oberon.eu), Netherlands; Rianne Exalto, Oberon, Netherlands; Iris Remmerswaal, Kennisnet, Netherlands

Intentional Innovation: Creating an inclusive process that encourages and captures great education ideas for design and development ......................................................................................... 541
Chery Lucarelli, The College of St Scholastica, United States

Making Sense of New Technology Integration Frameworks in 21st Century Teacher Education Program ................................................................................................................................. 545
Kele Anyanwu, University of Wisconsin - Stevens Point, United States
Examining Pre-Service Teachers’ Computational Thinking: Are there Differences Between Gender in Digital Game Construction? ........................................................... 552
Corbett Artym, Edmonton Public School Board; University of Alberta, Canada; Mike Carbonaro, University of Alberta, Canada

ICT competences of teachers in Higher Education in Developing countries. Challenges for quality education for professional development based on the DigCompEdu framework .................................................................................................................. 558
Abby-Gail Blanchard & Genevieve Blanchard, FHR School of Business, Suriname; Yashtee Gowreea & Koen DePryck, Vrije Universiteit Brussel. Institute of Knowledge Management, Belgium

Implementing Computational Thinking into the Curriculum and Teacher Education in the Czech Republic: Facts and First Experiences ......................................................... 564
Miroslava Cernochova, Charles University, Faculty of Education, Czech Republic

Training in Instructional Design Practices: Does It Increase Preservice Teachers’ Ability to Integrate Technology? ..................................................................................... 570
Gayle Davidson-Shivers & Stephanie Hulon, University of South Alabama, United States

Teacher Candidates Perception of Acquiring TPACK in the Digital Age Through an Innovative Educational Technology Masters Program .................................................. 581
Maria Esposito & Rickey Moroney, Molloy College, United States

“Each lesson was a success experience”: Lessons Learned from an Information Technologies Course for Ultra- and Non-Ultra-Orthodox Teacher Trainees ............... 599
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

Online Professional Development for CS Teachers: Instructional Design Strategies for Broadening Participation in High School Computing ................................................ 606
Joanna Goode, University of Oregon, United States; Kirsten Peterson & Joyce Malyn-Smith, EDC, United States; Gail Chapman, Exploring Computer Science, United States

Disrupting the long road of learning 3D animation by using game engine technology ......................................................................................................................... 612
Gray Hodgkinson, Nanyang Technological University, Singapore

Research on STEAM Practice Programs to Enhance Self-Efficacy of Pre-Service Special Education Teachers ................................................................. 617
Yu-Chih Huang & Tzu-Ying Chen, National Pingtung University, Taiwan
Predictors of STEM Career Interest Among Middle School Students: Implications for Educational Reform, Policy, and Innovation ................................................................. 625
Gerald Knezek, University of North Texas, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, United States

Educational Innovation and ICT in Pre-Service Teacher Training .................................. 631
Henk La Roi & Roland Bruijn, Windesheim University of Applied Sciences, Netherlands

Engaging Pre-service Mathematics Teachers in Guided Reflection in an Online Community of Practice .......................................................... 633
Wilfred W.F. Lau, The Chinese University of Hong Kong, China

Pre-service and In-service Elementary Teachers’ Teaching Plans of Design-based STEM Instruction .......................................................... 639
Sheau-Wen Lin, Wen-Chien Hsie, Ya-Ting Lee & Yu-Chih Huang, National Pingtung University, Taiwan

Investigation on conceptions of teaching: An empirical study of Taiwanese student teachers .......................................................... 644
Tzu-Chiang Lin, National Kaohsiung University of Science and Technology, Taiwan

An update on technology and the early childhood classroom: pre-service and practising teachers learning alongside one another ..................................................... 650
Jean Macnish, The University of Notre Dame, Australia

The Developmental Paths of In-service Teachers in Specialization Programme for Digital Pedagogy .......................................................... 660
Satu Piispa-Hakala & Sini Kontkanen, University of Eastern Finland, Finland; Tiina Korhonen, University of Helsinki, Finland; Marjaana Veermans, University of Turku, Finland

The Use of ICT by English Teachers in Public Primary Schools ........................................ 664
José-Luis Ramírez-Romero, Universidad de Sonora, Mexico; Cristian Gomez-Domínguez, University of Sonora, Mexico

Supporting Language Learners in the Inclusive Classroom: Using UDL and Digital Tools .......................................................... 671
Kavita Rao, University of Hawaii at Manoa, United States; Caroline Torres, Kapiolani Community College, United States

Best of Finland: Mapping support strategies for pre-service teachers’ ICT integration: SQD in Finland. .......................................................... 676
Teemu Valtonen & Nhi Hoang, University of Eastern Finland, Finland; Anneke Smit, Windesheim University, Netherlands; Jo Tondeur, Vrije Universiteit Brussel, Belgium; Jari Kukkonen, University of Eastern Finland, Finland; Jari Laru, University of Oulu, Finland; Jenni Kankaanpää & Erkko Sointu, University of Eastern Finland, Finland
Computational Thinking on Primary Education Teacher Education

Diane van der Linde, Windesheim University of Applied Sciences, Netherlands; Joke Voogt, University of Amsterdam/Windesheim University of Applied Sciences, Netherlands

Using authentic video cases and asynchronous online discussion to teach classroom management

Tsering Wangyal, Angela Wong Foong Ling & Yiong Hwee Teo, National Institute of Education, Singapore, Singapore

The Development of Training Course to Improve Software Education Teaching-Efficacy for Elementary School Teachers in South Korea: Focus on Understanding by Backwards Design

Soyul Yi & YoungJun Lee, Dept. of Computer Education, Korea National University of Education, Korea (South)

Exploring Students’ Perspectives on Web-based Analytical Tasks to Enhance Students’ Understanding of Islam and Islamic Civilization

Abdulaziz BinTaleb, King Saud University, Saudi Arabia

Who are these people? Using Progressive Personas to Guide STELLAR Development

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

Automatic Authentication of Students at an Interactive Learning-Video Platform

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

Measurement of Pronunciation Difficulty using Support Vector Regression

Takehiko Yoshimi, Ryukoku University, Japan; Katsunori Kotani, Kansai Gaidai University, Japan

Assessing the Utility of Deep Learning: Using Learner-System Interaction Data from BioWorld

Tenzin Doleck, University of Southern California, United States; Eric Poitras, University of Utah, United States; Susanne Lajoie, McGill University, United States

A mobile learning analytics tool to foster students’ self reflection

Giovanni Fulantelli, Davide Taibi, Fabiano Ammirata & Concetta La Mattina, National Research Council of Italy - Institute for Educational Technology, Italy
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 Paleoeconomia 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
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

Innovative Education Experts: Holistic talent development and integration of sustainable development goals to 2030 .............................................................. 824
Lani Fraizer, University of the Pacific Benerd School of Education, United States

More than à la carte international research methodology courses: towards researching professionals and professional researchers? The RESET-Francophone project. .............................................................. 829
Barbara Class, University of Geneva, Switzerland

Inviting Education Online: The Development of an Asynchronous Graduate Program .............................................................................................................. 835
Jim O'Connor, Michael Barbour & Lisa Norton, Touro University California, United States; Peter Wong, Hong Kong Bureau of Education, Hong Kong

The Audience Effect On Curriculum Design and Student Engagement .................. 841
Julie Bonner & Laura Portolese, Central Washington University, United States

We Design: Teaching Elementary Students to Develop a Website for a Non-Profit Organization ........................................................................................................ 846
Sarinporn Chaivisit, Oklahoma State University, United States

Further refinements of conjecture mapping for design-based research .................. 852
Der-Thanq "Victor" Chen, National Institute of Education, Singapore, Singapore; Jing Wu, National Institute of Education, Singapore

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
Jack Drobisz, Sanghoon Park & Glenn Smith, University of South Florida, United States

Designing An E-learning Module to Develop Problem-Solving Abilities Consistently and Independently Using Various Content .................................................. 866
Toshiki Matsuda, Institute for Liberal Arts, Tokyo Institute of Technology, Japan; Ayano Imamura, School of Environment and Society, Tokyo Institute of Technology, Japan
Fostering new media literacy: Course design principles using digital stories and social media
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

Applying universal design for learning to promote success in online statistics courses
Melanie Shores, The University of Alabama at Birmingham, United States

Transforming a Pedagogical Theory to Classroom Teaching Patterns with Compiler Transformations from Computer Science
Bernhard Standl, Karlsruhe University of Education, Germany

Technology-enabled learning space for student teachers to experiment innovative pedagogies
Tsering Wangyal & Liang Hong Poh, National Institute of Education, Singapore, Singapore

Using olfactory media cues in e-learning – perspectives from an empirical investigation
Anas Ali Alkasasbeh & Gheorghita Ghinea, Brunel University London, United Kingdom

STAR App: Re-envisioning Instructions in Emerging Learning Spaces
Sarinporn Chaivisit, Tutaleni Asino, Younglong Kim, Wilmon Brown, Frances Alvarado-Albertorio, Thanh Do & Kathy Essmiller, Oklahoma State University, United States

Enhancing AR-based Triangulation Problem-Solving with VR Exploration
Ming-Puu Chen, National Taiwan Normal University, Taiwan; Yi-Husan CHEN, Soochow University, Taiwan; Pei-Jyun SUN, National Taiwan Normal University, Taiwan

The Next Stop: Augmented Reality in the Classroom
Shweta Kailani & Rhonda Newton, Texas A&M University, United States

A Pedagogical Framework for Mixed Reality in Classrooms based on a Literature Review
Christopher Kommetter & Martin Ebner, Graz University of Technology, Austria

Implementation of Augmented Reality Learning Tools in Primary School: Design of Technology Enhanced Learning Activities and materials
Sara Mursic, Edge Hill University, United Kingdom
Developing an Educational and Promotional Augmented Reality Learning Game Smartphone Application ................................................................................................................................. 935
Samuel Taylor, Adam Stone & Neil Witkin, Kyushu Sangyo University, Japan

Problem-Based Learning with a Technological Twist: Blended Learning in a Math Classroom .......................................................................................................................................................................................... 939
Caroline Morales, Fayette County Public Schools, United States

Who Am I, and If So How Many? A Multi-Entity Chatbot Business-Interview Simulator for Individualized Practical Assignments in MOOCs ................................................................. 946
Lars Bollweg, Asif Shahriar, Robert Stemmermann & Peter Weber, Fachhochschule Südwestfalen, Germany

The role of prior knowledge and prior experience on collaborative versus individual problem solving ........................................................................................................................................................................... 955
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

Learning spaces for “learning through construction” .............................................................. 959
Line Kolås & Hugo Nordseth, Nord university, Norway

Creating a pedagogical foundation for QR code projects in the schools ....................... 966
Susanne Lapp & Eileen Ariza, Florida Atlantic University, United States

When Legends Share Company Secrets: Can Organizational Culture be a Vehicle for Knowledge Transfer? ........................................................................................................................................................................... 970
Andrea Seal, Innove, LLC, United States; Elsa Waters, EGW Consulting, United States

Introducing Electrical Engineering to Children with an Open Workshop Station at a Maker Days for Kids Event ................................................................................................................................. 980
Andreas Strasser, Maria Grandl & Martin Ebner, Graz University of Technology, Austria

Introducing teachers to leadership skills in complex educational environments ........................................................................................................................................................................... 990
Herbert Thomas, Lynley Schofield & Jonathan Lynch, The Mind Lab, New Zealand, New Zealand

Teachers' Application of TBL Model and its Teaching Efficiency in Smarter Classroom Environment ........................................................................................................................................................................... 996
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
Social media strategies for art and design research .......................................................... 1012
Gray Hodgkinson, Nanyang Technological University, Singapore

Pair-Programming of video games at a secondary level classroom - concept and case study ........................................................................................................................................ 1018
Arash Issaee, Renate Motschnig, Oswald Comber & David Haselberger, University of Vienna, Austria

The Effectiveness of Pair Work Using Smartphones in a Large Class .......................... 1028
Yoshihiko Oya, Nagoya University of Foreign Studies, Japan; Kimiko Uchida, Nagoya University of Arts and Sciences, Japan

Best of The Netherlands: International Computer Supported Collaborative Learning-projects in education. Old dreams and current realities ...................................................... 1033
Henk Sligte, Novum Education Intermedia, Netherlands

Polymorphic Games: Creating an On-Campus, Commercial Game Studio ............ 1041
Terence Soule & Barrie Robison, University of Idaho, United States

Developing social capital among learners in collaborative learning through introducing yet another exchange system based on the concept of “bi-directional debt” .................................................................................................................................. 1046
Hideyuki Suzuki, Ibaraki University, Japan; Hideo Funaoi, Soka University, Japan; Yoshihiko Kubota, Tmagawa University, Japan; Hiroshi Kato, Open University of Japan, Japan

Real-time online collaborative coaching pedagogy: Towards contextualization .......................................................................................................................... 1057
Päivi Timonen, University of Lapland, Finland

Geocaching! Teaching Social Studies with Technology ............................................. 1062
Susan Wagner, Lincoln Memorial University, United States

Community building as basis for fostering Teaching & Learning innovation - 18 years of project funding ..................................................................................................... 1066
Andreas Reinhardt, Thomas Korner & Melanie Walter, ETH Zurich, Educational Development and Technology, Innovation management, Switzerland

Preservice and inservice teachers’ beliefs about parental involvement and their selection of parental involvement strategies ........................................................................ 1072
Aslıhan Unal, Georgia Southern University, United States; Zafer Unal, USF St.Petersburg, United States; Michael Sampson, St. John’s University, United States
Design Process of an Intelligent Tutor to Support Researchers in Training .......................................................... 1079
Fanny Cisneros, Universidad Casa Grande, Ecuador; Victoria I. Marín, 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

Jack Drobisz, Howard Goldstein, Trina Spencer, Glenn Smith & Lucille Moon-Michel, University of South Florida, United States

Badges and Leaderboards: Understanding Their Effectiveness on Academic Performance and Motivation of Online Students .......................................................... 1090
Sebiha Balci, Jonathan M. Secaur & Bradley J. Morris, Kent State University, Kent, OH, USA, United States

Better Together? – A Case Study Comparison of Individualistic vs. Collectivistic Gamification Design .......................................................... 1097
Klaudia Bovermann & Sebastian Habla, FernUniversität in Hagen, Germany; Joshua Weidlich, Heidelberg University of Education, Germany; Theo Bastiaens, Open Universiteit, Heerlen, Netherlands

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
Marilena Bratu & Cristian Buica-Belciu, University of Bucharest, Faculty of Psychology and Educational Sciences, Romania; Jim Playfoot, White Loop Ltd, United Kingdom; Fabio Di Salvadore & Carmine De Nicola, Beyond srl, Italy; Emilia Oprisan, University of Bucharest, Faculty of Psychology and Educational Sciences, Romania

Does a Simulation Game for Management in Health Science Elicit Learning? A Mixed Method Approach .......................................................... 1117
Susanna M Hanekom, North-West University, South Africa; Chrisna Botha-Ravyse, Phasrec, North-West University and Turku University of Applied Sciences, Finland

Game-Based Learning and Problem-solving Skills: A Systematic Review of the Literature .......................................................... 1127
Shweta Kailani, Texas A&M, United States; Rhonda Newton, Texas A&M University, United States; Susan Pedersen, Texas A&M, United States

Game-Based Learning in an Interdisciplinary Context: Making the Case for a High-Impact Educational Practice .......................................................... 1138
Reneta Lansiquot, Tamrah Cunningham & Candido Cabo, New York City College of Technology (City Tech) of The City University of New York (CUNY), United States
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Comparison of Text-with-Images and Video-Based Instructional Guidance in an Educational Video Game</td>
<td>1142</td>
</tr>
<tr>
<td>Susan Pedersen, Mehmet Oren &amp; Karen Butler-Purry, Texas A&amp;M University, United States</td>
<td></td>
</tr>
<tr>
<td>Game Based Learning: A Tabletop Game Approach to Knowledge Application And Pervasive Skill Acquisition</td>
<td>1148</td>
</tr>
<tr>
<td>Veruschka Pelser-Carstens, North West University, South Africa, South Africa</td>
<td></td>
</tr>
<tr>
<td>“Let’s Play Color Composition”: A Learning Support Game for Color Based on Fairy Tales</td>
<td>1162</td>
</tr>
<tr>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Proposal of educational toy for female elementary school students</td>
<td>1168</td>
</tr>
<tr>
<td>Mizuki Hino, Hidekathu Yanagi &amp; Yoshiaki Mima, Future University Hakodate, Japan</td>
<td></td>
</tr>
<tr>
<td>Does Remixing Mechanism Improve Learning Effectiveness and Engagement in Drama-Based Learning</td>
<td>1173</td>
</tr>
<tr>
<td>Yu-Ling Huang, Department of Computer Science &amp; Information Engineering, National Central University, Taiwan; Su-Hang Yang, Department of Hospitality Management, Chien Hsin University of Science and Technology, Taiwan; Ping-Yu Chiang &amp; Gwo-Dong Chen, Department of Computer Science &amp; Information Engineering, National Central University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>The Effects of a Long-tone Exercise Support System on Wind Instrument Players’ Pitch and Tone Shape</td>
<td>1182</td>
</tr>
<tr>
<td>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</td>
<td></td>
</tr>
<tr>
<td>The Effects of Integrating IRS with a Flipped Classroom on Students’ Learning Achievement and Self-efficacy</td>
<td>1188</td>
</tr>
<tr>
<td>Wei Li, Wenzhou University, China; Judy C. R. Tseng, Chung Hua University, Taiwan; Li-Chen Cheng, Soochow University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Best of Ireland: A curious case of persistent learners: insight into serial MOOC participation</td>
<td>1197</td>
</tr>
<tr>
<td>Conchur Mac Lochlainn, Mairéad Nic Giolla Mhichil, Elaine Beirne &amp; Mark Brown, Dublin City University, Ireland</td>
<td></td>
</tr>
</tbody>
</table>
A System to Visually Demonstrate the Key Concepts of Multimedia Fundamentals for Undergraduates ................................................................. 1203
Ntokozo Msiza & Johnson Dehinbo, Tshwane University of Technology, South Africa

Using thinking routines to develop "crigital thinking" skills ........................................... 1217
Mauro Spicci, TAMK University of Tampere (Finland), Italy

The Conceptual Framework Utilized to Support a Learner-Active, Technology Infused Classroom .................................................................................................................. 1229
Aubrey Statti, The Chicago School of Professional Psychology, United States

Development and Evaluation of Dialogue-Videos for Socioscientific Issues Based Learning in Elementary Schools ................................................................. 1234
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

The application of WebQuests in teaching English in Bac Lieu high school ................................................................. 1240
My Tran, Bac Lieu High School, Vietnam

Using Digital Making Words Lessons as a Guided Invented Spelling Instructional Strategy ................................................................................................. 1246
Ling Wang, Austin Peay State University, United States

Developing Digital Literacy Through Community Engagement ..................................... 1251
Elizabeth Truesdell & Rebecca Birch, Dominican University of California, United States

Co-creation of the Digital Space: Examining the use of web-based tools in Fully Online Learning Community (FOLC) environments .................................................. 1255
Shannon Webb, University of Ontario Insitute of Technology, Canada; Roland van Oostveen, University of Ontario Institute of Technology, Canada; Wendy Barber, University of Ontario Insitute of Technology, Canada; Jennifer Percival, University of Massachusetts Lowell, United States; Elizabeth Childs, Royal Roads University, Canada

Earth Course: Knowledge Acquisition in Technology Enhanced Learning STEM Education in Primary School ................................................................. 1261
Diana Bogusevschi, Dublin City University, Ireland; Cristina Hava Muntean, National College of Ireland, Ireland; Gabriel-Miro Muntean, Dublin City University, Ireland

Everyday digital practices in library pedagogy ................................................................. 1271
László Czeglédi, Eszterházy Károly University, Hungary
Support Effective Formative Assessment Through Collaborative Filtering: A Case Study ................................................................. 1277
Gerd Kortemeyer, ETH Zurich, Switzerland; Stefan Dröschler, Ostfalia University of Applied Science, Germany

Revisiting Predictive Value of BlackBoard Learn Analytics: Determining Communicative Avenues That Best Engage Online Learners ......................... 1290
Mary Jo Parker, University of Houston-Downtown, United States

Preservice Teachers Using Makerspaces to Address the Challenges of Teaching Digital Learners: A Self-Directed Creative Exploration ........................................ 1297
Candace Figg & Anjali Khirwadkar, Brock University, Canada

Adult Educators’ Beliefs About Their ICT Competencies and Their Professional Use of ICTs. DigCompEdu and StepUp2ICT as Frameworks for Professional Development ....................................................................................... 1304
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

The elderly and their memories: digital technologies as an inclusive possibility ......................................................................................... 1314
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, Brasil

Learning mobile repairing by doing and with others .................................................. 1320
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

Two Cultures Collide: How do Baby Boomers and Millennials Coexist in Organizations? .................................................................................. 1325
Elsa Waters, EGW Consulting, United States; Andrea Seal, Innové, LLC, United States

Individual Development and Collective Change: A Dynamic Approach to University Teacher Training ................................................................. 1329
Kine Dorum & Jelena N. Larsen, UiT The Arctic University of Norway, Norway

Help! I feel overwhelmed. The use of Just in Time webinars to alleviate anxiousness in student teacher candidates doing the edTPA ................................................................. 1334
Roxanne Pickle, Bemidji State University Minnesota, United States; J. Michael Pickle, St. Cloud State University, United States
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 & Huram-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 Technology, 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 Lodì, Paolo Paolini, Barbara Pernici, Niccolò Raspa & Donya Rooeini, 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 & Takkiainen Markku, School of Computing, University of Eastern Finland, Finland
High-Functioning Autistic Children Programming Robotic Behavior – A Case Study
Orly Lahav, Vadim Talis & Ravit Shekovitz, School of Education, Tel Aviv University, Israel

Predicting How They Learn Online: Preliminary Study on Leading Indicators
Takeshi Matsuda, Tokyo Metropolitan University, Japan; Mitsuru Kimoto, Gakken Juku Holdings, Japan; Saoko Tsujita & Ken Kuriyama, Gakken Research Institute for Learning and Education, Japan

Development of a Learning Characteristics Visualization Function to Support Individually-Optimized Learning
Takeshi Morishita, Daichi Takahashi, Masaaki Niimura & Mitsunori Yatsuka, Shinshu University, Japan

Effects of Long-Term and Early Use of CAI on Students’ Literacy Skills
Haya Shamir, Kathryn Feehan, David Pocklington & Erik Yoder, Waterford Research Institute, United States

Reinforcing Second Grade Literacy Skills Using a Computer-Adaptive Reading Program
Haya Shamir, David Pocklington, Erik Yoder & Kathryn Feehan, Waterford Institute, United States

A Usability Study of an Interactive Auditory Display for Supporting Learning of Molecular Structure
Miguel A. Garcia-Ruiz, Algoma University, Canada; Pedro C. Santana-Mancilla & Laura S. Gaytan-Lugo, University of Colima, Mexico

Virtual Experiment Environment: a Showcase of a Preparation Tool for Laboratory Classes
Sjors Verstege & Julia Diederen, Wageningen University and Research (WUR), Netherlands

Virtual Reality in Pharma Research and Development
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

Virtual Reality in the Media Center- A Year in the Life of Implementation of a High-End Virtual Reality Station
Christi Harp, Henry County Schools, Ola Middle School, United States

Virtual Immersive Teaching and Learning: How Immersive Technology is Shaping the Way Students Learn
Sean Hauze & James Frazee, San Diego State University, United States
A Prototype of a Multimedia Learning System and its Problem Examples by Operation Style Answering using HI devices and VR materials .................................................. 1451
Reo Ishii & Hiroyuki Tominaga, Kagawa University, Japan

Effectiveness of an inquiry-based virtual lab for a middle school science course ........................................................................................................................................ 1457
Ting-Ling Lai, You-Sheng Lin & Chi-Yin Chou, Tamkang University, Taiwan

An Audience Involved Digital Learning Theater in The Classroom to Improve Learning Achievement .............................................................................................................. 1461
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

Developing and Exploring the Use of Virtual Reality Learning System to Teach Mathematics Toward Minimizing Failure Rate ............................................................. 1471
Treasure Shabane & Johnson Dehinbo, Tshwane University of Technology, South Africa

Virtual Reality in Visual Arts Education: A Study on Using Google Tilt Brush ......................................................................................................................................... 1485
Simon So & Emma Lu, The Education University of Hong Kong, Hong Kong

Evaluation of VR Dance Teaching Material .......................................................................................................................... 1491
Yoko Usui, Tohoku Gakuin University, Japan; Katsumi Sato & Shinichi Watabe, Tohoku University, Japan

SWAD, an Open Learning Management System: Results and Challenges. ................................................................................. 1496
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

Proposal of Practice Materials to Learn about Combining AI and IoT based on Graphical Programming Language using Free and Open Source Software .................................................................................................................................. 1510
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

The Global Library of eLearning Tools - GLeLT Portal ................................................................................................................................. 1516
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
STVALL: HbbTV Based Adaptive System for English Learning through Interactive TV  
Jesús Salguero-Serrat, Héctor Sánchez, María José Naranjo & Mercedes Rico, University of Extremadura, Spain; J. Enrique Agudo, Suárez de Figueroa High School, Spain

Towards a circular economy of learning environments  
Daniel K. Schneider, Nicolas Szilas, Julien Da Costa & Barbara Class, University of Geneva - TECFA / FPSE, Switzerland; Jue Wang Szilas, University of Geneva - CFCD, Switzerland

Business models for Open Educational Resources: how to exploit OER after a funded project?  
Guntram Geser & Sandra Schön, Salzburg Research Forschungsgesellschaft mbH (Salzburg, Austria), Austria; Martin Ebner, Graz University of Technology, Austria

Closing Ed <-> Media Gaps in High Education through situated capacity building  
Lisa O'Neill, Delft University of Technology, Netherlands

Provoking teachers to explore their professional learning networks  
Sarah Prestridge, Griffith University, Australia; Torrey Trust, University of Massachusetts, United States

Gender-based “digital divide”: The latest update from meta-analytical research  
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

Schools as Protagonists in the Valorization and Communication of their Local Cultural Heritage  
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 Vedòà, Dept. of Architecture and Urban Studies, Politecnico di Milano, Italy

Exploring WWII Heroes Through Digital Stories  
Karla Kingsley, Rebecca Sanchez & Margo Collier, University of New Mexico, United States
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Let's Imagine Animals&quot;: An Interactive System of Floor-Projected Footprints to Provide Kindergartners Opportunities to Experience Advanced Art</td>
<td>1573</td>
</tr>
<tr>
<td>Tomoharu Morita, Department of Mechanical Engineering, Tokyo University of Science, Japan; Sarii 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</td>
<td></td>
</tr>
<tr>
<td>Creating Opportunities for Entry into the Trades: Using a Blended Classroom</td>
<td>1579</td>
</tr>
<tr>
<td>Dalton Mervold, Saskatchewan Polytechnic, Canada</td>
<td></td>
</tr>
<tr>
<td>Is your screen time, time well spent?</td>
<td>1585</td>
</tr>
<tr>
<td>Dusti Howell, Emporia State University, United States</td>
<td></td>
</tr>
<tr>
<td>Examining the Creation of Video Podcasts to Improve the Quality of Mathematical Explanations for Pre-Service Teachers</td>
<td>1590</td>
</tr>
<tr>
<td>Robin Kay &amp; Robyn Rutenber-Rozen, University of Ontario Institute of Technology, Canada</td>
<td></td>
</tr>
<tr>
<td>Eight days of digital literacy: New strategies for the K-3 classroom</td>
<td>1595</td>
</tr>
<tr>
<td>Stefanie Onieral, Burris Laboratory School, United States; Jennifer Palilonis, Ball State University, United States</td>
<td></td>
</tr>
<tr>
<td>Outsourcing our brain to technology: declutter the clutter</td>
<td>1604</td>
</tr>
<tr>
<td>Ellen Taricani, Penn State University, United States</td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Language Learning Technologies for Middle Grades ESL Learners</td>
<td>1611</td>
</tr>
<tr>
<td>Liliana Julio, Universidad Simon Bolivar, Colombia; Erik Kormos, Adam Morgan &amp; Sofia Isaac, Colegio Karl C. Parrish, United States</td>
<td></td>
</tr>
<tr>
<td>Kupuna Intergenerational Technology Workshops in Hawai`i</td>
<td>1617</td>
</tr>
<tr>
<td>Kathleen Klinger, National University, United States</td>
<td></td>
</tr>
<tr>
<td>Understanding successful and sustained technology enabled learning across institutional and cultural contexts in higher education</td>
<td>1623</td>
</tr>
<tr>
<td>Anat Cohen, Tel Aviv University, Israel; Tal Soffer, Tel Aviv University, Israel; Michael Henderson, Monash University, Australia</td>
<td></td>
</tr>
<tr>
<td>Does Students’ ICT Usage Affect their Achievements in Civic and Citizenship Education? -A Comparative Analysis Based on IEA-ICCS-</td>
<td>1631</td>
</tr>
<tr>
<td>Satoru Fujitani, Meijiro University, Japan; Motoko Fujitani, Joetsu University of Education, Japan</td>
<td></td>
</tr>
</tbody>
</table>
A mobile learning platform to guarantee education continuity for unaccompanied foreign minors and refugees

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

When tradition meets technology: Curating digital collections to enhance learning of traditional knowledge

Karim Tharani, University of Saskatchewan, Canada

Reflections on a Blended-Learning Intervention with Adult Education Professionals: Mind the Gaps!

Carmen Biel & Jan Koschorreck, German Institute for Adult Education - Leibniz-Centre for Lifelong Learning, Germany

Evaluating Flipped and Traditional Pedagogy with Retrieval Practice in Mathematics for Computing

James Eustace, Michael Bradford & Pramod Pathak, National College of Ireland, Ireland

Online Active Learning Modules to Address Longstanding Gaps in Engineering Education for Students At-Risk of Non-Persistence

Daniel Kelly, Texas Tech University, United States; Aaron Clark, North Carolina State University, United States; Jeremy Ernst, Embry-Riddle Aeronautical University, United States

Combining face-to-face teaching with a MOOC in an introductory course for Computer Science.

Alberto Prieto, Begoña Pino & Beatriz Prieto, Dep. of Architecture and Technology of Computers. University of Granada, Spain

Blended support for students’ reading in teacher education using PeerWise and Padlet

Anneke Smits, Erna van Koeven & Lieke van Velze, Windesheim University, Netherlands

Ingredients for a positive view of Flipped Classroom in higher education

Erkko Sointu, Teemu Valtonen, Jenni Kankaanpää, Mareena Hyypiä, Lasse Heikkinen & Laura Hirsto, University of Eastern Finland, Finland

Digging deeper into instructors’ experiences in a flipped classroom: A qualitative study

Hae-Deok Song, Rang Kim, Yeonkyoung Kim, Jihye Choi, Xueying Cui & Ye-chan Lee, Chung-Ang University, Korea (South)
Promoting and Monitoring Cognitive Engagement of Online Students in Blended Synchronous Learning ................................................................. 1703
Qiyun Wang, NIE, Singapore

Digital Competences Model for Distance Learning Students: MCompDIGEAD ................................................................. 1708
Ketia Kellen Araújo da Silva, Universidade Federal do Rio Grande do Sul (UFRGS)/ Brazil; Patricia Alejandra Behar, Universidade Federal do Rio Grande do Sul, Brazil; Teresa Romeu Fontanillas & Montse Guitert Catasús, Universitat Oberta de Catalunya (UOC), Spain

Collaborative E-learning for professional development Quality improvement of E-learning for CPD in curriculum development in Suriname ................................. 1718
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

College Faculty's Beliefs About Teaching Online: To Teach or Not to Teach? ................................................................. 1724
Ariana Eichelberger, Peter Leong & Curtis Ho, University of Hawaii-Manoa, United States

Mentoring New Faculty: A Blended Approach Using Technology Tools ...................... 1729
Jennifer Engle & Kim Livengood, Angelo State University, United States

Asynchronous vs Synchronous Learning: Conflict and Resolution ................................. 1733
Peter Serdyukov & Nataliya Serdyukova, National University, United States

Lessons from Online Teaching ........................................................................... 1742
Ludwig Slusky, California State University, Los Angeles, United States

Supervision of students’ projects: How to support and increase flexibility and efficiency by use of web 2.0 technologies? ................................................................. 1757
Tobias Alsted Nielsen & Gitte Wichmann-Hansen, Aarhus University, School of Business and Social Sciences, Centre for Teaching and Learning, Denmark

Thinking like a trainer, acting like a programmer ....................................................... 1762
Ricardo Almeida & Teresa Pessoa, University of Coimbra, Portugal; Anabela Gomes, Coimbra Polytechnic - ISEC, Portugal

Knowledge Acquisition by Employing Adaptive Multimedia in Third Level Technology Enhanced Learning STEM Education ................................................................. 1773
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
A Preliminary Exploration of the Effects of Personality and Self-Efficacy for Online Learning in Higher Education ................................................................. 1780
Jillianne Code & Nick Zap, University of British Columbia, Canada

ETLAB (Education and Technology Laboratory) .......................................................... 1787
Josep Holgado García & Mercè Gisbert Cervera, Rovira i Virgili University, Spain

The Good the Bad the Ugly of Artificial Intelligence & Why It Matters in Education ......................................................................................................................... 1791
Ferial Khaddage, School of Information Technology Deakin University, Australia; Walid Safi, Lebanese University, Lebanon

Formalized Early Intervention for Struggling Students: Preliminary Findings at One Completely Online University .............................................................. 1797
Tara Lehan & Ashley Babcock, Northcentral University, United States

Teaching kids online: how teachers adapt their pedagogy ........................................ 1802
Sarah Prestridge & Katherine Main, Griffith University, Australia; Lieselot Declercq, D-Teach, Belgium

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
Brian Richardson, Kate Bradshaw, Trevor Collins & Ben Hawkridge, The Open University, United Kingdom

Effect of online interactive learning environments on students’ complex dynamic problem solving skills ........................................................................................................... 1815
Aklilu Tilahun Tadesse & Pål Davidsen, University of Bergen, Norway

“What does he look like?” : The Use of Transmedia in Programmed Instruction to Teach Adjective to students in Thailand ...................................................... 1825
Supavida Chaivisit, Chiang Mai Rajabhat University, Thailand; Sarinporn Chaivisit, Oklahoma State University, United States

Best of The Netherlands: Reinforcing Accounting: A Case Study on using M-Learning in a Technology-Enhanced Bachelor Course ............................................ 1827
Iuliana Sandu, Bas Giesbers & Erik Roelofsen, Rotterdam School of Management, Erasmus University, Rotterdam, the Netherlands, Netherlands

Introducing TREAT (Teachers redesigning educational activities with technology) - an open online inspiration and development resource on blended learning for HE teachers ......................................................................................................................... 1835
Anne-Mette Alsholm, Centre for Teaching and Learning, Aarhus School of Business and Social Sciences, Denmark, Denmark; Mathias Elmose Andersen, Aarhus BSS, Denmark
Building an Efficient Campus Support Model for Online Instruction .......................... 1836
Li-Ling Chen, California State University, East Bay, United States

Supporting the Development of Interpersonal Skills in Online Courses: Instruction and Supervision Using the “PICCA” Model ................................................................. 1842
Gina Cicco, St. John’s University, United States

Personalized Questionnaires: Helping the Students Learn the Basic Course Concepts ................................................................................................................................. 1846
Marta Gatius, Universitat Politecnica de Catalunya, Spain

Using e-Learning to break geographical barriers in access to professional development: A Brazilian research report .............................................................. 1851
Camilla Guarnieri, University of São Paulo and University of South Florida, United States; Jack Drobsz, 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

Going online; a shift from teacher-centered to student-centered teaching and how to facilitate ............................................................................................................... 1856
Oddlaug Marie Lindgaard, Nord University/Tampere University of Applied Sciences, Norway

Digital Mental Health Resources for Children and Youth - Evaluation of Strengths in User Interface Design ........................................................................................................... 1863
Saana Mehtälä, Marja Kankaanranta, Rebekah Rousi & Kati Clements, University of Jyväskylä, Finland

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
Anita Walasiewicz & Heidi Ylitie, Tampere University of Applied Science (TAMK), Netherlands

Opening the Book on the Price of Student Reading Lists ................................................. 1877
Eamon Costello, Richard Bolger, Tiziana Soverino, Mark Brown & Gráinne Conole, Open Education, DCU, Ireland

Designing mobile learning to create active learning and just-in-time learning experience ................................................................................................................................. 1882
Xiaorui Sun, Ohio University, United States

Mobile device integration in self-studying English as a foreign language for non-native English speaking learners: A case study on Japanese learners ........................................... 1891
Thuy Thi Thanh Nguyen & Takashi Yukawa, Knowledge System Laboratory, Nagaoka University of Technology, Japan
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; Oloyede Ojo & Kemi Olajumoke Adu, University of Fort Hare, South Africa

Role of Trial Lessons and Teaching Practice to Develop Skills for Utilizing ICT in Science Education ................................................................. 1940
Satoru Fujitani, Mejiro University, Japan; Takeshi Kitazawa, Tokyo Gakugei University, Japan; Toru Fukumoto, National Institute of Educational Policy Research, Japan