ABSTRACT
Student’s learning happens where the learner is, rather than being constrained to a single physical or digital environment. It is of high relevance for the LAK community to provide analytics support in blended learning scenarios where students can interact at diverse learning spaces and with a variety of educational tools. This workshop aims to gather the sub-community of LAK researchers, learning scientists and researchers in other areas, interested in the intersection between ubiquitous, mobile and classroom learning analytics. The underlying concern is how to integrate and coordinate learning analytics seeking to understand the particular pedagogical needs and context constraints to provide learning analytics support across digital and physical spaces. The goals of the workshop are to consolidate the Cross-LAK sub-community and provide a forum for idea generation that can build up further collaborations. The workshop will also serve to disseminate current work in the area by both producing proceedings of research papers and working towards a journal special issue.

Keywords
Learning analytics, seamless learning, integration, monitoring

1. INTRODUCTION AND MOTIVATION
Student’s learning happens where the learner is [4] rather than being constrained to a single physical or digital environment [7, 14]. Learning often occurs in spaces and at moments that go beyond formal education. Increasing access to emerging communication technologies and the proliferation of mobile and pervasive devices have made it possible for students to make use of a wide range of educational (and non-educational) tools [9]. At the same time, educational providers, including schools and universities, are continuously deploying a variety of educational technologies and pedagogical resources in both online and face-to-face settings [13]. Educational research has revealed the pedagogical benefits of letting students experience different types of content, "real world" challenges, and physical and social interactions with educators or other learners [2, 10]. Moreover, students commonly work outside the boundaries of the institutional learning system(s). They may interact face-to-face, use other educational tools or even use tools that were not specifically designed to serve in learning contexts. Teachers may want students to use not only the tools offered by the institution, but also other tools that are more suitable to the context and subject matter [12].

Pervasive and mobile technologies can be used to allow learners to get remote access to educational resources from different physical spaces (e.g. ubiquitous/mobile learning support [15, 17]) or to enrich their learning experiences in the classroom in ways that were not previously possible (e.g. face-to-face [3, 5, 10] Blended learning support [16]). In parallel, these technologies are becoming or getting embedded into everyday objects that can communicate information and generate large amounts of interaction data. This is creating new possibilities for learning analytics to provide continued support or a more holistic view about learning, moving beyond desktop-based learning resources [1, 6]. Providing continued support in the classroom, for mobile experiences and using web-based systems has been explored to different extents and each poses its own challenges [11, 12]. An overarching concern is how to integrate analytics across these different spaces and tools in a coordinated way. In short, there is an increasing interest in providing support for students’ learning across physical and digital spaces, and the means to achieve this are more readily available.

2. WORKSHOP THEMES
We will invite contributions to the Workshop on Learning Analytics Across Physical and Digital Spaces Research. Contributions should relate to the design and study of learning analytics innovations and solutions, including but not limited to any of the following themes:

1. Support Across Multiple Digital Spaces: Studies of novel combinations of analytics and instructional approaches and systems that span across multiple digital learning tools (including mining, modelling or visualising datasets that integrate logs from multiple learning tools);
2. Bridging the Physical and Digital Realms: Design and study of learning situations that include collocated settings and/or the use of online (remote access) tools (e.g. including ‘everyday’ settings, collocated collaboration situations, multi-device ecologies or blended learning cases);
3. Data Integration of Heterogeneous Learning Data Sources: Discussion of methodologies and theoretical approaches, and their technical solutions, to integrate learning activity logs from multiple sources of learner’s data (including technical but also non-technical issues such as ethics, orchestration or data management) with learning designs and strategies.

3. EVIDENCE OF INTEREST & PC
We expect to conduct a full day workshop with at least 20 participants from the sub-community of LAK researchers interested in ubiquitous, mobile and/or face-to-face learning analytics, and learning scientists and researchers from other


communities who have explored the perspective of learning across digital and physical spaces. We will encourage submission of original papers that demonstrate ways to integrate and coordinate learning analytics to provide continued support to learning across digital and/or physical spaces. A list of people who will be invited to serve on the program committee for the workshop can be found here.

Similar workshops organized by Davinia Hernandez-Leo in 2011, Roberto Martinez-Maldonado in 2012 and the first edition of Cross-LAK in LAK 2016 are indicative of sustained interest of the research community in this sub-field. The first Cross-LAK workshop was very successful in terms of papers submitted and participants.

These workshops are the following:

1) International Workshop on Learning Analytics Across Physical and Digital Spaces (Cross-LAK’ 16 held in conjunction with LAK 2016). [Website](#).

2) International Workshop on Digital Ecosystems for Collaborative Learning (DECL 2012 held in conjunction with ICLS 2012. [Website](#) and

3) International Workshop on Learning Activities Across Physical and Virtual Spaces (AcrossSpaces 2011 held in conjunction with EC-TEL 2011). [Website](#)

4. EXPECTED OUTCOMES

The expected outcomes of the workshop are the following:

Consolidating the Cross-LAK Community. This workshop will build on the design space and guidelines formulated in the first edition of Cross-LAK [8] in order to consolidate the synergy between researchers and propose further steps as a community.

Provide a forum to ignite collaboration. The workshop will bring together the sub-communities within the learning sciences, educational technology, and LAK with the goal of contributing with their expertise in identifying the major issues to be tackled in the area, generating new ideas for future research and sparking on each other in ways that can lead to future collaboration within the LAK community.

Work towards a special issue on Cross-LAK themes. Proceedings of research papers which will be produced and selected papers will be invited to be submitted in full to a special issue (SI) on Cross-LAK in an indexed journal.

5. CONCLUSION

While this workshop can be considered to be grounded on a consolidated line interest on the topic of learning across spaces, in this case the focus is on the particular challenges to provide continued support to students by using learning analytics techniques.

6. REFERENCES


LAK 2017 Program Chairs’ Welcome

We are very happy to welcome you to Vancouver, Canada, for the 7th International Conference on Learning Analytics and Knowledge (LAK’17). The Conference is organized by the Society for Learning Analytics Research (SOLAR) and for 2017, is hosted by Simon Fraser University (SFU).

The theme for LAK’17 purposely focused on the transdisciplinary nature of research in learning analytics. This theme extends the work of prior conferences that sought to bring together the diversity of disciplinary fields that now comprise learning analytics. The great diversity of papers submitted for LAK’17 demonstrates that LA research has very much embraced the benefits that can be leveraged from a truly transdisciplinary model of research. While there are inherent complexities in such an approach, the research presented for LAK’17 brings much excitement and promise to the field through the application of novel methods, cutting-edge learning technologies, and actual impact on the learning process.

Following this theme, the aim of the conference is to provide a forum for presentation, exchange and discussion of research and practices regarding the transdisciplinary field of Learning Analytics. We offer an extended scientific program with Prof. Dr. Sanna Järvelä, Prof. Dr. Timothy McKay and Assoc. Prof. Dr. Sidney D’Mello as keynote speakers, 36 full paper presentation, 28 short paper presentations, 45 posters and 16 workshops.

In our scientific program, we uphold the tradition of having a broad focus on the topic Learning Analytics. This year the program has grouped the papers into sessions according to the objective of the study, instead of the methodologies or technologies used in the papers. The scientific program reflects the diversity of our field with numerous sessions on different topics to stimulate lively discussions. Understanding student behaviour and their discourse during the learning process are still main concerns for the field. Other objectives, such as the application of Learning Analytics to measure and understand Self-Regulated Learning and Affective Learning are well represented. It is also important to note that the use of multimodal sources of learning traces are becoming part of many studies, leaving behind the exclusive focus on click-stream data.

Research about Learning Analytics has quickly matured as evidenced in the steadily increasing number of submissions to the 2017 conference. This year, a total of 114 full papers, 81 short papers and 67 posters were submitted. The acceptance rate was 32% for full papers and 35% for short papers, keeping with the quality standards from previous years.

Finally, we want to thank the 145 members of the Program Committee for their thoughtful and helpful reviews. Their work was not easy given the diversity and high quality of the works under review. Only with their support we were able to provide you with the selected program for LAK’17.

We sincerely hope that you enjoy the conference and that the ideas discussed during LAK’17 will be the seeds for new research to understand and improve learning.

Inge Molenaar
Radboud University Nijmegen,
The Netherlands

Xavier Ochoa
Escuela Superior Politécnica
del Litoral, Ecuador

Shane Dawson
University of South Australia,
Australia
LAK 2017 Conference Organization

General Conference Chairs
Alyssa Wise, New York University, USA
Phil Winne, Simon Fraser University, Canada
Grace Lynch, Society for Learning Analytics Research

Program Chairs - Research Track
Xavier Ochoa, Escuela Superior Politecnica del Litoral, Ecuador
Inge Molenaar, Radboud University, The Netherlands
Shane Dawson, University of South Australia, Australia

Program Chairs - Practitioner Track
Shady Shehata, Desire2Learn, Canada
Jennifer Pei-Ling Tan, National Institute of Education, Singapore

Proceedings Chair
Marek Hatala, Simon Fraser University, Canada

Workshop and Tutorial Chairs
Kirsty Kitto, Queensland University of Technology, Australia
Simon Knight, University of Technology Sydney, Australia

Demonstrations and Poster Chairs
Leah P. Macfadyen, University of British Columbia, Canada
Nia Dowell, University of Memphis, USA

Doctoral Consortium Chairs
Rebecca Ferguson, The Open University, United Kingdom
Bodong Chen, University of Minnesota, USA
Ani Aghababyan, McGraw Hill Education, USA
Joris Klerkx, Katholieke Universiteit Leuven, Belgium

Publicity and Social Media Chairs
Doug Clow, The Open University, United Kingdom
Roberto Martinez-Maldonado, University of Technology Sydney, Australia
LAK’17 Program Committee

Research Track

Giora Alexandron, Massachusetts Institute of Technology, USA
Ricardo Araujo, Universidade Federal de Pelotas, Brazil
Kimberly Arnold, University of Wisconsin Madison, USA
Ebrahim Bagheri, Ryerson University, Canada
Ryan Baker, Teachers College, Columbia University
Anesha Bakharia, Queensland University of Technology, Australia
Mehdi Bashari, University of New Brunswick, Canada
Marie Bienkowski, SRI International, USA
Mary Jean Blink, TutorGen, Inc., USA
Amel Bouzeghoub, Télécom SudParis, France
Christopher Brooks, University of Michigan, USA
Peter Brusilovsky, University of Pittsburgh, USA
Simon Buckingham Shum, University of Technology Sydney, Australia
Sandro Camargo, UNIPAMPA – Universidade Federal do Pampa, Brazil
Ted Carmichael, University of North Carolina at Charlotte, USA
Cristian Cechinel, UFPel – Federal University of Pelotas, Brazil
Karina Cela, Escuela Politécnica del Ejército, Ecuador
Irene-Angelica Chounta, Collide, University of Duisburg-Essen, Germany
Cassandra Colvin, University of South Australia, Australia
Lisa Corrin, University of Melbourne, Australia
Ben Daniel, University of Otago, New Zealand
Mihai Dascalu, University Politehnica of Bucharest, Romania
Shane Dawson, University of South Australia, Australia
Michel Desmarais, Ecole Polytechnique de Montreal, Canada
Stefan Dietze, L3S Research Center, Germany
Pierre Dillenbourg, École Polytechnique Fédérale de Lausanne, Switzerland
Yannis Dimitriadis, University of Valladolid, Spain
Hendrik Drachsler, Open University of the Netherlands, The Netherlands
Gregory Dyke, Université de Lyon, France
Hossein Fani, Ryerson University, Canada
Rebecca Ferguson, The Open University, United Kingdom
Alda Gancarski, Télécom SudParis, France
Serge Garelly, Telecom Bretagne, France
Dragan Gasevic, University of Edinburgh, United Kingdom
Isabela Gasparini, Universidade do Estado de Santa Catarina, Brazil
David Gibson, Curtin University, Australia
Janice Gobert, Rutgers University, USA
Art Graesser, University of Memphis, USA
Sabine Graf, Athabasca University, Canada
Wolfgang Grelle, Vienna University of Education, Austria
Anatoliy Gruzd, Ryerson University, Canada
Marek Hatala, Simon Fraser University, Canada
Caroline Haythornthwaite, University of British Columbia, Canada
Nial Heffernan, Worcester Polytechnic Institute, USA
Eelco Herder, L3S Research Center, Germany
Ulrich Hoppe, University Duisburg-Essen, Germany
Hazra Imran, Athabasca University, Canada
Jelena Jovanovic, University of Belgrade, Serbia
Charalampos Karagiannidis, University of Thessaly, Greece
Pythagoras Karampiperis, National Centre of Scientific Research “Demokritos”, Greece
Judy Kay, University of Sydney, Australia
Gregor Kennedy, University of Melbourne, Australia
Paul Kirschner, Open University of the Netherlands, The Netherlands
Kirsty Kitto, Queensland University of Technology, Australia
Ralf Klamma, RWTH Aachen University, Germany
Joris Klerkx, Katholieke Universiteit Leuven, Belgium
Simon Knight, University of Technology Sydney, Australia
Jeremy Knox, University of Edinburgh, United Kingdom
Charles Lang, New York University, USA
Eitel Lauria, Marist College, USA
Elise Lavoué, Jean Moulin University Lyon 3, France
Tobias Ley, Tallinn University, Estonia
Lori Lockyer, Macquarie University, Australia
Jason Lodge, University of Melbourne, Australia
Phillip Long, University of Texas at Austin, USA
Steven Lonn, University of Michigan, USA
Vanda Luengo, Joseph Fourier University, France
Grace Lynch, SoLAR, Canada
Leah Macfadyen, University of British Columbia, Canada
Katherine Maillet, Telecom Business School, France
Alejandra Martínez, University of Valladolid, Spain
Roberto Martínez-Maldonado, University of Technology Sydney, Australia
Riccardo Mazza, University of Lugano, Switzerland
Gordon McCalla, University of Saskatchewan, Canada
Agathe Merceron, Beuth University of Applied Sciences Berlin, Germany
Negin Mirriahi, University of New South Wales, Australia
Mukesh Mohania, IBM India Research Lab, India
Erik Moody, Marist College, USA
Pedro J. Muñoz Merino, Carlos III University of Madrid, Spain
Katja Niemann, Fraunhofer Society, Germany
Xavier Ochoa, Escuela Superior Politécnica del Litoral, Ecuador
Jaclyn Ocumpaugh, Columbia University, USA
Luc Paquette, Columbia University, USA
Abelardo Pardo, The University of Sydney, Australia
Zach Pardos, UC Berkeley, USA
Mykola Pechenizkiy, Eindhoven University of Technology, The Netherlands
Carolyn Penstein Rose, Open University of the Netherlands, The Netherlands
Niels Pinkwart, Humboldt-Universität zu Berlin, Germany
Enayat Rajabi, Dalhousie University, Canada
Christoph Rensing, Technische Universität Darmstadt, Germany
Bart Rientes, The Open University, United Kingdom
Tim Rogers, University of South Australia, Australia
Cristobal Romero, Pierre and Marie Curie University, France
Maren Scheffel, Open University of the Netherlands, The Netherlands
Andreas Schmidt, Karlsruhe University of Applied Sciences, Germany
Stylianos Sergis, University of Piraeus, Greece
Mike Sharkey, Blue Canary, USA
Bruce Sherin, Northwestern University, USA
Miguel-Angel Sicilia, University of Alcala, Spain
Marcus Specht, Open University of the Netherlands, The Netherlands
John Stamper, Carnegie Mellon University, USA
Karen Swan, University of Illinois Springfield, USA
Jennifer Pei-Ling Tan, National Institute of Education Singapore, Singapore
Stephanie Teasley, University of Michigan, USA
Stefan Trausan-Matu, University Politehnica of Bucharest, Romania
Denise Whitelock, The Open University, United Kingdom
Phil Winne, Simon Fraser University, Canada
Alyssa Wise, New York University, USA
Marcelo Worsley, Stanford University, USA
Kalina Yacef, The University of Sydney, Australia
Panagiotis Zervas, University of Piraeus, Greece
Amal Zouaq, University of Ottawa, Canada
# Table of Contents

**LA Infrastructure**  
Developing a MOOC experimentation platform: Insights from a user study  
*Vitomir Kovanovic, Srecko Joksimovic, Philip Katerinopoulos, Charalampos Michail, George Siemens, Dragan Gasevic*  
1-5

**Students at-Risk - Studies**  
Ouroboros: Early identification of at-risk students without models based on legacy data  
*Martin Hlosta, Zdenek Zdrahal, Jaroslav Zendulka*  
6-15  
Impact of Student Choice of Content Adoption Delay on Course Outcomes  
*Lalitha Agnihotri, Alfred Essa, Ryan Baker*  
16-20

**Modelling Student Behaviour**  
Detecting Changes in Student Behavior from Clickstream Data  
*Jihyun Park, Kameryn Denaro, Fernando Rodriguez, Padhraic Smyth, Mark Warschauer*  
21-30  
Modeling Exploration Strategies to Predict Student Performance within a Learning Environment and Beyond  
*Tanja Käser, Nicole R. Hallinen, Daniel L. Schwartz*  
31-40  
Opportunities for Personalization in Modeling Students as Bayesian Learners  
*Charles Lang*  
41-45

**Learning Analytics Ethics**  
An elephant in the learning analytics room – the obligation to act  
*Paul Prinsloo, Sharon Slade*  
46-55  
Where is the evidence? Learning analytics: a call to action  
*Rebecca Ferguson, Doug Clow*  
56-65  
Student Perceptions of Their Privacy in Learning Analytics Applications  
*Kimberly Arnold, Niall Sclater*  
66-69

**Understanding Student Behaviour - Multimodal Analytics**  
Understanding Student Learning Trajectories Using Multimodal Learning Analytics within an Embodied-Interaction Learning Environment  
*Alejandro Andrade*  
70-79  
Put Your Thinking Cap On: Detecting Cognitive Load using EEG during Learning  
*Caitlin Mills, Igor Fridman, Walid Soussou, Disha Waghray, Andrew Olney, Sidney D'Mello*  
80-89  
Analytics Meet Patient Manikins: Challenges in an Authentic Small-Group Healthcare Simulation Classroom  
*Roberto Martinez-Maldonado, Tamara Power, Carolyn Hayes, Adrian Abdipranoto, Tony Vo, Carmen Axisa, Simon Buckingham Shum*  
90-94

**Improving Learning**  
How to Assign Students into Sections to Raise Learning  
*Ming Chiu, Bonnie Chow, Sung Wook Joh*  
95-104  
Improving Learning through Achievement Priming in Crowdsourced Information Finding Microtasks  
*Ujwal Gadiraju, Stefan Dietze*  
105-114  
Exploring the Asymmetry of Metacognition  
*Ani Aghababyan, Nicholas Lewkow, Ryan Baker*  
115-119

**Understanding Discourse I**  
Temporal Analytics with Discourse Analysis: Tracing Ideas and Impact on Communal Discourse  
*Alwyn Vwen Yen Lee, Seng Chee Tan*  
120-127  
Dynamics of MOOC Discussion Forums  
*Mina Shirvani Boroujeni, Tobias Hecking, H. Ulrich Hoppe, Pierre Dillenbourg*  
128-137  
Assessment of Language in Authentic Science Inquiry Reveals Putative Differences in Epistemology
Melanie Peffer, Kristopher Kyle

Understanding Student Behaviour - Engagement
Predicting the decrease of engagement indicators in a MOOC
   Miguel L. Bote-Lorenzo, Eduardo Gómez-Sánchez
   Studying Engagement and Performance with Learning Technology in an African Classroom
   Komminist Weldemariam, Juliet Mutahi, Andrew Kinai, Abdigani Diriye, Nelson Bore

Reflective Writing
Reflective Writing Analytics for Actionable Feedback
   Andrew Gibson, Adam Atiken, Agnes Sándor, Simon Buckingham Shum, Cerie Tsingos-Lucas,
   Simon Knight
Reflective Writing Analytics - Empirically Determined Keywords of Written Reflection
   Thomas Daniel Ullmann

Learning Design
Unravelling the dynamics of instructional practice: A longitudinal study on learning design and VLE activities
   Quan Nguyen, Bart Rienties, Lisette Toetenel
A randomized controlled trial comparing three different ways of sequencing content: The role of choice
   Seth A. Adjei, Anthony F. Botelho, Neil T. Heffernan
ATCE - An Analytics Tool to Trace the Creation and Evaluation of Inclusive and Accessible Open
   Educational Resources
   Cecilia Avila Garzon, Silvia Margarita Baldiris Navarro, Ramon Fabregat, Sabine Graf

Self-Regulated Learning
Learning Pulse: a machine learning approach for predicting performance in self-regulated learning using multimodal data
   Daniele Di Mitri, Maren Scheffel, Hendrik Drachsler, Dirk Börner, Stefaan Ternier,
   Marcus Specht
Transitioning self-regulated learning profiles in hypermedia-learning environments
   Clarissa Lau, Jeanne Sinclair, Michelle Taub, Roger Azevedo, Eunice Eunhee Jang
Expanding the Scope of Learning Analytics Data: Preliminary Findings on Attention and Self-Regulation Using Wearable Technology
   Catherine Spann, James Schaeffer, George Siemens

Understanding Discourse II
How Effective is Your Facilitation? Group-Level Analytics of MOOC Forums
   Oleksandra Poquet, Shane Dawson, Nia Dowell
Words Matter: Automatic Detection of Questions in Classroom Discourse using Linguistics, Paralinguistics, and Context
   Patrick J Donnelly, Nathaniel Blanchard, Andrew M Olney, Sean Kelly, Martin Nystrand,
   Sidney K D'Mello
Towards Mining Sequences and Dispersion of Rhetorical Moves in Student Written Texts
   Simon Knight, Roberto Martinez-Maldonado, Andrew Gibson, Simon Buckingham Shum

Learning Analytics Policies
Learning Analytics in Higher Education – Challenges and Policies: A Review of Eight Learning Analytics Policies
   Yi-Shan Tsai, Dragan Gasevic
The Influence of Data Protection and Privacy Frameworks on the Design of Learning Analytics Systems
   Tore Hoel, David Griffiths, Weiqin Chen
An Information Policy Perspective on Learning Analytics
   Caroline Haythornthwaite

Teacher Support Tools I
Intelligent Tutors as Teachers’ Aides: Exploring Teacher Needs for Real-time Analytics in Blended Classrooms
Kenneth Holstein, Bruce M. McLaren, Vincent Aleven
Implementing Predictive Learning Analytics on a Large Scale: The Teacher's Perspective
Christothea Herodotou, Bart Rienties, Avinash Boroowa, Zdenek Zdrahal, Martin Hlosta, Galina Naydenova

Teacher Support Tools II
An Instructor Dashboard for Real-Time Analytics in Interactive Programming Assignments
Nicholas Diana, Michael Eagle, John Stamper, Shuchi Grover, Marie Bienkowski, Satabdi Basu
Real-time Learning Analytics for C Programming Language Courses
Xinyu Fu, Atsushi Shimada, Yuta Taniguchi, Daiki Suehiro, Hiroaki Ogata

Student Support Tools
Widget, widget as you lead, I am performing well indeed! - Using results from a formative offline study to inform an empirical online study about a learning analytics widget in a collaborative learning environment
Maren Scheffel, Hendrik Drachsler, Karel Kreijns, Joop de Kraker, Marcus Specht
Building a Transcript of the Future
Benjamin Koester, James Fogel, William Murdock, Galina Grom, Timothy McKay

Feedback Systems
Trends and Issues in Student-Facing Learning Analytics Reporting Systems Research
Robert Bodily, Katrien Verbert
Uncovering Reviewing and Reflecting Behaviors From Paper-based Formal Assessment
Sharon Hsiao, Po-Kai Huang, Hannah Murphy

Skill Assessment
Scientific Modeling: Using learning analytics to examine student practices and classroom variation
David Quigley, Jonathan Ostwald, Tamara Sumner
Predicting Math Performance Using Natural Language Processing Tools
Scott Crossley, Ran Liu, Danielle McNamara

Understanding Student Behaviour – General
Learning Analytics in a Seamless Learning Environment
Kousuke Mouri, Hiroaki Ogata, Noriko Uosaki
SPACLE: Investigating learning across virtual and physical spaces using spatial replays
Kenneth Holstein, Bruce M. McLaren, Vincent Aleven

Learning Analytics Adoption – Recommendations
What do students want? Towards an instrument for students’ evaluation of quality of learning analytics services
Alexander Whitelock-Wainwright, Dragan Gasevic

Understanding Discourse III
What’d You Say Again? Recurrence Quantification Analysis as a Method for Analyzing the Dynamics of Discourse in a Reading Strategy Tutor
Laura Allen, Cecile Perret, Aaron Likens, Danielle McNamara
Honing in on Social Learning Networks in MOOC Forums: Examining Critical Network Definition Decisions
Alyssa Friend Wise, Yi Cui, Wan Qi Jin
Using Correlational Topic Modeling for Automated Topic Identification in Intelligent Tutoring Systems
Stefan Slater, Ryan Baker, Ma. Victoria Almeda, Alex Bowers, Neil Heffernan

Adaptive Learning
Enhancing Learning Through Virtual Reality and Neurofeedback: A First Step
Ryan Hubbard, Aldis Sipolins, Lin Zhou
Strategy for recommendation based on legacy VLE activity
Michal Huptych, Michal Bohuslavek, Martin Hlosta, Zdenek Zdrahal
Understanding Student Behaviour – Help-Seeking / Search
Supporting collaborative learning with tag recommendations: a real-world study in an inquiry-based classroom project
Simone Kopeinik, Elisabeth Lex, Paul Seitlinger, Dietrich Albert, Tobias Ley 409-418
Classifying Help Seeking Behaviour in Online Communities
Sebastian Cross, Zak Waters, Kirsty Kitto, Guido Zuccon 419-423
Using learning analytics to explore help-seeking learner profiles in MOOCs
Linda Corrin, Paula G. de Barba, Aneesha Bakharia 424-428

Affective Learning
EMODA: a Tutor Oriented Multimodal and Contextual Emotional Dashboard
Mohamed Ez Zaouia, Elise Lavoué 429-438
Person-Centered Approach to Explore Learner’s Emotionality in Learning within a 3D Narrative Game
Zhenhua Xu, Earl Woodruff 439-443
Roger Azevedo, Garrett Millar, Michelle Taub, Nicholas Mudrick, Amanda Bradbury, Megan Price 444-448

LA Adoption - Experiences
Strategies for Data and Learning Analytics Informed National Education Policies: The Case of Uruguay
Cecilia Aguerrebere, Cristóbal Cobo, Marcela Gomez, Matías Mateu 449-453

Retention
Follow the Successful Crowd: Raising MOOC Completion Rates through Social Comparison at Scale
Dan Davis, Ioana Jivet, René Kizilcec, Guanliang Chen, Claudia Hauff, Geert-Jan Houben 454-463
Planning Prompts Increase and Forecast Course Completion in Massive Open Online Courses
Michael Yeomans, Justin Reich 464-473
From prediction to impact: Evaluation of a learning analytics retention program
Shane Dawson, Jelena Jovanovic, Dragan Gasevic, Abelardo Pardo 474-478

Students at-Risk - Systems
Guidance Counselor Reports of the Assistments College Prediction Model (ACPM)
Jaclyn Ocumpaugh, Ryan Baker, Stefan Slater, Maria Ofelia San Pedro, Neil Heffernan, Cristina Heffernan, Aaron Hawn 479-488
Don't Call it a Comeback: Academic recovery and the timing of educational technology adoption
Michael Brown, Matt Demonbrun, Stephanie Teasley 489-493

Workshops
LA Policy: Developing an Institutional Policy for Learning Analytics using the RAPID Outcome Mapping Approach
Yi-Shan Tsai, Dragan Gasevic, Pedro Munoz-Merino 494-495
Writing Analytics Literacy – Bridging from Research to Practice
Simon Knight, Laura Allen, Andrew Gibson, Danielle McNamara, Simon Buckingham Shum 496-497
Developing Institutional Learning Analytics - Communities of Transformation - to Support Student Success
Leah Macfadyen, Dennis Groth, George Rehrey, Linda Shepard, Jim Greer, Doug Ward, Caroline Bennett, Jake Kaupp, Marco Molinaro, Matt Steinwachs 498-499
First Annual Workshop of the Methodology in Learning Analytics Bloc (MethLAB)
Yoav Bergner, Charles Lang, Geraldine Gray 500-501
Quasi-Experimental Design for Causal Inference Using Python and Apache Spark: A Hands-on Tutorial
Shirin Ameiryan Mojarad, Nicholas Lewkow, Alfred Essa, Jie Zhang 502-503
Beyond Failure: The 2nd LAK Failathon
Doug Clow, Rebecca Ferguson, Kirsty Kitto, Yong-Sang Cho, Mike Sharkey, Cecilia Aguerrebere 504-505
Workshop on Integrated Learning Analytics of MOOC Post-Course Development

Elle Yuan Wang, Dan Davis, Guanliang Chen, Luc Paquette

DesignLAK17: Quality metrics and indicators for analytics of assessment design at scale

Sandra Milligan, Ulla Ringtved, Linda Corrin, Nancy Law, Allison Littlejohn

2nd Cross-LAK: Learning Analytics Across Physical and Digital Spaces

Roberto Martinez-Maldonado, Davinia Hernandez-Leo, Abelardo Pardo, Hiroaki Ogata

FutureLearn data: what we currently have, what we are learning and how it is demonstrating learning in MOOCs

Lorenzo Vigentini, Manuel Leon Urrutia, Ben Fields

LAK17 Hackathon - Getting the right information to the right people so they can take the right action

Adam Cooper, Alan Berg, Niall Sclater, Tanya Dorey-Elias, Kirsty Kitto

Learning Analytics and Policy (LAP): international aspirations, achievements and constraints

Megan Bowe, Weiqin Chen, Dai Griffiths, Tore Hoel, Jaeho Lee, Hiroioaki Ogata, Griff Richards, Li Yuan, Jingjing Zhang

Current and Future Multimodal Learning Analytics Data Challenges

Daniel Spikol, Emanuele Ruffaldi, Mutlu Cukurova, Xavier Ochoa, Luis P. Prieto, Marcelo Worsley, Maria Jesus Rodriguez-Triana, Ulla Lunde Ringtved, Bahitijar Vogel

Building the Learning Analytics Curriculum

Charles Lang, Stephanie Teasley, John Stamper

Connecting Data with Student Support Actions in a Course: A Hands-on Tutorial

Abelardo Pardo, Roberto Martinez-Maldonado, Simon Buckingham Shum, Simon McIntyre, Dragan Gasevic, Jing Gao, Jurgen Schulte, George Siemens

Community Based Educational Data Repositories and Analysis Tools

Kenneth Koedinger, Ran Liu, John Stamper, Candace Thille, Philip I. Pavlik Jr.

Posters

Student Empowerment, Awareness, and Self-Regulation through a Quantified-Self Student Tool

Kimberly Arnold, Brandon Karcher, Casey Wright, James McKay

A Systematic Review of Studies on Predicting Student Learning Outcomes Using Learning Analytics

Xiao Hu, Christy W.L. Cheong, Wenwen Ding, Michelle Woo

A Framework for Hypothesis-Driven Approaches to Support Data-Driven Learning Analytics in Measuring Computational Thinking In Block-Based Programming

Shuchi Grover, Marie Bienkowski, Satabdi Basu, Michael Eagle, Nicholas Diana, John Stamper

Dear Learner: Participatory Visualisation of Learning Data for Sensemaking

Simon Knight, Theresa Anderson, Kelly Tall

Video Annotation Tool for Learning Job Interview

Yoshitomo Yaginuma, Masako Furukawa, Tsuneo Yamada

Reproducibility of Findings from Educational Big Data: A Preliminary Study

Misato Oi, Masanori Yamada, Fumiya Okubo, Atsushi Shimada, Hiroaki Ogata

Large Scale Predictive Process Mining and Analytics of University Degree Courses

Jurgen Schulte, Pedro Fernandez de Mendonca, Roberto Martinez-Maldonado, Simon Buckingham Shum

Beyond Failure: The 2nd LAK Failathon Poster

Doug Clow, Rebecca Ferguson, Kirsty Kitto, Yong-Sang Cho, Mike Sharkey, Cecilia Aguerrebere

Examining Motivations and Self-regulated Learning Strategies of Returning MOOCs Learners

Bodong Chen, Yizhou Fan, Guogang Zhang, Qiong Wang

Learning from Learning Curves: Discovery of Interpretable Learning Trajectory Groups

Lujie Chen, Artur Dubrawski

Utilizing Visualization and Feature Selection Methods to Identify Important Learning Objectives in a Course

Farshid Marbouti, Heidi Diefes-Dux, Krishna Madhavan

How can we accelerate dissemination of knowledge and learning?: Developing an online knowledge management platform for Networked Improvement Communities

Ouajdi Manai, Hiroyuki Yamada

xii
Students’ Emotional Self-Labels for Personalized Models
Sinem Aslan, Eda Okur, Nese Alyuz, Sinem Emine Mete, Ece Oktay, Utku Genc, Ashli Arslsan Esme
550-551

Write-and-Learn: Promoting Meaningful Learning through Concept Map-Based Formative Feedback on Writing Assignments
Ye Xiong, Yi-Fang Brook Wu
552-553

Data-Assisted Instructional Video Revision via Course-Level Exploratory Video Retention Analysis
Chi-Un Lei, Donn Gonda, Xiangyu Hou, Elizabeth Oh, Xinyu Qi, Tyrone T.O. Kwok, Yip-Chun Au Yeung, Ray Lau
554-555

Using predictive analytics in a self-regulated learning university course to promote student success
Rebecca Edwards, Sarah Davis, Dr. Alyson Hadwin, Dr. Todd Milford
556-557

What Are Visitors Up To? Helping Museum Facilitators Know What Visitors are Doing
Vishesh Kumar, Mike Tissenbaum, Matthew Berland
558-559

Predicting e-Textbook Adoption Based on Event Segmentation of Teachers’ Usage
Longwei Zheng, Wei Gong, Xiaqing Gu
560-561

Business Intelligence (BI) for Personalized Student Dashboards
Jody Sluijter, Marloes Otten
562-563

When Learning is High Stake
Cecilie Johanne Slokvik Hansen, Barbara Wasson, Hans Skretting, Grete Netteland, Marina Hirstein
564-565

Mining Knowledge Components from Many Untagged Questions
Neil Zimmerman, Ryan Baker
566-567

Relevance of Learning Analytics to Measure and Support Students’ Learning in Adaptive Educational Technologies
Maria Bannert, Inge Molenaar, Roger Azevedo, Sanna Ji_reveli_, Dragan Gasevic
568-569

Exploring the Measurement of Collaborative Problem Solving Using a Human-Agent Educational Game
Kristin Stoeffler, Yigal Rosen, Alina von Davier, Amit Agrawal
570-571

Cooking with Learning Analytics Recipes
Roope Jaakonmaki, Stefan Dietze, Hendrik Drachsler, Albrecht Fortenbacher, Michael Kickmeier-Rust, Ivana Marenzi
572-573

Using Item Response Theory to Generate an Item Pool for an E-Learning-System
Markus Schweighart
574-575

Forecasting Student Outcomes at University-Wide Scale Using Machine Learning
Drew Wham
576-577

Buying Time: Enabling Learners to become Earners with a Real-World Paid Task Recommender System
Guanliang Chen, Daniel Davis, Markus Krause, Claudia Hauff, Geert-Jan Houben
578-579

Discourse Analysis to Improve the Effective Engagement of MOOC Videos
Thushari Atapattu, Katrina Falkner
580-581

Understanding the relationship between technology use and cognitive presence in MOOCs
Vitomir Kovanovic, Srecko Joksimovic, Oleksandra Poquet, Thieme Hennis, Shane Dawson, Dragan Gasevic, Pieter de Vries, Marek Hatala, George Siemens
582-583

Supporting Learning Analytics in Computing Education
Daniel Olivares, Christopher Hundhausen
584-585

Integrating Syllabus Data into Student Success Models
Josh Gardner, Ogechi Onuoha, Christopher Brooks
586-587

Tracing physical movement during practice-based learning through Multimodal Learning Analytics
Donal Healion, Sam Russell, Mutlu Cukurova, Daniel Spikol
588-589

Automating Student Survey Reports in Online Education for Faculty and Instructional Designers
Sean Burns, Kimberley Corwin
590-591

Learning Analytics for Sensor-Based Adaptive Learning
Albrecht Fortenbacher, Niels Pinkwart, Haeseon Yun
592-593

What does student writing tell us about their thinking on social justice?
Heeryung Choi, Christopher Brooks, Kevyn Collins-Thompson
594-595

MORPH: Supporting the Integration of Learning Analytics at Institutional Level
Zoran Jeremic, Vive Kumar, Sabine Graf
596-597

A Neural Network Approach for Students’ Performance Prediction
xiii
Challenges and Opportunities Facing Educational Discourse Researchers
Christopher Brooks, Stephanie Teasley, George Siemens
Using Learning Analytics in Iterative Design of a Digital Modeling Tool
David Quigley, Conor McNamara, Tamara Sumner
An Outcome-based Dashboard for Moodle and Open EdX
Xiao Hu, Xiangyu Hou, Chi-Un Lei, Chengrui Yang, Tzi Dong Jeremy Ng
Automated Analysis of Aspects of Written Argumentation
Noureddine Elouazizi, Gí lnur Birol, Eric Jandciu, Gunilla Oberg, Ashley Welsh, Andrea Han, Alice Campbell
An Automatic Approach for Discovering Skill Relationship from Learning Data
Tak-Lam Wong, Haoran Xie, Fu Lee Wang, Chung Keung Poon, Di Zou
Topic Models to Support Instructors in MOOC Forums
Jovita Vytasek, Alyssa Wise, Sonya Woloshen
Best Intentions: Learner Feedback on Learning Analytics Visualization Design
Halimat Alabi, Marek Hatala
The effects of a learning analytics empowered technology on the students’ arithmetic skills learning
Inge Molenaar, Carolien Knoop-Van Campen, Fred Hasselman
New Features in Wikiglass, A Learning Analytic Tool for Visualizing Collaborative Work on Wikis
Xiao Hu, Chengrui Yang, Chen Qiao, Xiaoyu Lu, Samuel Chu