# TABLE OF CONTENTS

**Best of Austria: OER-Certification for Higher Education** .......................................................... 1  
*Martin Ebner, Graz University of Technology, Austria*

**Best of Germany: A Cooperative Approach to the Challenges of Implementing e-Assessments** ........................................................................................................................................ 7  
*Dorothe Meister, Gudrun Oevel & Marcel Graf-Schlattmann, Paderborn University, Germany*

**A Teacher Professional Development Platform in the Big Data Trend: The Development and Application of “TEAM Model Smarter Discussion Room”** ........................................... 16  
*I-Hua Chang, Department of Education, National Chengchi University, Taiwan; Cheng-Mei Hsu, Department of Visual Communication and Design, China University of Technology, Taiwan; Chuan-Wei Wu, HABOOK Information Technology Incorporate, Taiwan*

**An exploratory study of student online collaborative writing with teacher metacognitive prompts** ........................................................................................................................................ 29  
*Marie-Claude Gauthier & Thierry Karsenti, University of Montreal, Canada*

**Collaborative OpenCourseWare Authoring: The SlideWiki Platform** ........................................ 37  
*Alexander Mikroyannidis, The Open University, United Kingdom*

**Quiet! I'm Reading: Texting in eBooks** .......................................................................................... 40  
*Glenn Smith, University of South Florida, United States; Robert Haworth, University of Western Ontario, Canada; Beth Jordan & Diane Austin, University of South Florida, United States*

**Using Technology to Support Common Core Based Close Reading Strategy: Preservice Teachers’ Experiences with the Use of New Online Platform** ......................................... 45  
*Aslihan Unal, Georgia Southern University, United States; Zafer Unal, USF St. Petersburg, United States; Yasar Bodur, Georgia Southern University, United States*

**Online Publications: The Success and Saga** .................................................................................... 53  
*Lindy Alan Valdez, California State University, Sacramento, United States*

**A graph-based recommender system for training groups in the professional context** ........................................................................................................................................ 58  
*Laurie Acensio, Université Lille 1UMR CNRS 9189 CRISTAL, France; Frédéric Hoogstoel, Polytech'Lille-Université de Lille, Lille, France, France; Luigi Lancieri, Université de Lille-Equipe NOCE, Laboratoire d'Informatique Fondamentale de Lille (LIFL), France*

**Predicting and Assessing Student Motivation and Autonomy in a Distance Learning Context** ........................................................................................................................................ 63  
*Dikagma Bassagou, Frédéric Hoogstoel & Luigi Lancieri, CRISTAL - Centre de Recherche en Informatique, France*
Using Self-Regulated Learning Strategies in a Flipped Learning to Improve Students’ Metacognition
Amani Bin Jwar, SIU, United States

LearningCircle.io: Lessons Learned from Organising Courses with and without a Dedicated Platform.
Hanna Celina, Clement Lee, Patrick Olivier & Ahmed Kharrufa, Newcastle University, Open Lab, United Kingdom

Integrative analog-to-digital feedback system
Hyeon Woo Lee & Yoon Mi Cha, Sangmyung University, Korea (South); Hye Yeon Lee, Pennsylvania State University, United States; Eun Jin Kim & Kibeom Kim, Sangmyung University, Korea (South)

Development and evaluation of the food education support system for the purpose of improving the awareness of eating habits in Japan and China.
Hiroshi Nakayama & Yuuki Shimizu, Tokyo Denki University, Japan; Abdusalam Dawut, Xinjiang University, China

Implementation and evaluation of an information moral education system through the experience of a perpetrator and a victim by VR and feedback method
Hiroshi Nakayama & Daichi Takishima, Tokyo Denki University, Japan; Toshiki Matsuda, Tokyo Institute of Technology, Japan

Collaborative Document Authoring as an E-Learning Component
Nikolai Scerbakov & Frank Kappe, Institute of Interactive Systems and Data Science, Graz University of Technology, Austria; Vadim Pak, Institute of Computer Science and Technology, Saint-Petersburg Polytechnic University, Russian Federation

Social Bookmarking as a Component of E-Learning
Nikolai Scerbakov & Frank Kappe, Institute of Interactive Systems and Data Science, Graz University of Technology, Austria; Alexander Schukin, Institute of Computer Science and Technology, Saint-Petersburg Polytechnic University, Russian Federation

An Open Learning Analytics Systems Ensuring Students’ Privacy
David Sichau, ETH Zurich, Switzerland; Lukas Fässler, ETH Zürich, Switzerland

How Engaged are Our Students? Using Analytics to Identify Students At-risk
Tony Williams, Jason Morton, Peter Kilgour & Maria Northcote, Avondale College of Higher Education, Australia

Investigating the Effect of Using E-portfolio On Preservice Teachers’ Self-efficacy, Proficiency and Intention to Use Technology in their Future Classroom
Mohamed Ibrahim & Rebecca Callaway, Arkansas Tech University, United States
Using E-Portfolios: A Key tool for Students’ to Qualitatively Witness their Journey of Growth 141
Christine Sabieh, Notre Dame University, Lebanon; Raphaelle Maria Akhras, American University of Beirut, Lebanon

Exploring Mobile Learning with High School Students in a Remote Area of Peru 152
Linda Chmiliar, Athabasca University, Canada

Georeferenced Learning Activities: An Experience with Moodle 160
Juan P. de Castro, Adrián Rodríguez, María J. Verdu, Luisa M. Regueras, Francisco Merino & Ignacio Molina, University of Valladolid, Spain; Luis C. Pastor, IES Antonio Machado, Spain; José M. Ramos, IES Juan de Juni, Spain

Exploratory analysis of students’ perception in regard to using educational tools in the class-using activity theory 169
Shadi Esnaashari, Lesley Gardner & Michael Rehm, University of Auckland, New Zealand

Is Participatory Pedagogy Useful and Satisfying for Tertiary Students? 179
Shadi Esnaashari & Lesley Gardner, University of Auckland, New Zealand; paul Watts, La Trobe University, Australia

Students’ perceptions of using technology in flipped classrooms environment 190
Shadi Esnaashari, Lesley Gardner & Michael Rehm, University of Auckland, New Zealand

Mobile Apps for Teacher Education: Identifying Social, Cognitive, and Teaching Presences in Interactions via WhatsApp 200
Glenda Gunter, University of Central Florida, United States; Junia de Carvalho F. Braga, Federal University of Minas Gerais, Brazil, Brazil

Exploring the Use of Mathematics Apps for Elementary School Students 206
Robin Kay, UOIT, Canada; Sharon Lauricella, University of Ontario Institute of Technology, Canada

Multimedia application to assist elders in learning to use e-banking services 212
Wellemnah Montshiwa & Johnson Dehinbo, Tshwane University of Technology, South Africa

Innovative Didactic Laboratories and School Dropouts - Second Year Evaluation 220
Carole Salis, CRS4 Research Centre Sardinia, Italy; Marie Florence Wilson, Stefano Leone Monni, Giuliana Brunetti, Fabrizio Murgia & Franco Atzori, crs4, Italy
Developing e-learning system for English conversation practice using speech recognition and artificial intelligence ................................................................. 226
Makoto Shishido, Tokyo Denki University, Japan

Integration of active methodologies with the reuse of shared online videos ................................................................................................................................. 232
Rosa Arruabarrena, Ana Sánchez, José Miguel Blanco, José Ángel Vadillo & Imanol Usandizaga, University of the Basque Country, UPV/EHU, Spain

Being chatty is allowed: Design implications of an innovative online reading experience ............................................................................................................................... 238
Beth Jordan, University of South Florida Health, United States; Glenn Smith & Diane Austin, University of South Florida, United States

Cooperative vs collaborative group work: educational use of social media and social connection for international students .............................................................. 244
Jade Sleeman, Catherine Lang & Eva Dakich, La Trobe University, Australia

Assessment with Technology Integrated Menus: Creating a Bridge Between Traditional and Student-Centered Learning ........................................................................... 250
Sarah Barksdale, University of Minnesota, United States

Assessing Student Learning Using Universal Design for Learning (UDL) Approaches ................................................................................................................................. 256
Debra K Bauder, University of Louisville, United States; Susie Gronseth, University of Houston, United States; Thomas Simmons, University of Louisville, United States

Examining the usability of images in the design of a web-based progress monitoring system for students who are Deaf / Hard of Hearing ........................................ 270
Simon Hooper & Rayne Sperling, Penn State University, United States; Susan Rose, University of Minnesota, United States; Jian Liao, Michelle Hepfer, Xinyur Li & Anne Marie Gardner, Penn State University, United States

Assessing Pre-Service Teachers' Professional Identify Formation: Visually Representing the Teacher Self through Drawings ................................................................. 277
Sara McNeil, Susie Gronseth & Haoyue Zhang, University of Houston, United States

Design Thinking for Inclusive Community Design: (How) Does it Work? ................................. 284
Stefanie Panke, University of North Carolina at Chapel Hill, United States; Thilo Harth, Wandelwerk, Fachhochschule Münster, Germany
# Recruitment Gaming: Propositions to Users and Implications for Universities

Gavin Porter, University of Hong Kong, Hong Kong

---

# A Methodological Approach to Evaluate the Effectiveness of Learner-Generated Digital Media (LGDM) Assignments in Science Education

Jorge Reyna, University of Technology Sydney, Australia; Jose Hanham, Western Sydney University, Australia; Peter Meier, University of Technology Sydney, Australia

---

# Conceptual Gaps in Mathematics as a Research Base for a Successful Game-based Mathematics Intervention

Karin M. Wiburg, Institute for Equity/Excellence in Math and Science Education/New Mexico State University, United States; Carolyn Raynor, New Mexico State University, United States

---

# Drawing Analysis of High School Students’ Conception of Technology-Assisted Science Learning, and Its Relation to Conception of Science Learning

Heng-Yi Yeh, Yu-Hsiang Tsai & Hsin-Yi Chang, National Taiwan University of Science and Technology, Taiwan; Chin-Chung Tsai & Min-Hsien Lee, National Taiwan Normal University, Taiwan

---

# Impact Study of Tourism Destinations’ eLearning: The Case of the Switzerland Travel Academy

Nicole Regazzoni, Nadzeya Kalbaska & Lorenzo Cantoni, Università della Svizzera italiana, Switzerland

---

# Ensuring Quality in Higher Education through Assessment Practices

Satya Sundar Sethy, Indian Institute of Technology Madras, India

---

# Exploring Cross-Cultural Digital Competencies: Building the Global Educational Learning Observatory, GELO

Roland van Oostveen, Maurice DiGiuseppe, Wendy Barber & Todd Blayone, University of Ontario Institute of Technology, Canada; Elizabeth Childs, Royal Roads University, Canada

---

# Learning Outcomes and Program Mapping: Tools for Transparent Assessment

Jo Axe, Elizabeth Childs & Sophia Palahicky, Royal Roads University, Canada

---

# Automatic Generating of Differentiated Assessment Tests within Higher Educational Context

Richardson Ciguene, Céline Joiron & Gilles Dequen, Laboratory MIS from University of Picardy Jules Verne, France; Ben Manson Toussaint, Laboratory SITERE from Ecole Supérieure d’Infotronique d’Haiti, Haiti
Multi-dimensional Approach for the Pedagogical Assessment in STEM Technology
Enhanced Learning ........................................................................................................... 378
Lydia Montandon, Atos Spain, Spain; Jim Playfoot, White Loop Limited, United Kingdom; Ioana Ghergulescu, Adaptemy, Ireland; Marilena Bratu, University of Bucharest, Romania; Diana Bogusevschi, Dublin City University, Ireland; Renata Rybarova, Slovakia Technical University, Slovakia (Slovak Republic); Nour El Mawas, National College of Ireland, Ireland

From learning to teaching analytics: using the data collected in class to increase visible participation ......................................................................................................................... 384
Emmanuel Zilberberg, ESCP Europe / CREF (Paris XII), France; Cristina Davino, University of Naples Federico II, Department of Economics and Statistics –, Italy

Exploring Students’ Eye Movements to Assess Learning Performance in a Serious Game .................................................................................................................................. 394
Asma Ben Khedher, Imène Jraidi & Claude Frasson, University of Montreal, Canada

Evidence of Computational Thinking in the After-School Makerspace from Written Project Documentation ..................................................................................................... 402
Kevin Oliver & Jennifer Houchins, North Carolina State University, United States

Response Justifications as Feedback in Clicker Activities: A Case Study on Student Performance and Calibration ........................................................................................... 408
Pantelis Papadopoulos & Antonis Natsis, Centre for Teaching Development and Digital Media, Aarhus University, Denmark; Nikolaus Obwegeser, Department of Management, Aarhus University, Denmark

Learning Experience Technology Usability Design framework ........................................ 414
Veera Kenttälä, Rebekah Rousi & Marja Kankaanranta, Faculty of Information Technology, University of Jyväskylä, Finland

Technological learning and educational management ecosystems. Thirteen characteristics for efficient design. ......................................................................................................................... 424
Ramon Marti & Merce Gisbert, Universitat Rovira i Virgili, Spain; Virginia Larraz, Universitat d’Andorra, Andorra

Students’ perceptions of ICT use in higher education context ........................................... 431
Teemu Valtosen, Erkko Sointu, Jari Kukkonen & Jenni Kankaanpää, University of Eastern Finland, Finland

A Prototype of a Maker Education Program: Cultivating Entrepreneurship of Adolescents ................................................................................................................................. 440
Seonghye Yoon, LET’s Lab (Leading Educational Technologists’ Lab), Korea (South); JeeEun Jang, Envisible, Inc., Korea (South); Seyoung Kim, Ewha Womans University, Korea (South)
21st Century Values: An Examination of the Attitudes of Finnish Educational Leaders in the Implementation of Digitalization in Finnish Basic Education .......................... 444
Anita Jantunen, Tampere University of Applied Sciences, Finland

Curriculum Flexibility in a Blended Curriculum. ............................................................ 450
Herma Jonker, Windesheim University of Applied Sciences and University of Amsterdam, Netherlands; Virginie März, Université catholique de Louvain, Belgium; Joke Voogt, University of Amsterdam and Windesheim University of Applied Sciences, Netherlands

Becoming Digified - time-related considerations for worthy and appropriate digitalization ....................................................................................................................... 456
Mikael Kivelä, University of Helsinki, Finland

Three Types of Practical Examples of Programming Education at Elementary Schools in Japan .......................................................................................................................... 461
Yuki Kobayashi, Ibaraki University, Japan; Susumu Kanemune, Osaka Electro-Communication University, Japan; Shizuka Shirai, Osaka University, Japan; Hidenari Usui, Nakanohigashi Elementary School, Japan; Takumi Shimizu, Elementary School Attached to Ibaraki University, Japan

Learning in the Age of Distraction .................................................................................. 467
Karl Bernard Sebire, Sue Gregory & Michelle Bannister-Tyrrell, University of New England, Australia

Development of IoT Educational Program for Workers to Meet the Era of the Fourth Industrial Revolution ........................................................................................................ 473
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

Monitor for ICT integration in Flemish education (MICTIVO): Research set-up and some preliminaries ...................................................................................................................... 479
Pieter Jan Heymans, KU Leuven, Research Centre for Information Management; Centre for IP&T, Belgium; Eline Godaert, UGent, Department of Educational Studies, Belgium; Jan Elen, KU Leuven, Centre for Instructional Psychology and Technology, Belgium; Johan van Braak, UGent, Department of Educational Studies, Belgium; Katie Goeman, KU Leuven, Research Centre for Information Management, Belgium

The context of online training, motivations and barriers on following them by travel agents in the United Kingdom, India and New Zealand. .......................................................... 485
Nadzeya Kalbaska & Lorenzo Cantoni, USI – Università della Svizzera italiana, Switzerland

Proposal for Development of Methods to Incorporate Higher-Order Skill in the FAA SMS Certification Program ........................................................................................................ 496
Richard Vranesh, CSSI, United States
FERPA, HIPAA, and Other Privacy Concerns in Online Education ............................................. 519
William Garner, University of Arkansas at Little Rock, United States

Best of Germany: Developing Strategies for Digital Transformation in Higher Education: Not a Trivial Pursuit ................................................................. 524
Michael Kerres & Barbara Getto, University Duisburg-Essen, Germany

An Analysis of Computing-Related Education in the Korean National Curriculum ......................................................................................................................... 531
Soyul Yi & Youngjun Lee, Korea National University of Education, Korea (South)

“... otherwise I will get lost”: Affective aspects of personal information management among preservice teachers .............................................................. 537
Lilach Alon, Tel Aviv University, Israel; Alona Forkosh Baruch, Levinsky College of Education, Tel Aviv University, Israel; Rafi Nachmias, Tel Aviv University, Israel

Cross-cultural Design and Development of Courses for Faculty ........................................ 548
Anne-Marie Armstrong & Arturo Ocampo, Universidad Autónoma del Estado de Hidalgo (UAEH), Mexico

Retooling 3D documentation technology for education: A review of photogrammetry technique used as a guideline for digitizing objects in K-12 education ........................................ 572
Melis Balo#lu A#ut, Istanbul Technical University, PhD candidate, Turkey

The Tipping Point: On Making Technological Innovation in the Higher Education Classroom the Norm ................................................................. 588
Zarina Mariam Charlesworth, School of Management & Engineering Vaud, HES-SO // University of Applied Sciences W. Switzerland, Switzerland

The Scholarship of Technology Enhanced Learning: Reimagining SOTL for the Social Network Age. ........................................................................................................ 594
Thomas Cochrane & Vickel Narayan, Auckland University of Technology, New Zealand

Factors affecting pre- and in-service use of technology in teaching: Implications for research and practice – Part 1 .............................................................................. 604
Daan Farjon, University of Amsterdam, Netherlands; Anneke Smits, Windesheim University of Applied Sciences, Netherlands; Joke Voogt, University of Amsterdam/ Windesheim University of Applied Sciences, Netherlands; Gerald Knezek & Rhonda Christensen, University of North Texas, United States; Dominik Petko & Doreen Prasse, Schwyz University of Teacher Education, Switzerland; Jo Tondeur, Vrije Univeristeit Brussel, Belgium; Ronny Scherer & Fazilat Siddiq University of Oslo, Norway; Teemu Valtonen & Erkko Sointu, University of Eastern Finland, Finland; Johan van Braak, Ghent University, Belgium
Instructional materials and students’ learning styles ................................................................. 608
Patricia Fidalgo & Ieda M. Santos, Emirates College for Advanced Education, United Arab Emirates; Joan Thormann, Lesley University, United States

Kissed by the Muse: Promoting Computer Science Education for All with the Calliope Board ............................................................................................................................................... 612
Maria Grandl & Martin Ebner, Graz University of Technology, Austria

Making a Case for Digital Inquiry: Using Wearable Video Technology to Engage in Perspective Taking and Inquiry ........................................................................................................................................ 622
Cassidy Hall, University of Idaho, United States; Ricky Mullins, Virginia Tech, United States; Melinda Davis & Jaap Vos, University of Idaho, United States

Development of Automatic Language Classroom Analysis System ........................................... 626
Hiroki Ishizuka, Hokkaido University of Education, Asahikawa Campus, Japan; Ronald Klbler, Hokkaido Komazawa University, Japan

Latin American International School Faculty Uses and Gratifications of Technology .......................................................................................................................................................................... 631
Liliana Julio, Universidad Simon Bolivar, Colombia; Erik Kormos, Colegio Karl C Parrish, Colombia; Adam Morgan & Taylor Dopuch, Colegio Karl C. Parrish, Colombia

Exploring Local Public Places: Geography Fieldwork and Story Maps with Preservice Teachers ............................................................................................................................................. 637
Todd Kenreich, Towson University, United States

Reflective Practice of Pre-service Mathematics Teachers in an Asynchronous Online Discussion Forum ........................................................................................................................................ 643
Wilfred W.F. Lau, The Chinese University of Hong Kong, China

Investigation and Analysis of TPACK Status of STEM Teachers in China ............................... 648
Shuaishuai Li, East China Normal University, Department of Education, Department of Educational Technology, China

The beliefs of high school preservice teachers about their role in the development of students’ digital competence. ......................................................................................................................... 653
Jean Gabin Ntebutse, Charles Bourgeois & Amanda Lopez, Université de Sherbrooke, Canada

An exploratory study on Happiness from Happiness Education for Teacher ................................................................................................................................................................................. 659
Bokmi Park & Jungeun Woo, Seoul National University, Korea (South); Yunhee Lee, Seoul national univetsity, Korea (South)
“Call me Storyteller”: Using Poetry to Remix the Digital Storytelling Process ................................................................. 661
Joe Sanchez, Queens College, United States

Best of Finland: Perspectives for the Pre-service Teachers’ Readiness to Take Advantage of ICT in Education ................................................................................................. 667
Teemu Valtonen, Erkko Sointu & Jari Kukkonen, University of Eastern Finland, Finland; Kati Makitalo, Oulu University, Finland

Preparing (student-)teachers in using technology in their teaching: An international perspective – Part 1 .................................................................................................................. 675
Joke Voogt, University of Amsterdam/Windesheim University of Applied Sciences, Netherlands; Henk Sligte, Kohnstamm Instituut, Netherlands; Anneke Smits, Windesheim University of Applied Sciences, Netherlands; Ottavia Trevisan & Marina de Rossi, University of Padua, Italy; Erkko Sointu & Teemu Valtonen, University of Eastern Finland, Finland; Matthew C. Lambert, University of Nebraska-Lincoln, United States; Jenni Kankaanpää, Laura Hirsto & Kati Mäkitalo-Siegl, University of Eastern Finland, Finland; Jo Tondeur, Vrije Universiteit Brussel, Belgium

An Efficient Supportive Approach to Improve Online Course Quality ........................................ 679
Xuemei Li, Norfolk State University, United States

Experiences of teachers in an online course on the PBL approach: the perception of the teacher's role in the digital age ........................................................................................................... 682
Orit Avidov-Ungar, The Open University, Israel & Achva Academic College, Israel, Israel; Dina Tsybulsky, School of Education, Achva Academic College, Shikmim, Israel & School of Education, Tel-Aviv Univers, Israel

Flexible Learning: Examining a Competency-Based Program .................................................. 692
Kim Livengood & Raelye Self, Angelo State University, United States

"And That's How It All Began": A Qualitative Exploration of Factors of Motivation in Early Experiences with Learning Computer Science ......................................................... 697
Sadia Sharmin, University of Toronto, Canada

The Effect of a Teacher’s Belief System on Online Japanese Course Development .......................................................... 703
Mayumi Shibakawa, University of Shiga Prefecture, Japan

Summative Evaluation of a Script-based Distance Training Course on Media Pedagogy for Teachers ................................................................. 709
Klaus Stiller & Regine Bachmaier, University of Regensburg, Germany
Evaluating the Effectiveness of Animated Cartoons in an Intelligent Math Tutoring System Using Educational Data Mining ................................................................. 719
Giora Alexandron, Weizmann Institute of Science, Israel; Gal Keinan, Ben Levy & Sara Hershkovitz, The Center for Educational Technology, Israel

A Messaging Framework for Online Educators ............................................................. 731
Karen Gebhardt & Kelly McKenna, Colorado State University, United States

Should You Go for Smartphones at School? How the Use of Modern Media in Class Influences IT-Competences ...................................................................................... 736
Walther Nagler, Maria Grandl, Maria Haas, Martin Schöö & Martin Ebner, Educational Technology, Graz University of Technology, Austria, Austria

The Impact of Additional Early Feedback on Doctoral Capstone Proposal Approval ............................................................................................................................. 745
Michelle Stallone Brown & Beate Baltes, Walden University, United States

Collaborative Evaluation of the use of curriculum mapping to track program learning outcomes ............................................................................................................. 751
Davina DeVries & Beth Jordan, University of South Florida Health, United States

A Case Study of Quality Management for Online Education Performance Improvement in Korea. ............................................................................................................. 753
Hyeon Dae Rha, Hoi Seok Yang & Byeong Jun Ju, Soongsil University Graduate School of IP Policy and Management, Korea (South)

A Study on the Classification of Online Education Types and Development of Quality Management Indicators for Lifelong Vocational Skills Development ................. 759
Hyeon Mi Rha, Korea Research Institute for Vocational Education & Training, Korea (South)

Taking full advantage of life in 21st century Canada: Developing the skills needed to be an active and responsible global digital citizen ......................................................... 764
Michel Leger, Takam Djambong, Manon LeBlanc & Viktor Freiman, Université de Moncton, Canada

Supporting Cultural Connections, Collections, and Reflections through Technology in Short-Term Study Abroad .................................................................................. 769
Kevin Oliver & Angela Wiseman, North Carolina State University, United States; Michael Cook, Auburn University, United States

Cultural Aspects and Online Pedagogy: Building International Learning Communities in an Online Educational Leadership Degree Programme ........................................ 777
Farida Danmeri, Harue Dozono, Barbara Tajti & Päivi Mayor, Tampere University of Applied Sciences, Finland
Research-Based Implications for Policy and Practice: Outcomes from EduSummIT 2017 – The Fifth International Summit on Information Technology in Education – Part 1

Gerald August Knezek, University of North Texas, United States; Joke Voogt, University of Amsterdam, Netherlands; Rhonda Christensen, University of North Texas, United States; Koos Eichhorn, Lucas onderwijs, Netherlands; Henk Sligte, Kohnstamm Institute for Educational Research, Netherlands; Rowland Baker, Santa Cruz County Office of Education, United States; Dominik Petko, Pädagogische Hochschule Schwyz, Switzerland; Miri Shonfeld, Kibbutzim College of Education, Israel; Anneke Smits, Windesheim University of Applied Sciences, Netherlands; Dirk Ifenthaler, University of Mannheim, Germany; Mary Webb, King’s College London, United Kingdom; Jo Tondeur, Vrije Universiteit Brussel, Belgium; Sarah Howard, University of Wollongong, Australia

Using students’ reflections to understand their perceptions in introductory programming learning

Anabela Gomes, Centre for Informatics and Systems – Univ. Coimbra & Engineering Institute of Polytechnic of Coimbra, Portugal; Maria José Marcelino & António José Mendes, Centre for Informatics and Systems – Univ. Coimbra, Portugal

Trend Analysis and Implications of Converged Education Research for Computational Thinking Improvement

Eunwoo Joung & Youngjun Lee, Korea National University of Education, Korea (South)

Best of Austria: Austria’s Higher Education e-Learning Landscape - Summary of the Status Quo

Hans-Peter Steinbacher, University of Applied Sciences Kufstein, Austria

Reflecting on Challenges of Conducting Design-Based Research in Large University Courses

Naemi Luckner, Peter Purgathofer & Geraldine Fitzpatrick, TU Wien (Vienna University of Technology), Austria

Development of Instructional Design Strategies for a Physical Computing Program to Enhance Creative Problem Solving

Taejung Park, Hankuk University of Foreign Studies, Korea (South); Kwangil Kim, CAC Inc., Korea (South)

Dancing Between Pedagogy, Andragogy and Heutagogy: Dance as a Metaphor for the Learning Relationship Between Post-Graduate Learners and Faculty

Mark Rasi, Queensland University of Technology, Australia

Still Relevant? Gagné’s Nine Events of Instruction in the Online World

Monica Surrency, University of North Texas (Denton) & Embry-Riddle Aeronautical University Worldwide, United States; Donna Barbie, Embry-Riddle Aeronautical University, United States
Integrating Informal Learning within a Formal Instructional Design Degree Program: A Design-Based Research Approach .............................................................. 841
Boshra Zawawi, George Mason University, United States

Developing a Marker-based Handheld Augmented Reality Application for Learning Mathematics .............................................................................................................. 856
Mawuli Akussah & Johnson Dehinbo, Tshwane University of Technology, South Africa

AR-based Science Exploration Using Smart Glass ................................................... 867
Ming-Puu Chen, National Taiwan Normal University, Taiwan; Yi-Husan CHEN, Soochow University, Taiwan; Chia-Hung Cheng, National Taiwan Normal University, Taiwan

A digital theater for drama based learning in the classroom ................................. 869
Sung-en Chen, Yuan-Fu Lou, Wei-Yi Wu & Yu-Fang Liu, Department of Computer Science and Information Engineering National Central University, Taiwan, Taiwan; Gwo-dong Chen, Department of Computer Science and Information Engineering National Central University, Taiwan, Taiwan

The preferred situational context scenario type for drama based learning experience in digital theater. ................................................................. 875
Mahesh Udayanga Liyanawatta, Yu-fang Liu, Yu-Tzu Liu, Yen-Hua Chen & Gwo-dong Chen, Department of Computer Science and Information Engineering, National Central University, Taiwan

Informal Learning and Augmented Reality: A Review of the Literature ............... 886
Mark Petrovich, Mamta Shah & Aroutis Foster, Drexel University, School of Education, GLIDE Lab, United States

Augmented Reality Games and Motivation in Language Learning ...................... 892
Ayse Taskiran, Anadolu University, Turkey

Creative Use of Augmented Reality (AR) in the Classroom: A Synopsis of Three Empirical Studies ................................................................. 899
Daniel Tillman, Alyse Hachey & Song An, The University of Texas at El Paso, United States

Using Mobile Makerspaces to Support Classroom-based Augmented Reality (AR): A Scalable Framework for Encouraging Creativity and Innovation ......................... 905
Daniel Tillman, The University of Texas at El Paso, United States; Shaunna Smith, Texas State University, United States

The Effects of an Educational Augmented Reality Application on the Interpretation and Communication of Cultural Assets: The “Greek Type” Watermill’s Case ................ 909
Stavroula Tzima & Georgios Styliaras, Dept. of Cultural Heritage Management and New Technologies, University of Patras, Greece; Harilaos Zaragas, Dept. of Early Childhood Education (E.C.E.D.U.), University of Ioannina, Greece; Athanasios Bassounas, Regional Directorate of P&S Education of Epirus, Greece
Proposing an augmented reality-based system for writing instruction ....................... 926
Yi Hsuan Wang, Department Educational Technology Tamkang university, Taiwan

New Age Leaders .............................................................................................................. 932
Caroline Akhras, Notre Dame University, Lebanon

Preservice Teachers’ Practices in Social Digital Curation: Towards Authentic Learning ............................................................................................................................. 942
Rivka Gadot, Tel-Aviv University, Levinsky College of Education, The Open University of Israel, Israel; Alona Forkosh Baruch, Levinsky College of Education, Tel-Aviv University, Israel

Ian Glover & Kieran McDonald, Sheffield Hallam University, United Kingdom

Building and Evaluating Education and Outreach Programs for an NSF Engineering Research Center, the Center for Bio-mediated and Bio-inspired Geotechnics (CBBG) ................................................................................................................................ 960
Wilhelmina Savanye, Jean Larson, Claudia Zapata, Edward Kavazanjian, Kristin Elwood, Wendy Barnard, Megan O’Donnell, Jennifer Chandler, Delia Saenz, Miriam Woolley & Leon Van Paassen, Arizona State University, United States; Colleen Bronzer, Jason DeJong & Alejandro Martinez, University of California - Davis, United States

Towards Serving the Data Warehousing/Business Intelligence Industry Better: Enrichment of a Postgraduate Course ............................................................................... 966
Carin Venter, North-West University, South Africa

Theoretical Considerations for Design-based Learning from Gender Awareness Perspective in Korean Engineering Education .............................................................. 976
Mi Kyung Cho, Seyoung Kim, Jiyoon Moon & JiYoung Lim, Ewha Womans University, Korea (South)

Role of Video Lectures in A Flipped Classroom: How Is Knowledge Applied in Collaborative Learning? ........................................................................................................... 985
Wakako Fushikida, Tokyo Metropolitan University, Japan; Hiroki Oura, Tokyo Institute of Technology, Japan; Ryota Yamamoto & Yuhei Yamauchi, The University of Tokyo, Japan

Expanding Idea Generation Capability for Engineering Students in Design Thinking Workshops via Science Fiction Stories ................................................................. 998
Ayumi Kizuka, Faculty of Arts, Osaka University of Arts, Japan; Kazuhiko Sato, College of Information and Systems, Muroran Institute of Technology, Japan; Yoshiaki Mima & Hidekatsu Yanagi, Faculty of Systems Information Science, Future University Hakodate, Japan
Improving Learning, Motivation and Self-regulation in Vocational Education with Goal-based Learning in an Augmented Reality Setting ................................................................. 1004
Stefan Ludwigs & Elke Brenstein, Rheinische Fachhochschule Köln/University of Applied Sciences Cologne, Germany

I need a Training Program! Gamification of Online Case-based Learning ................. 1011
Elena Novak & Mila Rosa Librea-Carden, Kent State University, United States; Yonita Weiszhauc, Stow-Munroe Falls High School, United States

Technology Integration in a Foreign Language Course Using a Collaborative Action Research .......................................................................................................................................................... 1018
Ieda M. Santos, Emirates College for Advanced Education, United Arab Emirates

Using Emerging Technology in Industry-Based Project for Education .................... 1026
Ann Stevens, TAFE Queensland Gold Coast Region, Australia; Gabriel Deragopian, Orora Limited, Australia

Framework for Designing an OILE for Complex Dynamic Systems ....................... 1032
Aklilu Tilahun Tadesse, University of Bergen, Norway

An Online Experiment of Using Case Studies and Scenarios to Teach Preservice Teachers About the Code of Ethics ........................................................... 1047
Zafer Unal, USF St.Petersburg, United States; Aslihan Unal & Yasar Bodur, Georgia Southern University, United States

Communication Education Program - Collaborative project with elderly persons by creating digital storybooks - ........................................................... 1057
Taeko Ariga, Doshisha Women's College of Liberal Arts, Japan; Koichi Mori, Doshisha Women's College of Liberal Arts, Japan; Takehisa Mashimo, Seian University of Art and Design, Japan; Nahoko Kusaka, Doshisha Women's College of Liberal Arts, Japan

Learning Together: Strategies for Supporting Collaborative Learning in Online Courses from a Universal Design for Learning Perspective ................................................. 1068
Susie Gronseth, University of Houston, United States; Debra K Bauder, University of Louisville, United States

The Value and Necessity of Programming Communication Ability in Informatics Education ........................................................... 1082
Jeongmin Han, Soyul Yi & Youngjun Lee, Korea National University of Education, Korea (South)

The Collaborative Design of Massive Open Online Courses: Analyzing the Design Discourses of Teacher and Student Developers .................................................. 1087
Sara McNeil, Susie Gronseth, Erwin Handoko & Bernard Robin, University of Houston, United States
Primary Pre-service Teachers as Learning Designers of Collaborative Activities with ICT ................................................................. 1094
Adolfina Pérez Garcias, Universitat de les Illes Balears, Spain; Victoria I Marín Juarros, Carl von Ossietzky Universität Oldenburg, Germany; Gemma Tur & Alexandra Lizana, Universitat de les Illes Balears, Spain

Do We Learn More with Explicit References? A Closer Look at the Learning Protocol Approach to Chat-based CSCL ................................................................. 1102
Madeleine Ratter & Michael Oehl, Leuphana University Lueneburg, Germany

Guiding User’s Attention in Chats: Evidence from Eye Movement Analysis ...................................................................................... 1107
Madeleine Ratter & Michael Oehl, Leuphana University Lueneburg, Germany

The role of computer programming as a partner in the English classroom .................................................................................. 1113
Sandra Costa, Externato São Domingos (Fátima), Portugal; Miriam Santos & Pedro Abreu, Centre for Informatics and Systems (Univ. Coimbra), Portugal; Teresa Pessoa, Faculty of Psychology and Educational Sciences (Univ. Coimbra), Portugal; Anabela Gomes, Centre for Informatics and Systems (Univ. Coimbra) & Engineering Institute (Polytechnic of Coimbra), Portugal

Collaborative course design with faculty, instructional designer, and students for program development ................................................................. 1123
Beth Jordan, Gwendolyn Wantuch, Adriana Hughes & Sarah Jacob, University of South Florida Health, United States; Jordan Sachmann, University of South Florida, United States

Building a Community of Students in Moodle .......................................................................................................................... 1125
Niila Tamminen & Johanna Henriksson, Humak, Finland

Using Gamification to Foster Intrinsic Motivation and Collaborative Learning: A Comparative Testing ................................................................. 1128
Klaudia Bovermann & Theo Bastiaens, FernUniversität in Hagen, Germany

The role of elementary school students’ scientific epistemic beliefs in a digital game-based learning environment ................................................................. 1138
Ying-Ju Chiu, National Taiwan University of Science and Technology, Taiwan; Chung-Yuan Hsu, National Pingtung University of Science and Technology, Taiwan; Jyh-Chong Liang, Tzungs-Jin Lin & Chin-Chung Tsai, National Taiwan Normal University, Taiwan

Impact of Game-Based Student Response Systems on Factors of Learning in a Person-Centered Flipped Classroom on C Programming ................................................................. 1143
Dominik Dolezal, University of Applied Sciences Technikum Wien, Austria; Alexandra Posekany, Danube University Krems, Austria; Renate Motschnig, University of Vienna, Austria; Theresa Kirchweger & Robert Pucher, University of Applied Sciences Technikum Wien, Austria
A Virtual Escape Game for Intergenerational Play: Exploring Social Interactions and Intergenerational Perceptions
Amir Doroudian & David Kaufman, Simon Fraser University, Canada

A Case Study on 21st Century Skills Development Through a Computer Based Maths Game
Nour El Mawas, Michael Bradford, Josephine Andrews, Pramod Pathak & Cristina Hava Muntean, National College of Ireland, Ireland

Incorporating quizzes into a 3D educational game calling web services
Margaritis Kamitsios & Spyros Papadimitriou, University of Pireaus, Greece; Konstantina Chrysafiadi & Maria Virvou, University of Piraeus, Greece

NordHunt – gamification for a smooth start of university life
Line Kolås, Hugo Nordseth, Ståle André Nygård & Trond Olav Skevik, Nord University, Norway

Gamification of Circuit Laws – Kirchhoff’s Revenge
Gerd Kortemeyer, Michigan State University, United States

Gameful Design Principles for Self-Learning in Gamified eLearning Systems
Marco Lindley & Pedro Isaias, Institute for Teaching and Learning Innovation - University of Queensland, Australia

Alien Rescue: A 3D Problem-Based Learning Game
Min Liu, University of Texas at Austin, United States; Chenglu Li, The University of Texas at Austin, United States; Zilong Pan, li.chenglu@utexas.edu, United States

Students as Creators of Educational Games - Learning to Use Simple Frameworks and Tools to Empower Students as Educational Game Designers
Ana Rute Martins & Lia Raquel Oliveira, CIEd – Research Centre in Education, Institute of Education, University of Minho, Portugal

‘Throw and Run’ Early-Human Virtual Hunting Experience: An Interactive Archaeology-Learning Support System
Natsuki Sako, Tokyo University of Science, Japan; Takanori Ozawa, Tama Art University, Japan; Ryohei Egusa, Meiji Gakuin University, Japan; Masanori Sugimoto, Hokkaido University, Japan; Fusako Kusunoki, Tama Art University, Japan; Shigenori Inagaki, Kobe University, Japan; Hiroshi Mizoguchi, Tokyo University of Science, Japan

German Language Training App for Primary School Children
Alexander Schwaiger, Markus Ebner & Martin Ebner, Graz University of Technology, Austria
Learning Climate Change Science with Computer Games in a Science Fiction Novel ................................................................. 1231
Glenn Smith & Metin Besalti, University of South Florida, United States

Development of Embodied Subitizing During Interactions with a Multi-Touch Digital Game ................................................................. 1236
Stephen I Tucker, University of Louisville, United States; Teri N Johnson, Virginia Commonwealth University, United States

Developing game-based learning materials for classical Chinese learning ............................................................................................................................. 1242
Yi Hsuan Wang, Department Educational Technology Tamkang university, Taiwan

The Relationship Between Learning Styles and Creativity Students: An Information Visualization Class Case Study ................................................................. 1246
Pedro Abreu, Pedro Martins, Penousal Machado & Joel Arrais, Centre for Informatics and Systems (Univ. Coimbra), Portugal; Anabela Gomes, Centre for Informatics and Systems (Univ. Coimbra) & Engineering Institute (Polytechnic of Coimbra), Portugal

A Language Facilitator, a Self-Regulation Activity and a Social Gateway: Blog Use of Primary School Students with Special Needs ................................................................. 1256
Merav Asaf, Kaye Academic College of Education, Israel; Rachel Shwartz-Gorali, Omarim School, Kaye Academic College of Education, Israel

Measuring Engagement: Different focus, different results ................................................................. 1262
Julie Bonner, Jaclyn Krause & Laura Portolese, Central Washington University, United States

A Situational Comic Play Drama Learning System to Enhance Students’ Learning Motivation ................................................................................................................................. 1269
Ping-Yu Chiang, Chun-Hsien Lee, Szu-Hua Lin, Cheng-Yu Fan, Yen-Hua Chen & Gwo-Dong Chen, National Central University, Taiwan

Flipped classroom learning in a first-year undergraduate engineering course ................................................................................................................................. 1275
Elaine Khoo & Mira Peter, Wilf Malcolm Institute of Educational Research, Faculty of Education, University of Waikato, New Zealand; Jonathan Scott & Howell Round, School of Engineering, Faculty of Science and Engineering, University of Waikato, New Zealand

Increasing and Ensuring Accessibility within an Online Non-Majors Biology Core Course ................................................................................................................................. 1281
Mary Jo Parker, University of Houston-Downtown, United States
Entry Exam as an Online Course for Cultural Management Program in Finland
Niila Tamminen, Humak, Finland

Social comparison and motivation: Experience of being the best versus being one of the better ones
Misook Heo, Duquesne University, United States

From Ephemera to Building Blocks: Capturing New Understandings About Efficacy Beliefs Among Teachers in Learning Communities Using Repertory Grid Elicitation
Ulana Pidzamecky & Roland vanOostveen, University of Ontario Institute of Technology, Canada

E-mentoring and novice teachers’ professional development: Program design and critical success factors
Christina Spanorriga, Panagiotis Tsiotakis & Athanassios Jimoyiannis, University of Peloponnese, Greece

Searching Indirectly for Dyslexics in an L2 Reading Class
Kurt Ackermann, Hokusei Gakuen University Junior College, Japan

Understanding Support System for Kansei of Teacher in Fashion Domain
Nozomu Fukumura & Tomoko Kojiri, Kansai University, Japan

Pre-service Mathematics Teachers’ Attitude towards Integrating Humor in Math Lessons
Avikam Gazit, Kibbutzim College of Education, Israel, Israel

Adaptive Identity Authentication of Blockchain System-the Collaborative Cloud Educational System-
Mayumi Hori & Masakazu Ohashi, Chuo University, Japan

Sustaining Long-Term Student Inquiry with LMS Projects' Spaces
Dorothy Langley, Holon Institute of Technology, Israel; Rami Arieli, Department of Science Teaching, Weizmann Institute of Science, Rehovot, Israel, Israel

Visualizing Relationships among Contents Topics and Learning Activities of Online Courses
Toshiyuki Takeda, Kwansei Gakuin University, Japan; Yasuhiro Hayashi, Teikyo Heisei University, Japan; Katsusuke Shigeta, Hokkaido University, Japan; Hideki Mori, Tokyo Institute of Technology, Japan; Daisuke Kaneko, Hokusei Gakuen University, Japan; Hidefumi Yagi, Tohoku University, Japan; Tomohiro Nagashima, Carnegie Mellon University, Japan
Increasing Learning Efficiency and Quality of Students’ Homework by Attendance Monitoring and Polls at Interactive Learning Videos ................................................................. 1357
Josef Wachtler, Educational Technology - Graz University of Technology, Austria; Marco Scherz, Working Group Sustainable Construction, Institute of Technology and Testing of Construction Material, Austria; Martin Ebner, Educational Technology - Graz University of Technology, Austria

Outcomes from Technology Enhanced Informal Learning Activities to Increase Middle School Students’ Interest in STEM ........................................................................................................ 1368
Rhonda Christensen, Gerald Knezek, Samson den Lepcha, Destiny Dong, Samuel Liu, Karen Wang, Andrew Wu & Huram-Abi Yotchoum Nzia, University of North Texas, United States

Next generation learning - Chuoagogy and technologies to transform lifelong learning ............................................................................................................................. 1378
Leslie Cordie & Michael Wooten, Auburn University, United States

Developing Digital Content that Helps Zoo Visitors Comparatively Observe Animal Exhibits ........................................................................................................................................ 1382
Ryohei Egusa & Riho Ishida, Kobe University, Japan; Shoko Ono & Fusako Kusunoki, Tama Art University, Japan; Etsuji Yamaguchi, Shigenori Inagaki & Tomoyuki Nogami, Kobe University, Japan

A Learner-Centred Approach for Lifelong Learning Powered by the Blockchain ............................................................................................................................... 1388
Alexander Mikroyannidis, John Domingue, Michelle Bachler & Kevin Quick, The Open University, United Kingdom

Differences between learners with different prior knowledge in processing visual and auditory information: An eye-tracking study .................................................................................................................. 1394
An-Hsuan WU & Meng-Jung Tsai, National Taiwan University of Science and Technology, Taiwan

What Do Students Think about Integrating Formal and Informal Learning in Higher Education: A Case Study .................................................................................................................................. 1400
Boshra, Fuad Zawawi, George Mason University, United States

“Alexa, tell me about using a virtual assistant in the classroom” ................................................. 1413
Tonia A Dousay & Cassidy Hall, University of Idaho, United States

Digital Storytelling: Engaging Students Through Multimodal And Interdisciplinary Learning ........................................................................................................................................... 1420
Sangeetha Gopalakrishnan, Wayne State University, United States

Forget about traditional ways of teaching: creativity is in your heart ........................................... 1424
Janaina Minelli Oliveira, Universitat Rovira i Virgili, Spain; Eliana Gallardo Echenique, Universidad Peruana Cayetano Heredia, Peru; Mar Camacho & E dwa r d A . L o c k h a r t, Universitat Rovira i Virgili, Spain; Francesc Esteve, Universitat Jaume I, Spain
Makerspaces as sociotechnical system: Introducing Pre-service Librarians to Making ................................................................. 1435
Joe Sanchez, Queens College, United States

An Analysis of the Stages of Teachers’ Concerns Regarding Education on Mobile Application Development: An Application of CBAM ................................................................. 1441
Seonghye Yoon, LET’s Lab (Leading Educational Technologists’ Lab), Korea (South); Woori Kang, BIPLUG, Inc., Korea (South)

Personalized Long-term Student Guidance Towards Graduation ........................................ 1449
Vangel Ajanovski, Faculty of Computer Science and Engineering, Ss Cyril and Methodius University in Skopje, Macedonia

When Robots Talk - Improving the Scalability of Practical Assignments in MOOCs Using Chatbots .......................................................................................................................... 1455
Lars Bollweg, Maik Kurzke, K M Asif Shahriar & Peter Weber, Fachhochschule Südwestfalen, Germany

Mobile Personal Learning Environments: An Exploration of Interactivity in a South African Architectural Technology Context .......................................................................................... 1465
Patricia Harpur & Johannes Cronjé, Cape Peninsula University of Technology, South Africa; Franci Cronjé, Vega School of Brand Leadership, South Africa

Collaborative Design of Case Studies Applying an Adaptive Digital Learning tool .................................................................................................................................................. 1473
Pedro Isaias & Solange Lima, The University of Queensland, Australia

Innovative pedagogies and personalisation in STEM education with NEWTON Atomic Structure Virtual Lab ........................................................................................................................................ 1483
Tiina Lynch & Ioana Ghergulescu, Adaptemy, Ireland

A Trial Study on Connected Learning Media for Correspondence High School Students ............................................................................................................................ 1492
Yusuke Morita, Keiko Iizuka & Toru Nagahama, Waseda University, Japan

Water Cycle in Nature: Small-Scale STEM Education Pilot ................................................. 1496
Diana Bogusevschi, Dublin City University, Ireland; Irina Tal, National College of Ireland, Ireland; Marilena Bratu, University of Bucharest, Romania; Bogdan Gornea & Dorothea Caraman, Siveco, Romania; Ioana Ghergulescu, Adaptemy, Ireland; Cristina Hava Muntean, National College of Ireland, Ireland; Gabriel-Miro Muntean, Dublin City University, Ireland

Do Anonymity and Choice of Role help to Motivate and Engage Higher Education Students in Multiplayer Online Role Play Simulation Games? .................................................. 1506
Roni Linser, Open University of Israel, Israel; Gila Kurtz, Holon Institute of Technology, Israel
Enabling Teachers to Create Authentic Interview Simulations ................................. 1514
Iza Marfisi, LIUM, France; Isabelle Vinatier, CREN, France; Elisabetta Bevacqua, Lab-STICC, France; Mamadou Kébé, LIUM, France

How to Train Faculty When There Isn’t Time .............................................................. 1520
Claire Stuve & Shagufta Sami, The University of Toledo, United States

Contract Fire Brigade Firefighters’ Perspectives on Transfer of Simulation-based
Training ........................................................................................................................... 1523
Ida-Kaisa Teppo, Hanna-Leena Hyvönen & Hanna Vuojärvi, University of Lapland, Finland

AR and VR Meet Boiler Suits: Deriving Design Elements for AR / VR Trainings in the
HVAC Industry ........................................................................................................... 1533
Jennifer Beckmann, Katharina Menke & Peter Weber, Fachhochschule Süwwestfalen, Germany

Creating Virtual Reality Artefacts to Enhance and Transform Digital
Learning ....................................................................................................................... 1543
Mark Frydenberg, Bentley University, United States; Diana Andone, University, Romania

Identifying Student Profiles to Investigate Behavior during an Avatar-Based Learning
Task in a Virtual Environment ....................................................................................... 1553
Heather May Gautreau & Patricia Boechler, University of Alberta, Canada

Development of Interactive Virtual Learning Environment to Cultivate Spatial
Thinking ......................................................................................................................... 1562
Yukako Miyanishi, Graduate School of Human Sciences, Waseda University, Japan; Toru Nagahama, Faculty of Human
Sciences, Waseda University, Japan; Yusuke Morita, Faculty of Human Sciences, Japan

Perception in VR 3D vs VR 360 video: How a key cognitive process in learning
operates in virtual environments .................................................................................. 1565
Anne-Dominique Salamin, University of Applied Sciences western Switzerland, Switzerland (HES-SO), Switzerland

A Pilot Study on the Effects of a VR based Learning Equipment about Diurnal Motion
using 3D Gesture Manipulation ..................................................................................... 1572
Norio Setozaki, Nagasaki University, Japan; Keisuke Tajiri, Toru Nagahama & Yusuke Morita, Waseda University, Japan

Encouraging Collaborative Learning in Classrooms Using Virtual Reality
Techniques ....................................................................................................................... 1577
Takashi Shibata, Tokyo University of Social Welfare, Japan; Erika Drago, Musashino University Chiyoda High School,
Japan; Takayuki Araki, Musashino University, Japan; Tatsuya Horita, Tohoku University, Japan
Enhancing student, customer and staff experience with virtual and mixed reality

Ann Stevens, TAFE Queensland in partnership with the University of Canberra, Australia; Gabriel Deragopian, Orora Limited, Australia

‘Don’t Think, Feel!’: Zoo Learning Support Based on Real Body Interaction with Virtual Environment

Mikihiro Tokuoka, Naoki Komiya & Hiroshi Mizoguchi, Department of Mechanical Engineering, Tokyo University of Science, Japan; Ryohei Egusa, Meiji Gakuin University, Japan; Shigenori Inagaki, Graduate School of Human Development and Environment, Kobe University, Japan; Fusako Kusunoki, Department of Computing, Tama Art University, Japan

Inter-cognitive communication for immersive virtual education: four robot solutions.

Michael Vallance, Future University Hakodate, Department of Media Architecture, Japan; Takurou Magaki & Tomohiro Sasaki, Future University Hakodate, Intelligent Systems, Japan

A Virtual Reality Teaching and Learning Environment for Chemistry

Thomas Wilcox, wilcoxmedia.com, United States; Diane Wilcox, James Madison University, United States

Evaluative Research on Virtual and Augmented Reality for Children

Seonghye Yoon, LET’s Lab, Korea (South); JeeEun Jang, Envisible, inc., Korea (South); JiYoung Lim, Ewha Womans University, Korea (South)

HOUR(s and Hours) OF (Math +) CODE

George Gadanidis & Rosa Cendros Araujo, Western University, Canada

Why Do University Educators Use OER? A Cross-Cultural Study

Insung Jung, International Christian University, Japan; Ilju Rha & Jihyun Lee, Seoul National University, Korea (South)

The Validation of the MOOC Learner Engagement and Motivation Scale

Min Lan & Khe Foon Hew, The University of Hong Kong, Hong Kong

The User Experiences of MOOCs Website among College Students with Different Cognitive Styles

Sz-Yu Lin & Chun-Yi Shen, Tamkang University, Taiwan

Sustainability of Massive Open Online Courses (MOOCs): Beyond Business Models

Brenda Cecilia Padilla Rodríguez, Universidad Autónoma de Nuevo León, Mexico; Alejandro Armellini, University of Northampton, United Kingdom; Susana Leticia de la Garza Escamilla, Universidad Autónoma de Nuevo León, Mexico
An Evaluation of MOOC Success: Net Promoter Scores ................................................................. 1648  
Kristin Palmer, University of Virginia, United States; Christopher Devers, Johns Hopkins University, United States

Open Education Resources: Educators, Students, Perceptions and Change ................................................................. 1654  
Christine Sabieh, Notre Dame University, Lebanon

Developing a MOOC on Introductory Programming as Additional Preparation Course for CS Freshmen ................................................................. 1663  
Elisabeth Wetzinger, Bernhard Standl & Gerald Futschek, TU Wien, Austria

A Systematic Review of MOOC Research Methods and Topics: Comparing 2014-2016 and 2016-2017 ................................................................. 1673  
Meina Zhu, Annisa Sari & Curtis Bonk, Indiana University, United States

Designing for Openness: Multiple Audiences, Formats and Delivery Channels - Local Government in North Carolina E-Book, Podcast and AR Channel ................................................................. 1683  
Stefanie Panke, University of North Carolina at Chapel Hill, United States; Rick Morse, School of Government, UNC Chapel Hill, United States

Exploring Virtual Communities of Practice in Healthcare Education ................................................................. 1686  
Robin Kay, UOIT, Canada; Jordon Holmes, The Michener Institute of Education at UHN, Canada

Increasing digital literacy skills of older adults through a digital storytelling project-based course ................................................................. 1692  
Simone Hausknecht & David Kaufman, Simon Fraser University, Canada

E-Learning Modules for Sustainable Management – Requirements and Design Principles ................................................................. 1700  
Jan Moritz Anke & Matthias Schumann, University of Goettingen, Germany

The Experience of Digital Citizenship in a Secondary School Curriculum ................................................................. 1710  
Talitha Kingsmill, Education Consultant, Australia

Social innovations within makerspace settings for early entrepreneurial education - The DOIT project ................................................................. 1716  
Sandra Schön, Salzburg Research Forschungsgesellschaft mbH (Salzburg, Austria), Austria; Christian Voigt, Centre for Social Innovations (Vienna, Austria), Austria; Radovana Jagrikova, YouthProAktiv, Belgium
Computer games as inspiration for the development of a virtual learning platforms

Camilla Gyldendahl Jensen, University College of Northern Denmark and Aalborg University, Denmark; Elsebeth Korsgaard Sorensen, Aalborg University, Denmark

Learner Attributes and Technology-Enriched Environments Associated with Positive Climate Change Attitudes and Energy and Environmental Science Knowledge in Middle School Students

Gerald August Knezek, University of North Texas, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, United States

Environmental Agency through Social Media: A Mixed Methods Collective Case Study of Families Looking to Adopt Ecologically Responsible Actions as Part of a Private Facebook Group

Michel T. Leger & Shawn Martin, Université de Moncton, Canada

Motivating students and teachers in Sustainability through a Design Village

Pushpa Ramakrishna, National Science Foundation, United States; Ashish Amresh, Embry Riddle Aeronautical University Prescott, United States; Mary Cavanagh & Carole Greenes, Arizona State University, United States

Exploring Digital Citizenship in the Social Media Landscape through the Lens of a Blogging Community

John Stephens, School of Government, UNC Chapel Hill, United States; Stefanie Panke, University of North Carolina at Chapel Hill, United States

Teaching Children of Preschool Age about Internet and Digital Social Control. An Innovative Educational Intervention based on Greek Mythology, Theater and ICT

Maria Tzima, Department of Early Childhood Education, University of Ioannina, Greece; Katerina Karamitrou, Department of Early Childhood Education, University of Ioannina, Greece; Athanasios Bassounas, Regional Directorate of P&S Education of Epirus, Ioannina, Greece; Konstantinos Gerodimos, Department of Early Childhood Education, University of Ioannina, Greece

The Analysis of Factors Influencing Attitudes of Pre-Service Teachers toward Robots

Eunkyoung Lee, KICE, Korea (South); Seong-Won Kim & Youngjun Lee, Korea National University of Education, Korea (South)

Leveraging Open Educational Resources (OER), Social Media, and Mobile Learning in Africa: A Study of Six Classes with 450 Learners

Kristin Palmer, University of Virginia, United States
Dropout in Distance Education and how to Prevent it ................................................ 1788
Cathrin Vogel, Jana Hochberg, Sarah Hackstein, Alina Bockshecker, Theo J. Bastiaens & Ulrike Baumöl, FernUniversität in Hagen, Germany

A Quasi Experimental Study The Influence of School Information Construction Strategy Based on Local Characteristics on Students' Information Literacy in Weak Areas ................................................................. 1800
Luo Anni, Department of Education Information Technology, East China Normal University, China; Qian Dongming, Shanghai Engineering Research Center of Digital Educational Equipment, East China Normal University, China

Technology Integration Professional Development for Rural Educators .............. 1808
Melinda Davis & Cassidy Hall, University of Idaho, United States

Micro-credentials and work skills development for adult victims of domestic abuse: An illustrative case study. ................................................................. 1818
Terry McGovern, University of South Florida, United States

ICT as a pedagogical tool in secondary schools teaching and learning: policy and practices interplays ................................................................. 1827
Haruni Machumu, Vrije Universiteit Brussel, Belgium; Anathe Rabiel, Institute of Adult Education, Tanzania; Mustapha Almasi, Vrije Universiteit Brussel, Belgium

Blended Learning in Adult Education - Adult Learners Online (ALO) project. The quality and design of online and blended learning: research results and instruments in an online competence centre. ................................................................. 1833
Bram Bruggeman, Toll-net POV, Belgium; Bram Pynoo, VUB, Belgium

Exploring motivation and design effectiveness of individualized English as a Foreign Language blended training programs in a French organization. ............................. 1836
Rachel Chauvin & Fabien Fenouillet, University of Paris-Nanterre, France

The Blended-Appended: Online Learning Pedagogy as an Afterthought - Instructor Challenges and Contradictions ................................................................. 1842
Elaine Correa, California State University, Bakersfield, United States; Matthias Sturm, Simon Fraser University, Canada

Content Analyses of Asynchronous Discussions in Online and Blended Course Sections: Completing Phase 2 of Our Study ................................................................. 1846
Gayle V. Davidson-Shivers, Angela Doucet Rand & Suriya "Em" Thongsawat, University of South Alabama, United States
Transforming a traditional class into an innovative gamified class: Lessons learned from a teacher’s perspective

Biyun Huang, Peter Warning & Khe Foon Hew, Information and Technology Studies Division, Faculty of Education, The University of Hong Kong, Hong Kong

Flipping the Classroom Effectively: Evaluation Results from a Course at The University of Queensland

Pedro Isaias, Institute for Teaching and Learning Innovation (ITaLI), The University of Queensland, Australia; Blake McKimmie, School of Psychology, Faculty of Health and Behavioural Sciences, The University of Queensland, Australia; Aneesha Bakharia & John Zornig, UQx, Institute for Teaching and Learning Innovation (ITaLI), The University of Queensland, Australia

The Case-Study of “Young Programmers Travel with Odysseus”

Vasiliki Karampa & Foteini Paraskeva, University of Piraeus, Greece

The Effect of Anonymity on Online Peer Assessment: Quality of Feedback and Students' Attitudes

Michiko Kobayashi, Southern Utah University, United States

Applying First Principles of Instruction to Flipped Classroom in Engineering Education: Model and Instructional Strategies

JiYoung Lim & Seyoung Kim, Ewha Womans University, Korea (South)

Teachers' Motivational Factors and Engaging Constructivist Teaching Activities in Constructivist-based Blended Learning Environments in Tanzanian Universities

Haruni Machumu, Vrije Universiteit Brussel, Belgium; Chang Zhu, Vrije Universiteit Brussel, Belgium

Teaching and Learning Leadership Skills Online: Experiences of Developing Leadership Skills in a Blended Learning Educational Leadership Programme

Päivi Mayor & Virpi Heinonen, Tampere University of Applied Sciences, Finland; Irena Teneva, London, United Kingdom; Minna Hämäläinen, Tampere, Finland; Silja Kostia, Lahti University of Applied Sciences, Finland

Explore the effectiveness of using flipped classroom for university students to learn photo editing techniques

Eugenia M. W. Ng, Lingnan University, China

Virtual Learning Environment (VLE): Its Impact on Primary School Children’s Learning

Noor Omar & Ruth Geer, University of South Australia, Australia
Evaluation of student engagement with differential media for Flipped Classroom teaching .................................................................................................................................................................................. 1923
Zoe Prytherch & Stephen Rutherford, Cardiff University, United Kingdom

"It's like sharpening a knife": Instructors' Time in Blended Learning Courses ........................................................................................................................................................................... 1929
Luis Francisco Vargas-Madriz & Norma Nocente, University of Alberta, Canada

Gender and persistent grade performance differences between online and face to face undergraduate classes ........................................................................................................................................................................................................ 1935
Adonis R Amparo, University of South Florida/ Hillsborough Community College, United States; Glenn Smith & Alon Friedman, University of South Florida, United States

When Great Teaching Is Not Enough: Utilizing Student Perception to Increase Retention in Online Learning .................................................................................................................................................................................................................. 1940
Michelle Beach, Southwest Minnesota State University, United States

Micro-Lab: video simulations in online professional development Micro Credential model ........................................................................................................................................................................................................................................ 1945
Shir Boim Shwartz, CET- center for educational technology, Israel

Effects of questioning advance organizers on learning outcomes in a web-based learning object on research and academic skills ........................................................................................................................................................................................................................................... 1951
Christine Brunn, Fachhochschule Lübeck, Germany; Joshua Weidlich & Theo Bastiaens, FernUniversität in Hagen, Germany

Flipping the classroom in a teaching methodology course for pre-service primary mathematics teachers ........................................................................................................................................................................................................................................ 1961
Yip Cheung Chan, The Chinese University of Hong Kong, Hong Kong

Authentic Assessments: A Critical thinking and Engagement Tool for Online Courses ........................................................................................................................................................................................................................................... 1967
Lilia Juele, Rockland Community College (SUNY), United States

Technology Tools in Distance Education: A Review of Faculty Adoption ........................................................................................................................................................................................................................................ 1982
Rui Li, West Chester University, United States; JT Singh, West Chester University of Pennsylvania, United States; Jennifer Bunk, The People Stack Company, United States

A Trial Study on Relationship between Learner’s Pupillary Changes and Interests in an Iterated High Speed Educational Video ........................................................................................................................................................................................................................................ 1988
Toru Nagahama, Yukako Miyanishi, Shuntaro Mitomo & Yusuke Morita, Waseda University, Japan
Achievement and attitudes in technology-supported postsecondary education: Complexity of relationships through the lens of meta-analysis

Eugene Borokhovski & Robert M. Bernard, Centre for the Study of Learning and Performance (CSLP), Concordia University, Canada; Rana M. Tamim, College of Education, Zayed University, United Arab Emirates; Richard F. Schmid, Department of Education, Concordia University, Canada

Benefits, Challenges and Design Guidelines for Synchronous Hybrid Learning: A Systematic Literature Review

Loulou Detienne, KU Leuven, campus KULAK, Belgium; Annelies Raes, KU Leuven, campus KULAK + ITEC, KU Leuven also at imec Kapeldreef 75, B-3001 Leuven, Belgium; Fien Depaepe, KU Leuven, campus KULAK +ITEC, KU Leuven also at imec Kapeldreef 75, B-3001 Leuven, Belgium

Probing, Sensing, Responding - How to implement digital learning innovations by using the Cynefin framework

Annabell Bils, FernUniversität in Hagen, Germany

Blended learning in Adult Education - Is it the learner, the teacher or quality & design? Findings of the Adult Learners Online (ALO!) project in Flanders – Part 1

Bram Pynoo, Koen DePryck & Chang Zhu, Vrije Universiteit Brussel, Belgium; Ellen Van Twembeke, KU Leuven, Belgium; Silke Vanslambrouck & Yves Blieck, Vrije Universiteit Brussel, Belgium; Hilde Van Laer, CVO Antwerpen / Vrije Universiteit Brussel, Belgium; Brent Philipsen & Jo Tondeur, Vrije Universiteit Brussel, Belgium

Unexpected Insights: A Collaborative Autoethnography of the Experiences of International Students on an Authentic E-Learning Distance Educational Leadership Program

Mark Rasi, Queensland University of Technology, Australia; Anita Jantunen, Mark Curcher & Hanna Teras, Tampere University of Applied Sciences, Finland

Exploring Video Literacy and the Practice of Educators: Videos, Vlogs, Videoconferencing and Holographic Teleportation

Julie-Ann Sime, Lancaster University, UK, United Kingdom; Chryssa Themelis, Lancaster University, United Kingdom

The Use of Adobe Connect and Studium Platforms in Post-Graduate Academic Education. A case study.

Marjolaine St-Pierre, University of Montreal, Canada

From Refugee to Programmer? An Action-Based Learning Approach for Teaching Coding to Refugees

Daniela Wolf, Ferdinand Porsche FernFH, Austria; Martin Ebner, Technische Universität Graz, Austria
Investigating Elementary School Teachers’ Attitudes Toward and Use of STEM-Based Apps .................................................................................................................................................................................. 2057
Robin Kay, UOIT, Canada; Sharon Lauricella, University of Ontario Institute of Technology, Canada

The use of facial expressions as a nonverbal communication element in the 21st century online learning video environments ............................................................................................................................................................................................... 2062
Irem Aydin Menderis & Mehmet Kesim, Anadolu University, Turkey

Valerie Barbaro, University of Minnesota, United States

Towards a Psychological Model for Learning in Avatar-based Virtual Environments: How Important is Spatial Processing? .................................................................................................................................................................................. 2075
Patricia Boechler, Heather Gautreau, Erik deJong & Peter Sterling, University of Alberta, Canada

Online Group Work: Yeah or Nay? Student-Generated Suggestions for Online Collaboration .................................................................................................................................................................................. 2084
Adriana D’ Alba, University of West Georgia, United States

Online Learning in Higher Education: Comparing Teacher and Learner Perspectives .................................................................................................................................................................................. 2089
Peter Kilgour & Maria Northcote, Avondale College of Higher Education, Australia

Exploring the factors affecting learning satisfaction in the K-MOOC learning environment .................................................................................................................................................................................. 2100
Eugene Lim & Suyoun Kim, Seoul National University of Science & Technology, Korea (South)

Multi-Lingual Pseudo Natural Language Programming Environment for Beginners .................................................................................................................................................................................. 2106
Toshiyuki Maeda & Yae Fukushige, Hannan University, Japan; Masumi Yajima, Meikai University, Japan; Akiyoshi Wakatani, Konan University, Japan

Student perception of the quality of discussion in a synchronous virtual classroom environment .................................................................................................................................................................................. 2111
Kate Reynolds, The University of New Orleans Department of Curriculum, Instruction, and Special Education, United States; Linda Flynn-Wilson, The University of New Orleans, United States

Flow-experience and acceptance in scenario-based e-learning settings in higher education - an empirical comparison of goal-based and game-based learning environments. .................................................................................................................................................................................. 2117
Silke Schworm & Lisa Holzer, University of Regensburg, Germany
Co-Teaching Graduate, Online Teacher Education Courses: A Preliminary Look at the Advantages and Disadvantages 2127
Janet Strickland & Jill Drake, University of West Georgia, United States

Perceptions of Cheating on Online versus Face-to-Face Mathematics Exams 2132
Carla van de Sande, Arizona State University, United States

Exploring social immediacy/intimacy in fully online learning communities through synchronous tools. 2138
Roland vanOostveen, University of Ontario Institute of Technology, Canada; Elizabeth Childs, Royal Roads University, Canada; Julianne Gerbrandt & Kamal Awwadah, University of Ontario Institute of Technology, Canada

What Social Presence is, what it isn’t, and how to measure it: A work in progress 2142
Joshua Weidlich, FernUniversität in Hagen, Germany; Karel Kreijns & Kamakshi Rajagopal, Open University, Heerlen, Netherlands; Theo Bastiaens, FernUniversität in Hagen, Germany

Best of The Netherlands: How children use computational thinking skills when they solve a problem using the Ozobot 2151
Diane van der Linde & Nicole van der Aar, Windesheim University of Applied Sciences, Netherlands; Joke Voogt, University of Amsterdam/ Windesheim University of Applied Sciences, Netherlands

Towards an Online Institutional Tutor Programme at a Higher Institution of Learning 2163
Juliet Stoltenkamp, Martha Sibanda & Nyameko Yabo, University of the Western Cape, South Africa

Authentic online assessment in assessing basic accounting content knowledge of Grade 10 learners 2177
Rabaitse Diseko & Wendy Modiba, University of Johannesburg, South Africa

The Contribution of Information and Communication Technologies and Andragogy to Adult Education in Brazil - The EJA Case 2187
Janice Chemale-Barth, Federal University of Rio Grande do Sul, Brazil

Assessing Alignment between High School IT Courses and State IT Curriculum Frameworks 2193
Marcia Mardis & Faye Jones, Florida State University, United States

Student engagement through social construction of meaning 2199
Ellen Taricani, Penn State University, United States
No prior experience necessary: Reflecting on the learning experiences offered by student-created online discussions ................................................................. 2205
Ana-Paula Correia, Cara A. North, Ceren Korkmaz & Vicki E. Simmerman, The Ohio State University; College of Education and Human Ecology, United States; Karen A. Bruce Wallace, Ohio State University; College of Education and Human Ecology, United States

Best of Germany: Beyond the Buzzwords: A Strategy to Connect Curricula with the Digital World ........................................................................................................ 2219
Thilo Harth & Frank Dellmann, Muenster University of Applied Sciences, Germany, Germany

Best of Ireland: The Learning Portfolio in Higher Education: An Integrative Review ..................................................................................................................... 2237
Darina Scully, Michael O’Leary & Mark Brown, Dublin City University, Ireland

Promoting Satisfaction in Online Courses ................................................................. 2263
Miki Kritz, Kibbutzim College of Education, Israel; Miri Shonfeld, Kibbutzim College and MOFET, Israel

Mobile Web Technologies in Sports: Design, Development and Evaluation of a Training Assistant ........................................................................................................ 2279
Dominic Ellek, SRH Fernhochschule - The Mobile University, Germany; Wolfgang Mueller, Sandra Rebholz & Stefan Koenig, PH Weingarten, Germany

Best of Finland: Developing Students` Multidisciplinary Competencies: ATS2020 Teaching and Learning Model Implementation in Finland .................................. 2297
Antti Syvänen, Anne Rongas, Jaako Vuorio & Jarmo Viteli, University of Tampere, Finland

Best of Finland: Adult Playfulness in Simulation-based Healthcare Education .............................................................................................................................. 2316
Tuulikki Keskitalo, Marjaana Kangas & Heli Ruokamo, University of Lapland, Finland

Mobile Learning: An Experience for Global Education .............................................. 2334
Elias Goulart, Municipal University of Sao Caetano do Sul - USCS, Brazil.; Brazil; Päivi Aarreniene-Jokipelto, Haaga-Helia University of Applied Sciences, Finland; Mirva Hyypää, Lappeenranta University of Technology, Finland; Sandhira Cabral & Catia Milreu, Municipal University of Sao Caetano do Sul - USCS, Brazil.; Brazil

The Use of Open Education Resources in Open Distance Learning for Teacher Professional Development in Gabon ................................................................. 2358
Verona Leendertz, Jean Louis Ndoutoume Mendene & Seugnet Blignaut, North-West University, South Africa

Integrating Computational Thinking in Mathematics and Science Teacher Education ............................................................................................................... 2379
Rosa Cendros Araujo, Lisa Floyd & George Gadanidis, Western University, Canada
Rapid Prototyping for Learning: Making Revisions to Designs through 3D Printing ................................................................. 2391
Marlo Steed, Faculty of Education, University of Lethbridge, Canada

MediaThing - A Learning Scenario Targeting on Research Skills ................................................................. 2397
Felix Winkelnkemper & Reinhard Keil, Paderborn University, Germany

Identifying Strategies for Teaching Computational Thinking by Problem Solving and Self-Awareness .................................................. 2413
Li Xu, University of Arizona South, United States

Application Development for Education Comparing the Image Pictures and Data by Superimposing ................................................................. 2422
Hitoshi Nakagawa, The Open University of Japan, Japan; Masuo Murai, Kanazawa Seiryo University, Japan; Yukie Sato, Kanazawa Seiryo University, Japan, Japan; Yuki Kobayashi, Ibaraki University, Japan; Aritomo Iwasaki, Iwami J-School, Japan; Naruyoshi Tabe & Taiga Maruyama, Sky Co., Ltd, Japan