<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Steps: Scaffolding Teachers' Uses of Innovative Learning Pedagogies</td>
<td>1</td>
</tr>
<tr>
<td>Peggy Ertmer, Purdue University, United States</td>
<td></td>
</tr>
<tr>
<td>Amanda Thomas, University of Nebraska-Lincoln, United States; AJ Edson, Michigan State University, United States</td>
<td></td>
</tr>
<tr>
<td>Supporting Debugging Skills: Using Embodied Instructions in Children’s Programming Education</td>
<td>19</td>
</tr>
<tr>
<td>Jung-Hyun Ahn, Yaoli Mao, Woonhee Sung &amp; John B. Black, Teachers College, Columbia University, United States</td>
<td></td>
</tr>
<tr>
<td>Creating an Engaging App Development Course for Girls: Catalyzing Young Women’s Interest and Abilities in STEM</td>
<td>27</td>
</tr>
<tr>
<td>Savilla Banister &amp; Cindy Ross, Bowling Green State University, United States</td>
<td></td>
</tr>
<tr>
<td>Using Drones to Ensure Student Success</td>
<td>36</td>
</tr>
<tr>
<td>Christopher Carnahan, Doctoral Program Coordinator, New Jersey City University, United States; Kimberly Crowley, New Jersey City University, United States</td>
<td></td>
</tr>
<tr>
<td>Community-Based Learning to Foster Computational Thinking</td>
<td>40</td>
</tr>
<tr>
<td>Betul Czerkawski, University of Arizona, United States</td>
<td></td>
</tr>
<tr>
<td>Roles of Teacher Education in Math Snacks Game Development</td>
<td>46</td>
</tr>
<tr>
<td>Cynthia Gomez, New Mexico State University, United States; Karin Wiburg, NMSU, United States</td>
<td></td>
</tr>
<tr>
<td>Computational Thinking in Computer Science Classrooms: Viewpoints from CS Educators</td>
<td>51</td>
</tr>
<tr>
<td>Jon Good &amp; Aman Yadav, Michigan State University, United States; Punya Mishra, Arizona State University, United States</td>
<td></td>
</tr>
<tr>
<td>Running a High School Programming Contest: a Distributed Approach</td>
<td>60</td>
</tr>
<tr>
<td>Michael Jonas, University of New Hampshire at Manchester, United States; Mihaela Malita, Saint Anselm College, United States</td>
<td></td>
</tr>
<tr>
<td>Teacher knowledge for early mathematics education in a technology-rich environment - in the eyes of practitioners</td>
<td>68</td>
</tr>
<tr>
<td>Kam Ling Lao, Open University of Hong Kong, Hong Kong</td>
<td></td>
</tr>
<tr>
<td>Applications of Computational Matrix Algebra</td>
<td>72</td>
</tr>
<tr>
<td>Gerard Rambally, University of North Texas at Dallas, United States</td>
<td></td>
</tr>
</tbody>
</table>
Designing Learning Trajectories for Computational Thinking ................................. 80
Allard Strijker & Petra Fisser, National Institute For Curriculum Development Netherlands, Netherlands

Exploring college students’ program comprehension skills from visual to procedural programming ................................................................. 83
Fatimah Tijani, Ronel Callaghan & Rian deVilliers, University of Pretoria, South Africa

A Systematic Review of Factors Influencing Technology Use by Pre-service and Novice Teachers .................................................................................................................................. 89
Manjari Banerjee, Zhihong Xu, Luchen Jiang & Hersh Waxman, Texas A&M University, United States

The 3D Printer as Assistive Technology ............................................................................................................................... 95
Terence Cavanaugh & Nicholas Eastham, University of North Florida, United States

Effect of Makerspace Professional Development Activities on Elementary and Middle School Educator Perceptions of Integrating Technologies with STEM ................................................................. 103
Jennifer Miller, University of North Texas/Birdville ISD, United States; Troy Cline, NASA, United States

Digital Fabrication in Education: A Critical Look at Authentic Integration ........................... 112
Shaunna Smith, Texas State University, United States; Jonathan Cohen, Georgia State University, United States; Monty Jones, Virginia Commonwealth University, United States

3D digital design and elementary students’ spatial visualization skills .............................. 114
Jason Trumble, University of Central Arkansas College of Education, United States

What We have Learned About the Impact of Dyads on Students’ Self-Regulation Skills ................................................................. 118
Rasis Alanazi, University of Connecticut, United States

Designing an Effective Massive Open Online Course for Educators: Evidence from Student Experience ................................................................. 122
Savilla Banister & Rachel Reinhart, Bowling Green State University, United States

Digital Pedagogy: Embedding Universal Design for Learning (UDL) Strategies in Online Courses ................................. 127
Debra Bauder & Thomas Simmons, University of Louisville, United States

The Impact Teaching Online has on Technology Adoption for Face-to-Face Instruction ................................. 133
Kyle Boudreaux, Lamar University, United States
Ten Essential Online Tools and Resources for Introducing Blended Learning in Higher Education Courses ................................................................. 136
David Byrum, Texas State University, United States; Douglas Holschuh, Texas State University, United States

A MOOC for U: The design of a MOOC based on Universal Design for Learning ................................................................. 143
Ritushree Chatterjee, Darshana Juvale & Nadia Jaramillo, Iowa State University, United States

Key Processes for Developing and Maintaining Quality Online Discussion Forums ................................................................. 149
Paula Christensen, Northwestern State University of Louisiana, United States

Modeling Universal Design for Learning in Online Instruction An Open and Interactive Course Model: SOOC ......................................................... 153
Elizabeth Dalton, University of Rhode Island, Dalton Education Services International, United States; Kendra Grant, Kendra Grant Consulting, United States; Luis Perez, Inclusive Learning Consultant, United States

Greater Social to Cognitive Presence through Webconferencing ................................................. 159
Susan Elwood & Jeremiah Brauhn, Texas A&M University Corpus Christi, United States

Learning Analytics and Visualization of Japanese EFL Learners’ Learning Behavior in Speaking Practice ................................................................. 166
Suro Fu, University of Tsukuba, Japan; Yuichi Ono, Center for Education of Global Communication (CEGLOC), University of Tsukuba, Japan

From Face-to-Face to Cyberspace: How does student performance change in Communication courses? ................................................................. 173
Lacey Fulton, Clarion University of Pennsylvania, United States; Mark Piwinsky & Mary Beth Leidman, Indiana University of Pennsylvania, United States

It’s Blog! It may be old news to some, but it may be perceived as a welcome alternative to the discussion board in online digital media courses. ................................................. 179
Lacey Fulton, Clarion University of Pennsylvania, United States; Mary Beth Leidman, Indiana University of Pennsylvania, United States; Christopher Carnahan, New Jersey City University, United States

Cognitize your course: Technology tools to optimize cognition in online learning ................................................................. 184
Michele Garabedian Stork, Florida Gulf Coast University, United States
Effective Approaches to Online Teaching and Learning: Research-Based Demonstrations and Reflections: Part 1 ................................................................. 189
    Kevin J. Graziano, Nevada State College, United States; Elizabeth Dalton, Dalton Education Services International (DESI), United States; Michael Kosloski, Old Dominion University, United States; Chery Takkunen-Lucarelli, The College of St. Scholastica, United States

Flipping Math in a Secondary Classroom ................................................................. 192
    Kevin J. Graziano, School of Education, Nevada State College, United States; John D. Hall, Global High School, United States

Students’ Response to Lecture Presentation Designs in Online Learning Environments ................................................................................................. 201
    Robin Henrikson & Cari Crane, Seattle Pacific University, United States

Building Community in Online Programs for Learners from High and Low Context Cultures .................................................................................. 210
    Malia Hoffmann, Loretta Donovan, Tim Green & Nawang Phuntsog, California State University, Fullerton, United States

Students' Voices: Freshmen’s Perceptions and Recommendations on the Design of the Online Portion of a Flipped Classroom Course with a Large Enrollment Number ........................................................................................................... 216
    Nadia Jaramillo Cherrez & Yi Jin, Iowa State University, United States

FunGram: A Tool to Facilitate Problem Solving Among First Year Programming Students ................................................................................................. 222
    Katrieva Jones Munroe, Alamo Colleges District, United States

The “Teacher Exception” to the United States Copyright Law: Does it Still Exist? ........................................................................................................... 228
    Tracey Makley, Florida State College at Jacksonville and University of North Florida, United States

The Embedded Librarian: Going Beyond the Field of Dreams Model for Online Programs ........................................................................................................... 235
    David Marcovitz & Robert Kenyon, Loyola University Maryland, United States; Catherine Staley, Loyola-Notre Dame Library, United States

The effect of choice of instruction in personalized flipped learning ................................. 240
    Hisae Matsui, Princeton University, United States; Terence Ahern, West Virginia University, United States

Changing Teachers Minds: An Ohio Experiment. .......................................................... 247
    Mark Miller, State Support Team Region 12, United States
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of E-learning of Distance Graduate Students of Sukhothai Thammathirat Open University</td>
<td>252</td>
</tr>
<tr>
<td>Phisit Nadprasert &amp; Walaiwad Chaiyabutr, Sukhothai Thammathirat Open University, Thailand</td>
<td></td>
</tr>
<tr>
<td>Motivational Effects of a Game-Based Automatic Quiz Generator Using Online Educational Resources for Japanese EFL Learners</td>
<td>258</td>
</tr>
<tr>
<td>Yuichi Ono, Center for Education of Global Communication (CEGLOC), University of Tsukuba, Japan; Ai Nakajima, University of Tsukuba, Japan; Manabu Ishihara, Oyama National College of Technology, Japan</td>
<td></td>
</tr>
<tr>
<td>Massive open online course (MOOC) for differentiated instruction of Turkish as a foreign language</td>
<td>266</td>
</tr>
<tr>
<td>Yasin Ozarslan &amp; Ozlem Ozan, Yasar University, Turkey</td>
<td></td>
</tr>
<tr>
<td>Perceived vs. Actual Online Teaching Needs of University Faculty: A Mixed-methods Study</td>
<td>273</td>
</tr>
<tr>
<td>Vicki Parish &amp; Haihong Hu, University of Central Arkansas, United States</td>
<td></td>
</tr>
<tr>
<td>Discussion of Controversial Issues in an Online Teacher Preparation Course</td>
<td>280</td>
</tr>
<tr>
<td>Jessamay Pesek, Bemidji State University, United States</td>
<td></td>
</tr>
<tr>
<td>A Tale of Two Twitters: Synchronous and Asynchronous Use of the Same Hashtag</td>
<td>283</td>
</tr>
<tr>
<td>Joshua Rosenberg, Michigan State University, United States; Mete Akcaoglu, Georgia Southern University, United States; K. Bret Staudt Willet, Michigan State University, United States; Spencer Greenhalgh, Michigan State University, United States; Matthew Koehler, Michigan State University, United States</td>
<td></td>
</tr>
<tr>
<td>The Interactive Online Course-Level Orientation Module: Fostering TPACK and an Introduction to Domain Knowledge</td>
<td>287</td>
</tr>
<tr>
<td>Peggy Semingson, University of Texas at Arlington, United States; Melanie Mason, The University of Texas at Arlington, United States; Jared Keengwe, University of North Dakota, United States</td>
<td></td>
</tr>
<tr>
<td>Building a Community of Learners: Case Study in a Hybrid Course</td>
<td>293</td>
</tr>
<tr>
<td>Zsuzsanna Szabo, Marist College, United States</td>
<td></td>
</tr>
<tr>
<td>Growth mindsets and flexible thinking in first-time online students’ self-efficacy in learning</td>
<td>299</td>
</tr>
<tr>
<td>Hungwei Tseng, Jacksonville State University, United States; Yu-Chun Kuo, Rowan University, United States</td>
<td></td>
</tr>
<tr>
<td>Using the Game-based Student Response Tool Kahoot! in an Online Class: Perspectives of Online Learners</td>
<td>303</td>
</tr>
<tr>
<td>Hasan Ucar, Bilecik Seyh Edebali University, Turkey; Alper Tolga Kumtepe, Anadolu University, Turkey</td>
<td></td>
</tr>
</tbody>
</table>
Developing an Online Professional Development Program to Prepare Faculty to Teach Online .......................................................... 308
Hong Wang, Northern Virginia Community College, United States

Exploring the Use of Assigned Roles in Online Class Discussions .................. 313
Amber Warren, University of Nevada, Reno, United States

Are College Faculty Willing – and Ready – to Have Their Courses “Open”? .......................... 319
Huei-Chuan Wei & Chien Chou, Institute of Education, National Chiao Tung University, Taiwan

Online Course Design: Incorporating Data Analytics for Improved Course Delivery .......................... 325
David White, Mark Dame & Parviz Safadel, Texas Tech University, United States

Improving Engagement: The use of Slack to improve engagement and learning outcomes for online students .............................................. 328
Romi Wittman, University of Arizona South, United States

Move In-Class Discussion Online to Engage Distance Learning Students ............. 332
Lin Zhong, Southern Illinois University Carbondale, United States

Using Digital Storytelling to enhance an existing teacher education curriculum: How digital tools can enhance content, engagement and outcomes without adding new courses in a mandated program. .................................................. 335
Claude B. Abbott, Central Connecticut State University IT-Instructional Design & Technology Resource Center, United States; Carol M. Ciotto, Central Connecticut State University School of Education and Professional Studies, United States; Karen J. Riem, Central Connecticut State University Special Education & Interventions, United States

Developing Storybooks without Words for Character Education: A Unique Use of Augmented Reality for Student Learning and Product Development .................. 340
Domenic Dini & Leping Liu, University of Nevada, Reno, United States

Research Results of Digital Storytelling Contest (DISTCO) 2016 .......................... 344
Bulent Dogan & Kadir Almus, North American University, United States

Constructing Knowledge via Digital Video – A Literature Review .......................... 356
Remberto Jimenez, New Jersey City University, United States

Curating Digital Objects and Telling Stories .................................................. 362
Jeonghyun Kim & Ana Roeschley, University of North Texas, United States
Effects of a Digital Storytelling Project on Japanese EFL Learners’ CALL Attitudes and Awareness of CALL Tasks
Ayaka Morino & Elvis Lopez, Master Course in Education, University of Tsukuba, Japan; Yuichi Ono, Center for Education of Global Communication (CEGLOC), University of Tsukuba, Japan

Digital Story Design: Producing Effective Videos by Comparing Visual Components
Victor Nevarez & Annie Hale, Arizona State University – Sustainability Science Education Project, United States; Leanna Archambault, Arizona State University, United States

3 Simple Tricks that Will Change the Way You Think about Listicles Forever
Liz Owens Boltz, Brian Arnold & Rohit Mehta, Michigan State University, United States

Starting the Conversation: A Working Definition of Critical Digital Pedagogy
Susan Bontly, Samar Khalil, Tahani Mansour & Julia Parra, NMSU College of Education, United States

An Exploratory Analysis of WCAG 2.0 Conformance in Higher Education Websites
Christopher D. Coleman, Louisiana Tech University, United States

Evaluating Instruction for Culturally Responsive Teaching Using a STEM Curriculum Review Rubric
Carol J. Delaney, Kathryn S. Lee & Beth Bos, Texas State University, United States

Effective Instructional Strategies Implemented by Preservice Teachers to Teach Culturally and Linguistically Diverse Students in Secondary Classrooms.
Faith Maina & Amani Zaeir, Texas Tech University, United States

The Semantic Analysis of Media Influence in Moodle-based Self-reflective Entries of Intercultural Encounters of Children and University Students
Kahoko Matsumoto, Tokai University, Japan, Japan

Digital Storytelling as a Reflective Tool for Preservice Teachers
Jayna McQueen, Texas Christian University, United States

Differentiated Instruction: How simSchool was used in a Two Graduate Courses
David Collum, Missouri Baptist University, United States; Larinee Dennis, Hannibal LaGrange University, United States; Melanie Bishop & Timothy Delicath, Missouri Baptist University, United States
Evaluating the Effectiveness of simSchool on Increasing Preservice Teachers' Understanding of the Educational Needs of Diverse Learners: A Study across Three Midwestern Universities

David Collum, Missouri Baptist University, United States; Larinee Dennis, Hannibal LaGrange University, United States; Allison Gohring, Lindenwood University, United States; Melanie Bishop & Timothy Delicath, Missouri Baptist University, United States

Let the Games Begin

Tammy Fry, Blue Valley Center for Advanced Professional Studies (CAPS), United States

Virtual Vistas: Creating and Implementing Virtual Field Trips

Jeffrey Hall, Lucy Bush & Colleen Stapleton, Mercer University, United States

Video Game Genres and Problem Solving Strategies

Karla Hamlen, Cleveland State University, United States

Friends with Different Abilities: An educational computer game

Carol Redfield, St. Mary’s University, United States; Crystal Redfield, John Jay Science and Engineering Academy, United States

A MMORPG with Language Learning Strategic Activities to Improve English Grammar, Listening, Reading, and Vocabulary

Sandra Rogers & Burke Johnson, University of South Alabama, United States; Rick Van Eck, University of North Dakota, United States; James Van Haneghan & Susan Martin, University of South Alabama, United States

Design of an Interactive Case-based Simulation for Learning Educational Psychology

Julia Roman, Elizabeth Mercer, Kerry Wilt, Victoria Denardis, Murshay Stover, D. Matthew Boyer & Meihua Qian, Clemson University, United States

Design and Assessment of a Location-based Game to Support English Vocabulary Learning in University

Feier Tang, Graduate School of Human-Environment Studies, Kyushu University, Japan; Boyu Wang, Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan; Kosuke Kaneko, Cyber Security Center, Kyushu University, Japan; Yoshiko Goda, Graduate School of Instructional Science, Kumamoto University, Japan; Yoshihiro Okada, Innovation Center for Educational Resource, Kyushu University, Japan; Masanori Yamada, Faculty of Arts and Science, Kyushu University, Japan
Exploring the Rules of the Game: Games in the Classroom, Game-Based Learning, Gamification, and Simulations ...................................................... 475
Jana Willis, University of Houston-Clear Lake, United States; Spencer Greenhalgh, Michigan State University, United States; Larysa Nadolny, Iowa State University, United States; Sa Liu, University of Texas, United States; Tugce Aldemir, Penn State World Campus, United States; Sandra Rogers, University of South Alabama, United States; Monica Trevathan, Tietronix Software, United States; Susan Hopper, Pedagogical Balance of Effective Learning, United States; Wendy Oliver, Thrivist, United States

Quality of Instructor Intention: Understanding Learner Needs through Timeliness of Engagement, Quality of Feedback and Embedded Motivational Understandings .................................................. 481
Caroline M. Crawford, University of Houston-Clear Lake, United States; Noran L. Moffett, Fayetteville State University, United States

Shifting Classroom Teacher Perceptions of Learning Technologies through a Community of Practice and Community-Embedded Approach ........................................... 487
Caroline M. Crawford, University of Houston-Clear Lake, United States

Practice What We Preach: A Revision of an Online Teaching Certification Program ............................................................................................................. 493
Felicia Cruz & Taylor Cody, St. Mary's University, United States

Toward Improved Professional Digital Competence: The Use of Blended Learning in Teacher Education in Norway ................................................................. 499
Greta Björk Gudmundsdottir, Institute for Teacher Education and School Research, University of Oslo, Norway, Norway; Kristin Beate Vaszò, Institute for Teacher Education and School Research, University of Oslo, Norway

Taking Blended Learning to Graduate Teacher Education: Examining a Blending Strategy .............................................................................................. 510
Dawn Hathaway & Priscilla Norton, George Mason University, United States

Comparisons of Online and Face-to-Face (F2F) Candidates’ Classroom Readiness ........................................................................................................... 518
Tina Heafner, University of North Carolina at Charlotte, United States; Teresa Petty, UNC Charlotte, United States

Dynamic Design, Development, and Delivery: Best Practices for Online Graduate Education Courses .................................................................................. 526
Jacqueline Kaminski Mumford & Michelle Lenarz, Walsh University, United States
Perceptions in Higher Education of Professional Learning Networks (PLNs) ................................................................................................................................. 532
Daniel G Krutka, Texas Woman's University, United States; Torrey Trust, University of Massachusetts Amherst, United States; Jeffrey Carpenter, Elon University, United States

Leveraging Graduate Work: Perspectives on Pursuing a Career in Academia ............................................................................................................................ 536
Elizabeth Langran, Marymount University, United States; Curby Alexander, Texas Christian University, United States; Jonathan Cohen, Georgia State University, United States

Understanding the antecedents of self-awareness critical thinking in management education ................................................................................................................................. 538
Shinyi Lin & Yi Ping Lin, National Taichung University of Education, Taiwan

Strategies for Engaging Online Learners: Lessons from Virtual Reference in Academic Libraries ............................................................................................................................. 546
Adolfo Prieto, California State University, Fullerton, United States

A Path to Successful Online Instruction .............................................................................................................................................. 549
Elaine Reeder, Virginia Commonwealth University, United States

The Contribution of the Social Network to the Teaching and Learning Process ............................................................................................................................... 554
Tami Seifert, Kibbutzim College of Education Technology and the Arts, Israel

Staying Current: A Digitally-Focused Professional Development Series and Partnership in a College of Education ................................................................................................................................. 560
Peggy Semingson, University of Texas at Arlington, United States; Kathryn Pole & Brian Brown, The University of Texas at Arlington, United States

Using Interactive Narratives to Better Prepare Pre-Service Teachers ......................... 566
Hyuksoon Song, Georgian Court University, United States

Value Co-creation Model for Higher Education Service ................................................. 572
Ryota Sugino, Yushun Idei, Koji Kimita & Yoshiki Shimomura, Tokyo Metropolitan University, Japan

A Framework for Problem-Based Learning in the Virtual Environment for Graduate Students Enrolled in Courses for Principal Certification ............................................. 578
Pam Winn & Melissa Becker, Tarleton State University, United States; Danna Beaty, Tarleton State University, United States
Interviews of Participants in a Short-Term Study Abroad Program in Costa Rica Regarding Educational Technology ................................................................. 586
Stephen Adams, Educational Technology and Media Leadership, California State University, Long Beach, United States; Fabian Rojas Ramirez, Educational Leadership, California State University, Long Beach, USA and Universidad Nacional, Costa Rica

Emerging Global Learning Environments: The Role of Communication and Collaboration in Higher Education Settings ................................................................. 597
Ahmed Alanazi & Ronald Aust, University of Kansas, United States; Allen Quesada, University of Costa Rica, San José, Costa Rica

Comparing what matters: Rethinking international indicators of information technology in education ............................................................................................................ 602
David Gibson & Jill Downie, Curtin University, Australia; Tania Broadley, Queensland University of Technology, Australia; Peter Wallet, UNESCO Regional Office for Eastern Africa, Antenna in Rwanda, Rwanda

Spencer P. Greenhalgh & Matthew J. Koehler, Michigan State University, United States

The Unique Challenges of Preparing Teachers in the Caribbean to Teach With Technology ............................................................................................................ 620
Paula MacKinnon, MindBloom Consulting, Canada; Gregory MacKinnon, Acadia University, Canada

Analysis of the Features of the Junior and Senior High School Students of Regulated Learning under Asynchronous e-Learning in Japan ................................................................. 624
Takayuki Araki, Musashino University, Japan; Ryo Saito & Tatsuya Horita, Graduate School of Information Sciences, Tohoku University, Japan

2016-17 Special Issues of AACE’s Journal of Online Learning Research .................. 632
Leanna Archambault, Arizona State University, United States; Jered Borup, George Mason University, United States; Saro Mohammed, The Learning Accelerator, United States; Rebecca Parks, Mansfield University, United States

SITE Joint SIG Symposia: A Collaboration Between the K-12 Online Learning SIG and Distance Learning SIG: How Higher Education and K-12 Online Learning Research Can Impact Each Other ............................................................................................................ 635
Rick Ferdig, Kent State University, United States; Leanna Archambault, Arizona State University, United States; Kerry Rice, Boise State University, United States; Margaret Niess, Oregon State University, United States; Trisha Litz, Regis University, United States; Amy Garrett-Dikkers, University of North Carolina Wilmington, United States; Aimee Whiteside, University of Tampa, United States; Michael Barbour, Touro University, United States; David Marcovitz, Loyola University Maryland, United States; Antoinette Davis, Eastern Kentucky University, United States
Online Student Teaching with Undergraduate Preservice Teachers ........................................ 640
Kevin J. Graziano & Lori Feher, School of Education, Nevada State College, United States

Blogging and Microblogging for Community Building in a Virtual Field Experience ................................................................. 649
Brianne Jackson & W. Monty Jones, Virginia Commonwealth University, United States

Online Constructivism: Tools and Techniques for Student Engagement and Learning ........................................................................ 656
Michael Kosloski, Old Dominion University, United States; Diane Carver, Bethel School District, United States

Flipped Instruction in a Blended Learning Environment .......................................................... 667
Karen Lackey, University of North Texas, United States

Designing a system to support curriculum design and student learning: understanding by design and flipped classrooms ........................................ 671
Chun-Yi Lin, Tamkang University, Taiwan

Innovation in Design of Project-Based Learning for the K-12 Online Context ........................................................................... 677
Anissa Lokey-Vega, Kennesaw State University, United States; Kimberly Bondeson, Gwinnett Online Campus, United States

Perceptions of K-12 Online Teaching Endorsement Program Effectiveness in Georgia: A Case Study .................................................. 685
Leslie Pourreau & Anissa Lokey-Vega, Kennesaw State University, United States

Effective online learning in New Zealand secondary schools ............................................. 692
Keryn Pratt & Sandra Williamson-Leadley, University of Otago, New Zealand

Virtual schools are COOL but a hot topic: Exploring the proposed introduction of virtual charter schools in New Zealand ........................................... 696
Keryn Pratt & Sandra Williamson-Leadley, University of Otago, New Zealand

Revising the iNACOL Quality Standards for Online Education: Considerations for Students with Disabilities .......................................................... 700
Mary Rice, Jesse Pace & Daryl Mellard, University of Kansas, United States

Tech2Teach: Making the Future Ready Shift through a Blended Learning Initiative ........................................................................... 709
Kenton Smith & Seth Hamilton, MSD Washington Township, United States
Digital Tools for English Language Learners in Blended Learning Environments ................................................................. 714
Anne Wall, Austin Peay State University, United States

Best Practices in Implementing an Online Learning Program for Elementary Literacy Intervention ................................................................. 718
Melissa Warr, Brigham Young University, United States; Nari Carter, Imagine Learning, United States

New Zealand teacher educators’ knowledge of and attitudes towards online and blended learning ................................................................. 724
Sandra Williamson-Leadley & Keryn Pratt, University of Otago, New Zealand

COBRIX: A Physical Computing Interface for Blind and Visually Impaired Students to Learn Programming ................................................................. 727
Jung-Hyun Ahn & Woonhee Sung, Teachers College, Columbia University, United States; Sun Woong Lee, Kwangwoon University, Korea (South); Jang Hee I, Georgia Institute of Technology, United States

A Conceptual Framework for Mobile Learning in Saudi Higher Education ............... 734
Hayat Alajlan, King Saud University, Saudi Arabia

Project-Based Foreign Language Learning in a Mobile-Blended Collaborative Learning Setting: A Case Study of EFL Learners ................................................................. 740
Hulya Avci, Beykent University, Turkey; Tufan Adiguzel, Bahcesehir University, Turkey

Micro Units – A New Approach to Making Learning Truly Mobile ................................................................. 744
Marc Beutner, University of Paderborn, Germany; Rasmus Pechuel, Ingenious Knowledge GmbH, Germany

Mobile Game-Based Learning: Exploring the Anytime, Anywhere, and on Any Device Characteristics of Mobile Devices ................................................................. 752
Boaventura DaCosta, Solers Research Group, United States; Soonhwa Seok, Korea University, United States

Preservice Teachers’ Motivational Reactions to Online Instructional Materials on Immersive Technology ................................................................. 757
Kevin J. Graziano, Nevada State College, United States; Shawn Daley, Concordia University, United States

The Application, Benefits, and Challenges of Flipped Learning with Preservice Teachers ................................................................. 766
Kevin J. Graziano, School of Education, Nevada State College, United States

Parents’ Perceptions and Concerns of a 1:1 Laptop Initiative: Implications for Teacher Education ................................................................. 776
Yi Jin & Denise Schmidt-Crawford, Iowa State University, United States
An Innovative Teaching Mode of Integrating Mobile Learning with Language Learning ................................................................. 784
Xiaorui Sun, Inner Mongolia Normal University, P.R.China, China

Participatory Action Research: Building an Understanding of EAL Mobile Vocabulary Strategies ........................................................................................................................................... 790
Ewa Wasniewski, Tariqa Tandon & Michelle Lalonde, MacEwan University, Canada

Open Educational Practice and Preservice Teacher Education: Understanding past practice and future possibilities ........................................................................................................................................... 798
Peter Albion & David Jones, University of Southern Queensland, Australia; Chris Campbell, Griffith University, Australia; Janice Jones, University of Southern Queensland, Australia

Online tools for small-group discussion: a comparison between threaded forums and collaborative mind-maps ........................................................................................................................................... 807
Rosa Cendros Araujo & George Gadanidis, Western University, Canada

Hybrid Cloud and Its Application in IT Education ................................................................................................................................. 815
Li Chao, University of Houston - Victoria, United States

A Digital Curation Platform: NTNU Curation ........................................................................................................................................... 822
Chiung-Hui Chiu, Ying-Chun Chou, Jing-Man Lin, Yu-Ting Chiu, Yu-Wei Chan & Jui-Lin Weng, Graduate Institute of Information and Computer Education, National Taiwan Normal University, Taiwan

Recognizing Design-Based Research as Coursework and Experiential Support: Micro-Learning as Integrated Teacher Candidate Coursework and Field-Based Understandings ........................................................................................................................................... 827
Caroline M. Crawford, University of Houston-Clear Lake, United States; Melissa Semeniuk, University of North Texas, United States

From Pepe to Facepalm Picard: Bridging the ASD Communications Gap Using Memes ........................................................................................................................................... 833
Douglas Darby, University of North Texas, United States

Greening School Curriculum with Technology: A Case Inquiry ........................................................................................................... 835
Elva Duenez, Hutsell Elementary, United States; Irene L. Chen, University of Houston Downtown, United States

Creating Simple iPad Games to Consolidate Understanding ........................................................................................................... 840
Leslee Francis-Pelton & Timothy Pelton, University of Victoria, Canada
Social Media Use in Post Secondary Education with Undergraduates: A Literature Review ................................................................. 845
Cynthia Gomez, New Mexico State University, United States

Help from Friends: Facebook’s Potential for Adolescents’ Academic Help-seeking ............................................................................. 852
Christine Greenhow, Amy Chapman & Ming Lei, Michigan State University, United States

Social Scholars: Re-envisioning Graduate Education in the Age of Social Media ..................................................................................... 856
Christine Greenhow, Holly Marich & K. Bret Staudt Willet, Michigan State University, United States

Comparing Technology-Mediated Learning Environments .......................................................... 862
Tina Heafner, University of North Carolina at Charlotte, United States; Nicholas Triplett, UNC Charlotte, United States

Text Analysis of a Cloud-Based Educator Collaboration Tool .................................................. 870
Robin Henrikson & Daniel Bishop, Seattle Pacific University, United States

Piloting a Collaborative Robotics Program at a Rural Elementary School: An Agenda for Research ................................................................................. 877
Jacqueline Kaminski Mumford, Walsh University, United States; Bridget Scofinsky, Damascus Elementary, United States; Connie Smith & Marietta Daulton, Walsh University, United States

An Investigation of Turkish Pre-service Teachers’ New Media Literacy ........................................... 883
Mehmet Kara, Amasya University, Turkey; Sonay Caner, Middle East Technical University, Turkey; Ayse Günay Gökben, Burdur Gölhisar Konak Ortaokulu, Turkey; Esra Isgör Simsek, Yalova University, Turkey; Behice Ceyda Cengiz, Bülent Ecevit University, Turkey

Preferences for Information Seeking and Information Sharing Among Taiwanese Learners ................................................................. 887
Yu-Chun Kuo, Rowan University, United States; Hungwei Tseng, Jacksonville State University, United States

Infrastructure Support for Boundary Crossing and Teacher Professional Development: An Activity Theory Perspective ......................................................................................... 892
Therese Laferriere, Laval University, Canada; Alain Breuleux, McGill University, Canada; Allaire Stéphane, UQAC, Canada; Christine Hamel, Laval University, Canada; Sandrine Turcotte, UQO, Canada

Teaching and Learning with Smart Board Technology in the Elementary Classroom ......................................................................................... 896
James Oigara, Canisius College, United States
Multimedia, Design, and Storytelling Principles Supporting the Creation of Learning Resources ................................................................. 900
Timothy Pelton & Leslee Francis-Pelton, University of Victoria, Canada

Augmented Reality and 3D Modeling – A Programming-Free Approach .................. 906
Kayla Sappington, University of North Texas, United States

Using Technology to Revolutionize Child Welfare Training ................................. 909
Valerie Simmons, Ben Clark & Brian Nethero, Arizona State University, Mary Lou Fulton Teachers College, Sanford Inspire Program, United States

Motion Detection Method for Video Feedback System to Assist Karate Training ................................................................. 915
Kazumoto Tanaka, Kindai University, Japan

Teaching Beyond the Three R’s: The Case for Teaching Digital Literacy ................... 919
Kelly Torres & Aubrey Statti, The Chicago School of Professional Psychology, United States

The potential for haptic-enabled interaction to support collaborative learning in school biology .............................................................................................................................. 927
Mary Webb, King’s College London, United Kingdom; Megan Tracey, King’s College London, United Kingdom; William Harwin, Ozan Tokatli & Faustina Hwang, University of Reading, United Kingdom; Ros Johnson, The Abbey School, Reading, United Kingdom; Natasha Barrett & Chris Jones, University of Reading, United Kingdom

Engineering Innovative Transdisciplinary Projects: Gallery Walk ......................... 936
Melda Yildiz, New York Institute of Technology, United States

Novice Teachers Integration of Technology into Classrooms ........................................ 941
Manjari Banerjee & Hersh Waxman, Texas A&M, United States

Perceptions of Early, Mid or Late Career Teachers Regarding Technology Integration, Technology Proficiency and Access to Tools and Resources ................................................. 946
Rhonda Christensen & Gerald Knezek, University of North Texas, United States

Technology-Related Teacher Professional Development: Longitudinal Results of State-Wide Needs Assessments ................................................................. 954
Jacque Ewing-Taylor, University of Nevada, Reno, United States; Bill Thornton & Daniel Monk, University of Nevada, United States

Examining associations between perceptions of junior high friends and learning computer programming with implications for teacher preparation ......................... 960
Takahisa Furuta, Education, Gunma University, Japan; Gerald Knezek, University of North Texas, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, United States
Efficient and Cost-effective Class Attendance Management with a Smartphone-based System ................................................................. 965
Eugene Garcia, Hugo Rivera, Nico Ponder, Rita Kuo & Jun Zheng, New Mexico Institute of Mining and Technology, United States

Charting New Directions in Educational Research ................................................. 973
David Gibson, Curtain University, Australia; Gerald Knezek, University of North Texas, United States; Dirk Ifenthaler, University of Mannheim, Germany; Joke Voogt, University of Amsterdam, Netherlands; Rhonda Christensen, University of North Texas, United States; Kim Schildkamp, University of Twente, Netherlands

A Method for Visualizing the Sharing Context in Higher Education Services ................................................................. 980
Yushun Idei, Daiki Mori, Ryota Sugino, Koji Kimita & Yoshiki Shimomura, Tokyo Metropolitan University, Japan

1:1 Laptop Experience and High-Stakes Testing: Effects on Eighth-Grade Student Achievement ................................................................. 985
Lea Johnson & Denver Fowler, The University of Mississippi, United States

Teacher Education Students’ Perceptions of a Peer Assessment Model .............. 1010
Lan Li, Bowling Green State University, United States; Xiongyi Liu, Cleveland State University, United States

Effect of a Makerspace Training Series on Elementary and Middle School Educator Confidence Levels Toward Integrating Technology .............................................. 1015
Jennifer Miller, University of North Texas/Birdville ISD, United States; Rhonda Christensen & Gerald Knezek, University of North Texas, United States

An Examination of the Correlation between Teacher Perception of Technology Integration and Student Success on Standardized Achievement Tests .............. 1021
Vince Moore & Michael Serfin, University of North Texas, United States

Family Perspectives on Teacher Communication Through Technology .............. 1028
Kirstin Natale & Kathryn Servilio, Monmouth University, United States

Validation of Mobile Phone Use in the Classroom Survey .................................. 1033
Blanche O’Bannon, Karee Dunn & Yujeong Park, University of Tennessee, United States

Preliminary Results of a Delphi Study to Identify Teacher Competencies Needed in One-to-One Learning Environments .................................................. 1042
Andrea Parrish & William Sadera, Towson University, United States
Ray Pastore, University of North Carolina Wilmington, United States; Jessica Briskin, Senior Learning Design and Developer at ARMS, Inc. and Ph.D. candidate at Penn State University, United States; Tutaleni I. Asino, Oklahoma State University College of Education, United States

Do secondary pre-service teachers have what it takes to educate learners with special educational needs? ............................................................. 1051
Petrea Redmond, University of Southern Queensland, Australia; Jennifer Lock, University of Calgary, Canada

Pre-Service Teachers’ Perceptions about Identifying, Managing and Preventing Cyberbullying ................................................................. 1057
Petrea Redmond, University of Southern Queensland, Australia; Jennifer Lock, University of Calgary, Canada; Victoria Smart, University of Southern Queensland, Australia

Effective Planning Strategy in Robotics Education: An Embodied Approach ....................................................................................... 1065
Woonhee Sung, Jung-Hyun Ahn, Shi Ming Kai & John Black, Teachers College, Columbia University, United States

Comparative Study on the Effects of Making Students Create Questions and Answers for Quizzes .......................................................... 1072
Toshihiko Takeuchi, Tokyo University of Social Welfare, Japan; Shogo Kato, Tokyo Woman’s Christian University, Japan; Yuuki Kato, Sagami Women’s University, Japan

The International Handbook of Information Technology in Primary and Secondary Education: Part 1 ......................................................... 1078
Joke Voogt, University of Amsterdam, Netherlands; Gerald Knezek & Rhonda Christensen, University of North Texas, United States; Kwok Wing Lai & Keryn Pratt, University of Otago, New Zealand; Peter Albion, University of Southern Queensland, Australia; Jo Tondeur, Vrije Universiteit Brussel/ Ghent University, Belgium; Mary Webb, King’s College London, United States; Dirk Ifenthaler, University of Mannheim, Germany; David Gibson Gibson, Curtin University, Australia; Paul Resta, University of Texas, United States; Thérèse Laferrière, Laval University, Canada; David Slykhuis, James Madison University, United States

The International Handbook of Information Technology in Primary and Secondary Education: Part 2 ......................................................... 1082
Joke Voogt, University of Amsterdam, Netherlands; Gerald Knezek & Rhonda Christensen, University of North Texas, United States; Kwok Wing Lai & Keryn Pratt, University of Otago, New Zealand; Peter Albion, University of Southern Queensland, Australia; Jo Tondeur, Vrije Universiteit Brussel/ Ghent University, Belgium; Mary Webb, King’s College London, United States; Dirk Ifenthaler, University of Mannheim, Germany; David Gibson Gibson, Curtin University, Australia; Paul Resta, University of Texas, United States; Thérèse Laferrière, Laval University, Canada; David Slykhuis, James Madison University, United States
Benefits and Challenges of Design-Based Learning in a Middle School Classroom
Teri Wagner, Hollins University, United States; Katherine Cennamo, Virginia Tech, United States

How Do I Know It's Working? A Teacher's Search for Evidence
Melissa Warr & Richard West, Brigham Young University, United States

A Three-pronged Conceptual Framework for Developing an Effective and Sustainable K-12 Educational Technology Environment
Dowayne Davis, New Jersey City University, United States

The experience of a first-year principal transforming teaching and learning in a one-to-one computing environment
Stefani N. Pautz & William A. Sadera, Towson University, United States

The Influence of Coaching Tactic on Workplace Subjective Well-Being and Psychological Capital
Yi Ping Lin & Shinyi Lin, National Taichung University of Education, Taiwan

Whose Job Is It...Anyway??: Examining Factors That Contribute to Successful Employment Outcomes
Leonard Moore & Kamisha Kirby, NC State University, United States

Teacher Education to Workforce Education: A TPACK-inspired Workforce Education Program Proposal
George Semich & John Hineman, Robert Morris University, United States

Mapping the instructional event
Terence Ahern, Matthew Anderson & Nicholas Bowman, West Virginia University, United States

Wearable Technology: It Has a Place in Schools
Cindy Anderson, Roosevelt University, United States; Anderson Kevin, andersonk@epcusd401.org, United States

Wearable Technology in Schools: Theoretical Support for Practical Implementation
Stephanie Barbee, University of North Texas, United States

e-MEMENTO : a smartwatch experiment to investigate rote memorization in the connected age
Anne-Dominique Salamin & Christophe Hadorn, University of Applied Sciences Western Switzerland (HES-SO), Switzerland
Reflective Practice: Using Google Drive to Improve the Quality of Learning Experiences during Clinical Teaching ................................................................. 1141
Phillip J Blacklock & Daphney L Curry, Midwestern State University, United States; Linda K Lilienthal, University of Nebraska Kearney, United States

Documenting Required Evidence of Activities during Student Teaching Hours and Training Using the Qualtrics Offline App for Students and Supervisors ................. 1144
Chris Boosalis, Sacramento State, United States; Oddmund Myhre, California State University, Stanislaus, United States; Caroline Turner, Sacramento State, United States

Influences of Preservice Teachers Frequent Formative Feedback in a Hybrid Learning Environment ................................................................. 1152
Laurie O. Campbell & Tracey Planinz, University of Central Florida, United States; Lindsey Pulse, The University of Central Florida, United States

A Process To Develop A Digital Storytelling Electronic Portfolio: Final Reflective Course Assessment ................................................................. 1158
Larry Ferguson, Norfolk State University, United States

Fusing Mentorship with Common Core Standards Through Asynchronous Screencasting Feedback ................................................................. 1160
Luanne Fose & Martin Mehl, California Polytechnic State University, San Luis Obispo, CA, United States

Reflections on Classroom Practices ................................................................. 1167
James Jurica & W. Sean Kearney, Texas A&M University San Antonio, United States

Design and Implementation of Student Mastery Data System to Promote Learner-Centered Model of Instruction ................................................................. 1173
Steve Padere, Carson City School District, United States; Bill Thornton, University of Nevada, Reno, United States; Ricky Medina, Carson City School District, United States

Ensuring success on the edTPA; the use of webinars in ethical coaching of distance teacher candidates ................................................................. 1179
Roxanne Pickle, Bemidji State University Minnesota, United States

The Alaskan JournEy Portfolio Project ................................................................. 1185
Hilary Seitz, University of Alaska Anchorage, United States; Jenna Baldieviz & Mindi Vogel, Anchorage School District, United States

Student-Created Reflective Video as Meaningful Formative and Summative Assessment During Hands-On Learning Experiences ................................................................. 1191
Shaunna Smith, Texas State University, United States
Data Driven Decision Making: Integrating Authentic Technologies in Teacher Preparation ................................................................. 1199
Jason Trumble, Donna Wake & Michael Mills, University of Central Arkansas College of Education, United States

Feeding it forward: Examining the Potential Pitfalls of Online Feedback .................. 1206
Michelle Vaughan & Samantha Uribe, Florida Atlantic University, United States

Assessing Students’ Success Through Use of ePortfolio .......................................... 1211
Diane Wilcox, Sevinj Iskandarova, Oris Griffin & Jane Thall, James Madison University, United States

Rethinking Assessment and Evaluation: Different Countries Similar Issues ................................................................. 1215
Melda Yildiz, New York Institute of Technology, United States

The Relationship Between Computational Thinking (CT) Skills and Generative Learning Theory (GLT) ................................................................. 1224
Abdulaziz A Alfayez, University of Toledo, United States

Assessing the Creativity of Middle School Students: A Case Study with Digital Information in the Public Interest ................................................................. 1231
Emilia Askari, Michigan State University, United States

Competency-based Technological Andragogy and Content Knowledge: The (C-TACK) Model ................................................................. 1239
Prince Bull, North Carolina Central University, United States

Look Mom, I earned another badge in class today! .................................................... 1244
Barba Patton & Teresa LeSage Clements, University of Houston-Victoria, United States

Sketchnoting: You and Your Students will Benefit .................................................. 1248
Karin Perry & Holly Weimar, Sam Houston State University, United States

The Ability to Problem Spot: A Comparison of British and American Students Ability to Identify Opportunities for Innovation ......................................................... 1256
Geoff Wright, Brigham Young University College of Engineering, United States

E-Learning in PreK-3: What happens when Gen X designers create online tutorials for Gen Z learners? ................................................................. 1260
Stephen Arnold, University of Arizona - South Campus, United States
STEAM into Literacy: Teachers Need More Time and Students Need More Opportunity for STEAM ................................................................. 1265
Aimee Barber, Marietta Adams & Douglas Williams, University of Louisiana at Lafayette, United States

Early Childhood Education Through the Lens of Parental Involvement and Technology .............................................................. 1271
Kimyata Dilworth & Albertha Lawson, Southern University and A & M College, United States

Online Learning in Pre-Service Teacher Education: A Comparison of Student Progress in a Traditional and Online Development and Learning Theory Course ....................... 1277
Amanda Hurlbut, Texas Woman's University, United States

Determining Relevant Tablet Integrations in Early Childhood & Family Science Classrooms: A Case for Negotiation in the Paradigm Shift .................................................. 1283
Nicole Masek & Sharla Snider, Texas Woman's University, United States

Early Childhood/Elementary On-going Assessment: Characteristics of Developmentally Appropriate Technology-Enabled Formative Assessment Tools .......................... 1292
Esther Ntuli, Idaho State University, United States

Taiwanese Teachers’ Self-efficacy Towards Inclusive Education ................................................................. 1297
Ajay Singh, Eastern New Mexico University, United States; Chia Jung Yeh & Aspen Yordy, East Carolina University, United States; Chih-Hung Chung, Tamkang University, Taiwan

Designing a Completely Online Course to Prepare Elementary Teacher Candidates to Integrate the Arts across the Curriculum ................................................................. 1302
Kathleen Tate & Brian Faulkner, American Public University, United States

Exploring the usability and acceptability of free mobile applications for young children in Obesity Intervention Curriculum ................................................................. 1307
Chia Jung Yeh, Bernice Dodor, Alaina Purvis & Kristen Mahaffy, East Carolina University, United States

Exploration of Students’ Experiences and Perceptions in Global Perspectives in Early Care and Education Course ................................................................. 1312
Chia-Jung Yeh, Sheresa Blanchard, Barbara Brehm & Talaileva Faapoi, East Carolina University, United States

Eye Tracking in Game-based Virtual Language Learning Environment ....................... 1319
Yu-Li Chen, Department of Applied Foreign Languages, Lunghwa University of Science and Technology, Taiwan, Taiwan; Chun-Chia Hsu, Department of Culture Creativity and Multimedia, Lunghwa University of Science and Technology, Taiwan, Taiwan
Authentic Audiences for Struggling Readers: A Case Study Using Goodreads in a High School Classroom ................................................................. 1324
Matthew Duvall & Brian Smith, Drexel University, United States

Scoring validity: Designing and implementing an online training module for rater training ................................................................. 1333
Cristina Perez-Guillot & Julia Zabala-Delgado, Universitat Politecnica de València, Spain

Preservice Teacher Inquiry Cycles in a Technology in Education Course: Emerging Maker Dispositions Toward an Inquiry Stance for Education ................................. 1339
Aimee Barber, Douglas Williams & Nathan Dolenc, University of Louisiana at Lafayette, United States

iMakers: The who, the what and the how ................................................................. 1345
Loretta Donovan & Tim Green, Cal State Fullerton, United States; Jennifer Ponder, University of Alabama at Birmingham, United States

Diffusion and Adoption of FIRST LEGO League in Louisiana ........................................ 1351
Guolin Lai, University of Louisiana, United States; Long Li, LSUE, United States; Douglas Williams, Aimee Barber & Nathan Dolenc, University of Louisiana, United States

Mapping Elementary and Middle School Makerspace Environments to Curriculum Content through STEAM (Science, Technology, Engineering the Arts, and Mathematics) Challenge Cards .................................................. 1357
Jennifer Miller, University of North Texas/Birdville ISD, United States

The Engineering Education Maker Identity Project: Process and Tools as Boundary Objects within Cross-Disciplinary Collaboration ................................................................. 1365
Shaunna Smith, Kimberly Talley, Araceli Ortiz & Vedaraman Sriraman, Texas State University, United States

Building Connections through Teacher Librarian Collaboration ........................................ 1372
Sheila F Baker, Michelle Giles & Jana Willis, University of Houston-Clear Lake, United States

Educating about Data Privacy: A Study of College Student Perceptions and Experiences ................................................................................................. 1379
Catherine F. Brooks, Betsy A. Williams & Diana Daly, University of Arizona, United States

Digital Equity through a Social Justice Lens: A Theoretical Framework .......................... 1385
Suguna Chundur, University of Cincinnati - Clermont College, United States

Comparison of Abstraction in Computer Coding and in Critical Thinking .......................... 1394
Christine Liebe, Walden University, United States
Defining and Assessing Digital Literacy ................................................................. 1403
Jason Powell, The University of North Texas, United States

Creative Applications of LibGuides to Teach Undergraduate Students Information
Literacy Skills ........................................................................................................... 1407
Jillian Powers, Ann Musgrove & Lauri Rebar, Florida Atlantic University, United States

Achieving Reading Competency: Factors That Influence Perceptions and Behaviors
With Regard to Digital vs. Print Text ........................................................................ 1414
Soonhwa Seok, Korea University, United States; Boaventura DaCosta, Solers Research Group, United States

Implications from the Past: African American Youth and Social Media Civic
Engagement .................................................................................................................. 1420
Daniella Smith, University of North Texas, United States

Student Perceptions of Gamification in Higher Education .................................. 1428
Curby Alexander, Texas Christian University, United States

Navigating the Blended Learning Classroom: One Teacher’s Perspective on Designing
and Delivering Blended Instruction ......................................................................... 1434
Adam Barger, Mark Hofer & Lindy Johnson, The College of William and Mary, United States

Digital Games and Student Learning ......................................................................... 1443
Lorraine Beaudin & Tessa Sivak, University of Lethbridge, Canada

Using Multi-user Software to Teach Classification .................................................. 1448
Otto Borchert, Katy Cox, Guy Hokanson & Brian Slator, North Dakota State University, United States

Faculty Teaching Faculty: A Model of Professional Development for Mobile Learning
Integration in Higher Education ............................................................................... 1454
Devshikha Bose & Lana Grover, Boise State University, United States

Gaming the System: Helping Students Level-Up Their Learning ....................... 1460
Stein Brunvand & David Hill, University of Michigan-Dearborn, United States

Personalization of a Theoretical Course in Extracurricular Activities ................ 1467
Sonay Caner & Göknur Kaplan Akilli, Middle East Technical University, Turkey

Repurposing Public Domain Literature into Open Source Educational
Resources ...................................................................................................................... 1473
Terence Cavanaugh, University of North Florida, United States
Enhancing Student Learning Experience by Implementing an Electronic Voting System: A Quasi-experimental Approach .......................................................... 1479
Pao-Nan Chou, National University of Tainan, Taiwan; Wei-Fan Chen, Penn State University, United States

Virtual Laboratory of the Magnetic Field due to a Current Element ......................... 1484
Yu-Hur Chou, Tunghnan University, Taiwan; Hsin-Yih Shyu, Tamkang University, Taiwan

The Versatility of simSchool in Teacher Preparation .............................................. 1490
David Collum & Melanie Bishop, Missouri Baptist University, United States; Larinee Dennis, Hannibal LaGrange, United States; Timothy Delicath, Missouri Baptist University, United States

Taking Sheltered Instruction Digital: A Review of Classroom Technologies that Support ELL Students ................................................................. 1498
Daphney L. Curry, Emily Reeves, Christina J. McIntyre & Dittika Gupta, Midwestern State University, United States

Universal Design for Learning (UDL) in Higher Education: Possibilities, Pitfalls & Practices .......................................................... 1501
Elizabeth Dalton, University of Rhode Island and Dalton Education Services International, United States; Susie Gronseth, University of Houston, United States; Cindy Anderson, Roosevelt University, United States

Knowledge Flows in a Learning Process: the DDK Model .............................. 1507
Nicoletta Di BLAS, DEIB- Politecnico di Milano, Italy; Paolo Paolini, DEIB-Politecnico di Milano, Italy

Don't fear the snakes: designing a hybrid practical experience for preservice teachers in an afterschool Python programming robotics club .............................. 1515
Tonia A. Dousay, Debbie Swierczek, Samantha Smith & Emily Owsley, University of Wyoming, United States

Active Student Involvement in Online Courses Using Content Enhancement and Learner Reflections ................................................................. 1519
Barbara Duchardt, Ron McBride, Steve Horton & Paula Furr, Northwestern State University, United States

International Professional learning Communities .................................................. 1522
Stephanie Edwards, Utrecht University of Applied sciences, Netherlands

Blogging to Influence: Identifying Factors to Fuel Technology Integration .......................................................... 1535
Nikleia Eteokleous, Frederick University, Cyprus; Efi Nisiforou, Cyprus University of Technology, Cyprus

Integrating Robotics and Programming as Cognitive-Learning Tools: Meeting Disciplinary Learning Objectives .................................................. 1545
Nikleia Eteokleous, Frederick University, Cyprus
EPIC: Educating Pre-Service in Collaboration ............................................................. 1552
Tammy Fry, Blue Valley Center for Advanced Professional Studies (CAPS), United States

Avoiding Madness in our Methods: Considerations for Twitter Research in Teacher Education ................................................................. 1558
Spencer P. Greenhalgh, Joshua M. Rosenberg & Matthew J. Koehler, Michigan State University, United States

Using digital badges in faculty development: Motivating or meaningless? .............................................................. 1562
Cindy Gunn, American University of Sharjah, United Arab Emirates

Tweeting for #Professional Capital: Preservice Teachers’ Perception and Practice .............................................................. 1568
Nandita Gurjar, None, United States; Stephen Sivo, University of Central Florida, United States

Supporting the Development of Elementary Students’ Creative Writing for Coding in the Scratch Environment ............................................................ 1578
Young Hah, QUESTABOX, United States; Heejung An, William Paterson University, United States

Immersive Learning Experiences in Teacher Education ............................................................ 1586
Patrick Hales & Maria Kalyvaki, South Dakota State University, United States

Student perceptions of the impact of the COVA approach on their ePortfolios and authentic projects in the Digital Learning and Leading program ...................................................... 1588
Dwayne Harapnuik, Tilisa Thibodeaux & Cynthia Cummings, Lamar University, United States

Development of Museum Learning Experience Using Virtual Reality and Mobile Devices .............................................................. 1592
Jason Harron, Anthony Petrosino & Sarah Jenevein, The University of Texas at Austin, United States

Training Teachers at all Levels in Pedagogical Approaches and Methods for Online and Blended Learning ............................................................. 1598
Harald Haugen, Western Norway University of Applied Sciences, Stord, Norway, Norway; Bodil Ask & Sven Aake Bjoerke, University of Agder, Norway

The Association between Technology and Student Achievement in US History ............................................................. 1607
Tina Heafner, University of North Carolina at Charlotte, United States

Examining Technology Integration in Middle School STEAM Units ............................. 1614
Danielle Herro, Cassie Quigley, Lorraine Jacques & Abby Baker, Clemson University, United States
Use Project-Based Learning and Social Media to Improve K-12 Digital Literacy Education
Hsiaoping Hsu, Wenting Zou & Joan Hughes, The University of Texas at Austin, United States

Amazon Echo: Emerging technology for formal or informal learning? Federica Incerti, Self-represented, as an Ohio University's doctoral, United States

K12 Online and Blended Learning: Current Research and Challenges into Implementation and Teacher Education. Brianne Jackson, Virginia Commonwealth University, United States; Michael Barbour, Touro University, California, United States; Rebecca Parks, Mansfield University, United States; Kathryn Kennedy, Michigan Virtual University, United States

Preparing L2 Teachers to Teach with Technology: A Critical Review of Research Studies Nadia Jaramillo Cherrez, Iowa State University, United States

From learning with MOOCs to Using Twitter for Professional Development:Revisiting major issues in information technology and education in Canada Thierry Karsenti & Bruno Poellhuber, University of Montreal, Canada; Martine Mottet, Laval University, Canada; Pascal Grégoire & Glorya Pellerin, University of Quebec in Abitibi-Témiscamingue, Canada; Normand Roy, University of Quebec in Trois-Rivières, Canada; Julien Bugmann & Stephanie Simard, University of Montreal, Canada

Facebook Faculty and Tweeting Teachers: Social Media as a Learning, Development, and Support Mechanism for Pre-Service, In-Service, and Post-Service Educators Teresa Kelly, Stephanie Thompson, Barbara Green & Josef Vice, Kaplan University, United States

Pre-service Teachers' Perspectives towards Blended Learning Olha Ketsman, Northern Illinois University, United States

Teaching Using Social Media: Insights from Developing and Teaching a Psychology of Social Media University Course Brian Kinghorn, Marshall University, United States
Assessment of the Curriculum Design of a Science Teaching Method: Increasing Pre-service Teachers’ Teaching Skills Using ICT ............................................................... 1666
Takeshi Kitazawa, Tokyo Gakugei University, Japan; Satoru Fujitani, Mejiro University, Japan; Toru Fukumoto, National Institute for Educational Policy Research, Japan

Tweeting with Intention: Developing a Social Media Pedagogy for Teacher Education ............................................................................................................. 1674
Daniel G Krutka, Texas Woman’s University, United States; Nicole Damico, University of Central Florida, United States

Open And Distance Learners' Perceptions of Transactional Distance in Synchronous Online Learning Environments ................................................................. 1679
Alper Tolga Kumtepe, Evrim Genc Kumtepe & Ayfer Beylik, Anadolu University, Turkey

Differences in Student Motivation and Orientation between Quest-Based and Traditional College-Level Courses ................................................................. 1685
Judy Lambert, University of Toledo, United States

Student Perceptions about Using Second Life in Online Communication: A Case Study ........................................................................................................... 1689
Angela M. Lee & Leping Liu, University of Nevada, Reno, United States

The Potential of Social Media for Enhancing the Intercultural Development of Preservice Teachers .................................................................................. 1695
Ming Lei, David Wong & Kathryn Appenzeller, Michigan State University, United States

Using SignUpGenius to Assist With Education Student Communication and Scheduling ........................................................................................................ 1701
Linda K Lilienthal, University of Nebraska Kearney, United States; Phillip J Blacklock & Daphney L Curry, Midwestern State University, United States

Examining Teachers’ Use of iPads in Instruction .................................................. 1705
Min Liu, Amanda Willmann, Cynda Fickert & Yujung Ko, The University of Texas at Austin, United States

Light Blocks! Learn about physical computing by using code with LEDs. ................................................................................................................................. 1714
Susan Molnar, Purdue University, SuMo Design Workshop, United States

Learning with Limitations: The Role of Technology in Addressing the Educational Needs of Students with Disabilities ...................................................... 1717
Leonard Moore, North Carolina State University, United States
At first I was really nervous: Integrating mixed reality simulations into urban preservice teacher coursework ................................................................. 1722
Kristin Murphy & Janna Kellinger, University of Massachusetts Boston, United States

The Virtual Pathway to College and Career Readiness ........................................... 1727
Matthew Ohlson & Justin Lerman, University of North Florida, United States; Joseph Theobold & Rudy Jamison, United States

Middle School Teachers’ Perceptions of iPad Use in the Classroom ....................... 1732
James Oigara & Janet Ferguson, Canisius College, United States

Enhancing Instruction With Technology Via Strong College-School Partnership ........................................................................................................ 1741
Alex Pan & Anthony Conte, The College of New Jersey, United States

Educating Avatars: Using Disciplinary Literacy Strategies in Virtual Classrooms ........................................................................................................ 1746
Jay Percell, Illinois State University, United States

Use of Infographics to Support Note Taking .............................................................. 1752
Lori Petty, Karen Sykes & Lance Dugger, University of Mary Hardin-Baylor, United States

Working with Parents to Successfully Integrate Personal Handheld Mobile Technology in the K-12 Classroom ................................................................. 1757
Joseph Riddle, University of North Texas, United States

Welcome to the Virtual Social-Emotional Academy: What a State Mandate for SEL Taught Us About the Power of Integrating Information Technology in Teacher Education ........................................................................................................ 1763
Karen J. Riem & Carol M. Ciotto, Central Connecticut State University School of Education & Professional Studies, United States; Claude B. Abbott, Central Connecticut State University, Instructional Design & Technology Resource Center, United States

How Present Are You? Best Practices in Improving Social, Teaching, and Cognitive Presence in Online Graduate Education ................................................. 1770
Rena Robey, Johns Hopkins University & DoD, United States

A Comparative Analysis of Augmented Reality and Two-Dimensional Using Molecular Modeling on Student Learning ................................................................ 1774
Parviz Safadel & David White, Texas Tech University, United States
The Effect of Reflection Sheets focused on Standing-Positions for Pre-service Teacher Trainee
Masanobu Sakamoto, Aichi Institute of Technology, Japan; Daisuke Kaneko, Hokusei Gakuen University, Japan; Fredie V. Avendano, Department of Education, Philippines

Media Literacy Assignment Integration and the Challenges of Implementation
Kayla Sappington, University of North Texas, United States

What students really think about online lessons?
Tami Seifert, Kibbutzim College of Education Technology and the Arts, Israel

Exploring Virtual Reality, Synchronous Learning, and Google Apps with Preservice Teachers with an Interactive Technology Workshop and Tutorial
Peggy Semingson, University of Texas at Arlington, United States; Dana Owens, Matt Crosslin & Brian Brown, The University of Texas at Arlington, United States

Pedagogy as Presence: How Teachers can Support Consistent Outcomes in Blended Spaces
Michelle Sengara, The Alina Group, Canada

A Case Study on the Effectiveness of a Mobile Math Game Promoting Students’ Engagement in a Kindergarten Classroom
Sunmi Seol, Hye Kyung Lee & Sira Park, Enuma, Inc., United States

What is Online Teacherpreneurship and Why Does It Matter for Education?
Catharyn Shelton & Leanna Archambault, Arizona State University, United States

A Tweet by Any Other Frame: Three Approaches to Studying Educator Interactions on Twitter
K. Bret Staudt Willet, Matthew J. Koehler & Spencer P. Greenhalgh, Michigan State University, United States

Implementation of Technology Enhanced Active Learning (TEAL) classrooms: Lessons Learned
Ron Steiner, Bishop Lynch High School (Dallas, TX) and University of North Texas (Denton, TX), United States

Analysis of Learning Activities in Learning Community Using Simple Accelerometer Sensor Data
Takahiro Tagawa, Kyushu University, Japan; Yoichi Tanaka, Jin-ai Women’s College, Japan; Osamu Yamakawa, Fukui Prefectural University, Japan
#Help: The Value of Bringing World Language Pre-Service Teachers into the Fold of Professional Learning Networks with Twitter .............................................................. 1839
Karen Tharrington, North Carolina State University, United States

Essential Elements of a Learner Centered System: Common Curriculum, Aligned Assessments, and Comprehensive Tracking System. ................................................ 1844
Bill Thornton, University of Nevada, Reno, United States; Steve Pradere & Ricky Medina, Carson City School District, United States

Using Online Instruction to Teach Digital Citizenship Concepts to Pre-Service Teachers ........................................................................................................................... 1851
Terri Toland, Mohamed Ibrahim & Aileen Watts, Arkansas Tech University, United States

Blended learning: the student owns his learning environment ......................... 1860
Hans van Bergen, Hogeschool Utrecht, University of Applied Sciences, Netherlands; Stephanie Edwards & Nanda van der Stap, HU Utrecht University of Applied Sciences, Netherlands

Computer-Based Adaptive Learning in Higher Education ....................................... 1864
Jessyca Wagner, University of North Texas/Midwestern State University, United States

Using Digital Storytelling to Explore Cultural Identity Development in Counseling Programs .............................................................................................................. 1867
Denelle Wallace, Norfolk State University, United States; Karla Collins, Longwood University, United States

Impact of Multimedia Learning versus Live Instruction on Adult Preparation for the Uniform Certified Public Accountant Examination ...................................................... 1873
Rick Woods, University of North Texas, United States

Adaptive Learning Technologies to Personalize Learning Environment .................. 1886
Sule Yildirim Biten, University Of Kansas, United States

TITE Problem Solving: Integrating Computing and Proving in Secondary Mathematics Teacher Education ........................................................................................................ 1894
Sergei Abramovich, SUNY Potsdam, United States; Michael Connell, University of Houston-Downtown, United States

Using Technology to Determine Factorability or Non-factorability of Quadratic Algebraic Trinomials ................................................................. 1901
John Bernard, University of Texas-Rio Grande Valley, United States; Olga Ramirez, University of Texas - Rio Grande ValleyEdinburg, TX, United States; Cristina Villalobos, University of Texas - Rio Grande Valley, United States
Stamping Functions: A Technology Immune Technology Enabled Problem within an Action on Objects Framework. ................................................................. 1907
Michael Connell, University of Houston-Downtown, United States; Sergei Abramovich, State University of New York at Potsdam, United States

Cultural Competence in Mathematics Education ................................................................. 1914
Antoinette Marie Davis, Eastern Kentucky University, United States

Project Based Learning (PBL) with Digital Storytelling Approach: Research Results of Digital Storytelling Contest (DISTCO) PBL 2016 ................................................................. 1920
Bulent Dogan, Sirin Budak & Kadir Almus, North American University, United States

How Flipping Much? Consecutive Flipped Mathematics Courses and Their Influence on Students’ Anxieties and Perceptions of Learning ....................................................... 1931
Anthony Dove & Emily Dove, Radford University, United States

Is Active Learning with Technology Changing Minority Students’ Attitudes Towards Mathematics? ................................................................................................. 1938
Kossi Edoh, North Carolina A&T State University, United States; Alexandra Kurepa & John Paul Roop, NC A&T State University, United States

Knowledge, attitudes and beliefs in teacher candidates’ classroom practice ................................................................................................................................. 1944
George Gadanidis & Rosa Cendros Araujo, Western University, Canada

The Presentation of Technology in Mathematics Textbooks Used in Content Courses for Elementary Teachers ........................................................ 1948
Mark Klespis, Victoria Hollas & Dustin Jones, Sam Houston State University, United States

Exploring Undergraduate Business Students’ Difficulties in Learning Statistics ................................................................................................................................. 1954
Guolin Lai & Douglas Williams, University of Louisiana, United States

Integrating Edutainment to Reinforce Mathematical Learning: Pedagogic Intention of Pre-Service Secondary Mathematics Students .............................................................................. 1960
Ruby Lynch-Arroyo & Joyce Asing-Cashman, University of Texas at El Paso, United States

Available Curricula for Diverse Student Populations and Applications to STEM ................................................................................................................................. 1968
Iris Minor, Florida Atlantic University, United States
Searching Mathematical Expressions with Regular Expressions Tool and Its Application to Extract Mathematical Concepts ................................................................. 1974
Yoshinori Miyazaki & Kotaro Shinshi, Shizuoka University, Japan

Mathematically Connected Communities: Flexible and Budget-Friendly Online Professional Learning Design to Promote Best Practices ......................................................... 1979
Sara Morales, Terri Sainz, Anna Espinoza & Sheila Hills, Mathematically Connected Communities, New Mexico State University, United States

Pre-Service Teachers’ Development Towards Computer Science Principles: A Career Path Predictor .................................................................................................................. 1986
Rebecca Odom-Bartel & Vivian Wright, The University of Alabama, United States

Webster, Webster. Webster Dictionary WHERE are you? .............................................. 1993
Barba Patton & Teresa LeSage Clements, University of Houston-Victoria, United States

Using a Cognitive Demand Framework to Describe Technology Effects in High School Mathematics ............................................................................................................. 1999
Kyle Schultz, James Madison University, United States

Students’ Attitudes toward the Use of Adaptive Learning Systems in Learning College Algebra ...................................................................................................................... 2005
Derar Serhan, Arizona State University, United States

Enhancing Technological Pedagogical Content Knowledge in a Technology for Teaching Mathematics Course ........................................................................................................ 2011
Aaron Trocki, Elon University, United States

Marie Utterberg, Johan Lundin & Berner Lindström, University of Gothenburg, Sweden

Secondary Mathematics Pre-Service Teachers’ Technology Selection and Way of Integration ......................................................................................................................... 2030
Erol Uzan, Indiana University Bloomington, United States

Cracks in Algebra Foundations: Designing Games to Fill Them .................................. 2035
Karin Wiburg, New Mexico State University, United States

Using Emerging Design Models to develop Mathematics Games .................................. 2043
Karin Wiburg, Julia Parra, Gaspard Mucundanyi, Ruth Torres & Joann Latorre, New Mexico State University, United States
Designing Digital Materials to Support Teacher Enactment of a Project-Based Middle School Biology Curriculum ................................................................................................................................. 2051
Janice Anderson, Kerry Bartlett, Lana Minshew, Dalila Dragnic-Cindric & Kelly Barber-Lester, University of North Carolina at Chapel Hill, United States

Three Technological Tools Used to Develop, Improve, and Analyze Teaching .................................................................................................................................................................................. 2057
Craig A Berg, The University of Wisconsin-Milwaukee, United States; Lisa Dieker, University of Central Florida, United States

Changes in Teacher Dispositions Among Participants in Hands-on Teaching of a STEM Curriculum ................................................................................................................................. 2067
Rhonda Christensen & Gerald Knezek, University of North Texas, United States

An Interdisciplinary Approach to Developing an Undergraduate Module on Biogeotechnical Engineering ......................................................................................................................................... 2074
Medha Dalal, Jean Larson, Claudia Zapata, Willi Savenye, Nasser Hamdan & Edward Kavazanjian, Arizona State University, United States

Approaching Self-Directed Learning: A Comparison of Mentoring Styles on Two Robotics Teams ............................................................................................................................................... 2080
Nathan Dolenc, Douglas Williams & Aimee Barber, University of Louisiana at Lafayette, United States

Virtual Composting, Real Pre-Service Teachers: Exploring the Use of Virtual Simulations in Collaborative Learning in Science ........................................................................................................ 2086
Dalila Dragnic-Cindric & Janice Anderson, University of North Carolina at Chapel Hill, United States

Grades 6-12 Engineering Project: Turbine Design ........................................................................................................................................................................................................... 2092
Justin Elswick, Lesia Lennex, April Haight & Hans Chapman, Morehead State University, United States

Technology Use in Secondary Chemistry and Physics Classrooms in Kentucky ........................................................................................................................................................................................................ 2097
Justin Elswick & Lesia Lennex, Morehead State University, United States

Expertise regarding Digital Equipment Use in Elementary Science Teacher-Training Course ........................................................................................................................................................................ 2100
Satoru Fujitani, Mejiro University, Japan; Takeshi Kitazawa, Tokyo Gakugei University, Japan; Toru Fukumoto, National Institute for Educational Policy Research, Japan

Excellence in Elementary School Science (EESS): Teachers’ Perceptions & Technology Integration from a Professional Development ........................................................................................................ 2105
Helen Hu & Uma Garimella, University of Central Arkansas, United States
Pokémon Go for learning: A gamification approach. .................................................. 2113
Lynn Hummel, Bloomsburg University, United States; Christopher Carnahan, New Jersey City University, United States

Switching middle school teachers onto the STEM disciplines using a pedagogical framework for technology integration: The case for High Possibility Classrooms in Australia. ................................................................. 2115
Jane Hunter, University of Technology Sydney, Australia, Australia

Using Mobile Technology as a Tool to Enhance Learning at a Children’s Museum in the Shenandoah Valley ................................................................. 2125
Sevinj Iskandarova, Oris Griffin, Samy El-Tawab & Fariss Mousa, James Madison University, United States

Eclipse 2017: Resources for Teachers to Support Space Science Engagement ................................................................. 2133
Gerald Knezek, UNT, United States; Rhonda Christensen, Institute for the Integration of Technology into Teaching and Learning, UNT, United States; Troy Cline, National Aeronautics and Space Administration (NASA), United States; Carolyn Ng, NASA, United States

Implications of Rocketry STEM Challenges for Teacher Training in Project Based Learning (PBL) Management Techniques. ................................................................. 2138
Samson Lepcha, University of North Texas, Denton, United States

Communicating in Scientific Ways with Badge and Prize Rewards ................................................................. 2142
Teresa LeSage-Clements & Barba Patton, UH-Victoria, United States

Effectiveness of Using Interactive Targeted Inverted (IGT) – Education on Students’ Learning at the Technische Universität Berlin ................................................................. 2146
Franz-Josef Schmitt, Fabian Kruse, Franziska Egbers, Sascha Delitzscher, Thilo Schönnemann, Bianca Theis, Svea Wilkening, Marcus Moldenhauer, Ricarda Wiehe, Mario Willoweit & Csongor Keuer, Technische Universität Berlin, Germany; Ahmad Al-Janazrah, Birzeit University, Palestinian Territory, Occupied; Thomas Friedrich, Technische Universität Berlin, Germany

21st Century Pedagogical Content Knowledge and Science Teaching and Learning ................................................................. 2154
Scott Slough, Stephen F. Austin State University, United States; Gregory Chamblee, Georgia Southern University, United States

Perspectives on Increasing Gender Diversity in Computing from a Cybersecurity Summer Camp Experience ................................................................. 2163
Jian Zhang, Texas Woman’s University, United States; Jonathan Gratch, University of West Georgia, United States
Recursive, Collaborative Professional Development Featuring Digitized Primary Sources and Second-Order Historical Domain Knowledge .......................................................... 2171
Cory Callahan, The University of Alabama, United States

Powerful Voices: Podcasts, History, & Social Justice .......................................................... 2179
Kathryn Dirkin, Scott Roberts & Justin Plevinski, Central Michigan University, United States

Digital Inquiry About and With Words ....................................................................................... 2185
Tina Heafner, University of North Carolina at Charlotte, United States; Nicolas Triplett, UNC Charlotte, United States; Dixie Massey, University of Washington, United States

The #sschat Network: History, Purpose, & Implications of a Subject-Area Community ................................................................................................................................. 2190
Daniel G Krutka, Texas Woman's University, United States

A Review of the Reliability of a Cross-Cultural Model for Digital Games ............... 2201
Yu-Tung Kuo, Purdue University, United States; Yu-Chun Kuo, Rowan University, United States; David Whittinghill, Purdue University, United States

Use of Web 2.0 Tools in Language Learning ...................................................................................... 2209
Oraib Mango, California State University, San Bernardino, United States

Motivation Techniques for Doctoral Students in Distance Education .................. 2214
Chantana Viriyavejakul, King Mongkut’s Institute of Technology Ladkrabang, Thailand

Engaging graduate students with guest experts: Following principles for universal design for learning (UDL) .............................................................................................................. 2223
Christine Anderson, Western Illinois University, United States

Enhancing Learning Outcomes for Students with Autism through the Use of Assistive Technology: Effect of Parent-Teacher Collaboration ................................................................. 2225
Linda Crane-Mitchell, East Carolina University, United States; Lauren Stafford, Monarch Teaching Technology, United States

The Status of Middle and High School Instruction: Examining Professional Development, Social Desirability, and Teacher Readiness for Blended Pedagogy in the Southeastern United States ............................................................................. 2236
Rebecca Parks, Mansfield University, United States; Wendy Oliver & Elaine Carson, Thrivist, United States

Using Virtual Roleplay Modules to Develop Teacher Candidates’ Competence in Communicating About Bullying ............................................................................................. 2243
Deborah Schussler, Jennifer Frank, Michelle Wright & TK Lee, Penn State University, United States; Julia Mahfouz, Pennsylvania State University, United States
Single Subject Research Design to Identify Evidence Based Practices in Early Childhood Special Education ................................................................. 2252
Ajay Singh, Eastern New Mexico University, United States; Chia Jung Yeh, East Carolina University, United States; Pankaj Khazanchi, Cobb County School District, United States

Delivery of Accommodations for Students with in Online Learning Environments: k-12 v. University Level ................................................................. 2254
Maria Earman Stetter, Roosevelt University, United States

How are Universities Serving Students with Special Needs in Online Instructional Environments? ................................................................. 2259
Maria Earman Stetter, Roosevelt University, United States

Using WebQuests to Promote Reading Comprehension for Students with Learning Disabilities ................................................................. 2262
Maria Earman Stetter, Roosevelt University, United States; Marie Tejero Hughes, University of Illinois at Chicago, United States

Gamifying TPACK: The Application of a Design-Based Teaching Strategy to Enhance Teachers’ Intrinsic Motivation toward Effective Technology Integration ............... 2269
Daniah Alabbasi, King Saud University, Saudi Arabia

From Treasure Maps to GIS: Geospatial Education ......................................................... 2280
David S. Brown, The University of Tulsa, United States; Justin M. McCrackin, Oklahoma State University, United States; Melissa Stirling, Holland Hall College Preparatory School, United States; Janet Cairns, The University of Tulsa, United States

The Power of Blogging for Teachers’ Professional Growth: Three Cases of Blogging in Teacher Education ................................................................. 2288
Tina Chaseley, Northern Arizona University, United States

TPACK Radar Diagrams - A Visual Quantitative Representation for Tracking Growth of Essential Teacher Knowledge ............................................................. 2296
Julien Corven & Ming Tomayko, Towson University, United States

Examining Perceptions and Decision-making Related to Technology Integration in the Common Core High School Classroom ............................................. 2302
Medha Dalal, Leanna Archambault, Rolando Robles & Anna Reed, Arizona State University, United States

Distributed and Dynamic TPACK as an Educational Approach .......................... 2311
Nicoletta Di BLAS, DEIB- Politecnico di Milano, Italy; Paolo Paolini, DEIB - Politecnico di Milano, Italy
Developing TPACK in Higher Education Faculty: An eLearning Mentor Strategy ............................................................................................................................ 2319
Candace Figg & Kamini Jaipal-Jamani, Brock University, Canada

Bridging Art Education and Museum Experiences through Game-Based Learning ........................................................................................................................... 2324
Aroutis Foster, Mamta Shah, Amanda Barany, Jen Katz-Buonincontro, Pooja Rangan, Kevin Gross & Robert Speck, Drexel University, United States

Development of Social Presence in an Online Masters Degree Program: Engaging a Workbench Dialectic Inquiry Model .................................................. 2327
Henry Gillow-Wiles, Southern Oregon University, United States; Margaret Niess, Oregon State University, United States

Technology Integration and Teacher Preparation: The Development of Teacher Educator Technology Competencies ............................................................................ 2336
Kevin J. Graziano, Nevada State College, United States; Teresa S. Foulger, Arizona State University, United States; Denise A. Schmidt-Crawford, Iowa State University, United States; David Slykhuis, James Madison University, United States

A Model for Teacher Epistemic Beliefs in the Integration of Educational Technology ...................................................................................................................... 2347
Rodney Greer, Auburn University, United States

Investigating the Effects of a Technology Integrated Field Experience on Teaching Using TPACK ................................................................................................................... 2351
Lisa Harris, Winthrop University, United States

Differentiating TPACK-based Learning Materials for Preservice and Inservice Teachers ........................................................................................................................... 2357
Mark Hofer & Judi Harris, School of Education, College of William & Mary, United States

Exploring Independence of Five TPACK Domains TK, PK, CK Math, CK Science, and TPACK of Pre-service Special Education Teachers. .......................... 2367
Aleksandra Kaplon-Schilis, The Graduate Center, CUNY, United States; Irina Lyublinskaya, College of Staten Island, CUNY, United States
The Technological Pedagogical Content Knowledge (TPACK) Framework: Lineages of the First Ten Years of Research: Part 1 .................................................................................................................................................. 2376
Aaron Kessler, Concordia University Chicago, United States; Michael Phillips, Monash University, Australia; Matthew Koehler, Michigan State University, United States; Punya Mishra, Arizona State University, United States; Joshua Rosenberg, Michigan State University, United States; Denise Schmidt-Crawford & Wei Wang, Iowa State University, United States; Judith Harris, College of William & Mary, United States; Chrystalla Mouza, University of Delaware, United States; Daniel Mourlam, University of South Dakota, United States; Aroutis Foster & Mamta Shah, Drexel University, United States

Pedagogical Foundation and Significance of the ICT Studies for the Teacher Trainees in Their Studies ............................................................................................................................................... 2381
Sirkku Lähdesmäki & Päivi Valli, University of Jyväskylä/Kokkola university consortium Chydenius, Finland

Modified Flipped Classroom: A Project-Based Spiraling Curriculum Model to Support Learning Efficiency and Engagement ...................................................................................................................................... 2391
Jing Liu, Xi’an Radio & Television University, China; J. Michael Blocher, Shadow Armfield & Elizabeth Moore, Northern Arizona University, United States

The Utility of TPACK in Deconstructing the Impact of an Innovative STEM Curriculum in a Chinese International School .................................................................................................................................. 2397
Gregory MacKinnon, Acadia University, Canada

Early Career Teacher Candidate TPACK Development: Implementation of a Learning Activity Types Short Course .......................................................................................................................................... 2404
Daniel Mourlam & Heather Bleecker, University of South Dakota, United States

Recurrent Education for In-Service Teachers by Interactive Learning and ICT ................................................................................................................................................................. 2410
Yoshinori Naruse, Takashi Kuroda & Haruo Hasegawa, University of Toyama, Japan

Developmental Studies for ICT utilization Leadership Training Program for the Teachers in Graduate Schools of Teacher Education ........................................................................................................................................... 2415
Wakio Oyanagi, Nara University of Education, Japan

Unpacking TPACK: reconsidering knowledge and context in teacher practice. ................................................................................................................................................................................................. 2422
Michael Phillips, Monash University, Australia; Matthew Koehler & Joshua Rosenberg, Michigan State University, United States; Benjamin Zunica, Monash University, Australia

No Lecture - No Problem: Flipping a Large Graduate Anatomy and Physiology Course ................................................................................................................................................................. 2430
Richard Pierce, Thomas Turner & Karen Abraham, Shenandoah University, United States
Simulating Preservice Teachers’ Information-Seeking Behaviors While Learning with an Intelligent Web Browser

Eric Poitras & Negar Fazeli, University of Utah, United States

Pre-Service Teacher Education for Technology Integration: Professional Identity, Experiences, and Knowledge

Mamta Shah & Sarah Ulrich, Drexel University, United States

The Development of Technological Pedagogical Content Knowledge (TPACK): Part 1

Mamta Shah, Drexel University, United States; Michael Philips, Monash University, Australia; Aaron Kessler, Concordia University Chicago, United States; Joshua Rosenberg, Michigan State University, United States; Eric Poitras & Negar Fazeli, University of Utah, United States; Amanda Barany & Aroutis Foster, Drexel University, United States

The Big Reveal: Teacher Educator Technology Competencies

David Slykhuis, James Madison University, United States; Teresa S. Foulger, Arizona State University, United States; Kevin J. Graziano, Nevada State College, United States; Denise A. Schmidt-Crawford, Iowa State University, United States

Differences in preservice teachers’ readiness to use ICT in education and development of TPACK

Erkko Sointu & Teemu Valtonen, University of Eastern Finland, Finland; Christine Cutucache, University of Nebraska at Omaha, United States; Jari Kukkonen, University of Eastern Finland, Finland; Matthew C. Lambert, University of Nebraska-Lincoln, United States; Kati Mäkitalo-Siegl, University of Eastern Finland, Finland

The TWUFCL experiment: Authentic engagement with technology for teacher candidates and education professionals.

Ludovic A. Sourdot, Chad Smith, Gina Anderson & Jerry Whitworth, Texas Woman's University, United States

Infusing Practicum Experiences with Technology Integration through an Elective Course: A Pilot Study

Marlo Steed, Faculty of Education, University of Lethbridge, Canada

The Virtual Classroom Project through Video Vignettes

Marlo Steed, Faculty of Education, University of Lethbridge, Canada

Secondary Teachers’ Understanding of and Reactions to a Failed one-to-one iPad Initiative.

Brett Tozer, Indiana University of Pennsylvania, United States

Insights into pre-service teachers’ TPACK

Teemu Valtonen, Sini Kontkanen, Jari Kukkonen, Erkko Sointu & Susanna Pöntinen, University of Eastern Finland, Finland
Teacher Candidates and Self Efficacy Using Instructional Technology .......................... 2497
Mark Viner & Ajay Singh, Eastern New Mexico University, United States

(Future) Teachers’ Use of Technology and Development of TPACK: Insights from a Global Perspective ................................................................. 2499
Joke Voogt, University of Amsterdam, Netherlands; Teemu Valtonen, Erikko Sointu, Sini Kontkanen & Susanna Pöntinen, School of Applied Educational Science and Teacher Education, University of Eastern Finland, Finland; Jo Tondeur, Ghent University/ Interfaculty Department for Teacher Education, Vrije Universiteit Brussel, Resear, Belgium; Fazilat Siddiq & Ronny Scherer, Faculty of Educational Sciences, University of Oslo, Norway; Evrim Baran, Department of Educational Sciences, Middle East Technical University, Turkey; Anneke Smits, Roland Bruijn, Henk La Roi, Floor van Renssen, Heleen Vellekoop & Lieke van Velze, Windesheim University of Applied Sciences, Netherlands; Lin Zhang, School of Foreign Languages & Faculty of Education, East China Normal University, China; Josh Rosenberg, Nichigan State University, United States

Flipping the Class Forward: Reflections on Challenges and Opportunities ................................................................. 2503
Kevin Krahenbuhl, Middle Tennessee State University, United States

Using Technology and Digital Resources to Enhance Teaching, Learning, and Scholarly Practices in Rwandan Health Sciences Higher Education ............................ 2509
Adam Papendieck, Tulane University / University of Texas at Austin, United States; Ngenzi Joseph Lune & Phil Cotton, University of Rwanda, United States; Nancy Mock & Mike Ndimurukundo, Tulane University, United States

Inclusive Technology Around the World ................................................................. 2514
Cindy Anderson, Roosevelt Univ., United States; Susan Gronseth, University of Houston, United States; Elizabeth Dalton, Dalton Education Services International, United States; Kevin Anderson, Elmwood Park, IL District 401, United States

Faculty Voices: Barriers to Implementing UDL Strategies ........................................ 2516
Nancy Chapko, Wisconsin Technical Colleges (Gateway Technical College), United States

Accessibility of Teacher Education Online Courses: Design and Assessment with a UDL Infused Technology Integration Model .................................................. 2521
Leping Liu, Wenzhen Li & Domenic Dini, University of Nevada, Reno, United States

Multilingual Multicultural Multimedia: Promoting Transdisciplinary and Inclusive Projects through Virtual and Augmented Reality ............................................. 2529
Melda Yildiz, New York Institute of Technology, United States

STEM Collaboration: Engineering and Teacher Education ........................................ 2538
Terry Smith, Radford University - School of Teacher Education & Leadership, United States; Kaitlyn Hall, Radford University, United States
An Evaluation of Social Change Games as viewed through the RETAIN model ................................................................. 2552
Laurie O Campbell & Glenda Gunter, University of Central Florida, United States

K-12 Educators’ Perspectives on Coding: Moving from “I can't” to “I do” ................ 2791
Beverly Ray, Idaho State University, United States; Reenay R. H. Rogers & Martha Hocutt, University of West Alabama, United States

Chinese Pre-service Teachers' TPACK Development and Contextual Factors ............................................................ 3405
Yining Wang, Hai Zhang, Peng Xu & Zhe Zhang, Northeast Normal University, China

Interacting with Purpose: What is the Difference Between Face-to-Face and Online Student Relationships in a Combined Program? .................. 3411
Amy Peterson, Daniel Freer & Joshua Rosenberg, Michigan State University, United States

"I'm Truly Amazed": High School Teachers Describe Their Experience with Technology-Enhanced PBL .............................................. 3415
Dalit Levy & Olga Dor, Kibbutzim College of Education, Israel

Using 360° video in Physical Education Teacher Education .......................... 3420
Lionel Roche & Nathalie Gal-Petitfaux, Université Clermont Auvergne, France