

# 2<sup>nd</sup> Cross-LAK: Learning Analytics Across Physical and Digital Spaces

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## 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/or 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.

## CCS Concepts

• Information systems → Information systems applications → Collaborative and social computing systems and tools

## 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

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LAK '17, March 13-17, 2017, Vancouver, BC, Canada  
ACM 978-1-4503-4870-6/17/03.

<http://dx.doi.org/10.1145/3027385.3029432>

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.

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