

Preface of the Doctoral Consortium of the Learning Analytics Summer Institute Europe 2024 (LASI Europe 2024 DC) *

Yannis Dimitriadis¹, Rebeca Cerezo², Antonio Balderas³, Alejandra Martínez-Monés¹ and Daniel Spikol⁴

¹Universidad de Valladolid, GSIC/EMIC Research Group, Valladolid, Spain

²Universidad de Oviedo, Department of Psychology, Oviedo, Spain

³Universidad de Cádiz, Department of Computer Engineering, Puerto Real, Spain

⁴University of Copenhagen, Department of Computer Science, Copenhagen, Denmark

1. Introduction

The first Learning Analytics Summer Institute Europe 2024 (LASI Europe 2024) took place in Jerez de la Frontera, Spain, co-organised by the Spanish Network for Learning Analytics (SNOLA) and the SOLAR LACE SIG (the Learning Analytics Community Europe – Special Interest Group of the Society for Learning Analytics Research), and hosted by the University of Cádiz (UCA). Building on previous editions of LASI Spain [1, 2, 3, 4, 5, 6, 7] and Nordic LASI [8], this event is part of the global LASI network (<https://www.solaresearch.org/events/lasi/>), designed as a platform to bring together researchers across Europe to shape the next generation of learning infrastructures that truly address the evolving needs of the education sector. With the theme “Facilitating Adoption of Learning Analytics in the European Context”, LASI Europe 2024 aimed to foster engaging discussions on the latest advancements and challenges in learning analytics, particularly within the European context.

One of the key highlights was the LASI Europe 2024 Doctoral Consortium, which provided an invaluable platform for PhD students in Learning Analytics across Europe to present and discuss their research. This collaborative and constructive environment allowed the students to receive insightful feedback from leading experts in the field. Eleven papers were presented for the Doctoral Consortium, and nine were selected for inclusion in the proceedings.


LASI Europe 2024 DC: Doctoral Consortium of the Learning Analytics Summer Institute Europe 2024, May 29-31 2024, Jerez de la Frontera, Spain

✉ yannis@tel.uva.es (Y. Dimitriadis); cerezorebeca@uniovi.es (R. Cerezo); antonio.balderas@uca.es (A. Balderas); amartine@infor.uva.es (A. Martínez-Monés); ds@di.ku.dk (D. Spikol)

🆔 0000-0001-7275-2242 (Y. Dimitriadis); 0000-0002-2253-106X (R. Cerezo); 0000-0003-0026-7410 (A. Balderas); 0000-0003-3201-0345 (A. Martínez-Monés); 0000-0001-9454-0793 (D. Spikol)



© 2024 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

 CEUR Workshop Proceedings (CEUR-WS.org)

2. An Overview to LASI Europe 2024 Programme

In addition to the Doctoral Consortium, LASI Europe 2024 included two keynote addresses, two workshops, and two sessions for presenting research groups and projects and demonstrating tools in learning analytics.

2.1. Keynotes

The first keynote, “Looking to the Future” by Rebecca Ferguson, explored the predictions made a decade ago by Europe’s Learning Analytics Community Exchange (LACE) regarding the future of learning analytics [9]. Ferguson examined various scenarios, including the feasibility and desirability of widespread adoption of learning analytics, the control of learners over their own data, and the potential tracking by learning environments. She assessed the accuracy of these predictions and provided an overview of the current state of learning analytics in Europe, proposing priorities for future developments. This interactive keynote fostered deep discussions and reflections among participants about the challenges and opportunities facing the field.

The second keynote, “LA in light of the GDPR and the forthcoming AI Act” by Malgorzata Cyndecka, addressed the legal implications of learning analytics within the framework of the General Data Protection Regulation (GDPR) and the upcoming AI Act [10]. Cyndecka shared her expertise on data protection and discussed the challenges and opportunities associated with using AI in education. She highlighted the importance of trust and legal compliance in deploying learning analytics technologies.

2.2. Workshops

The LASI Europe 2024 programme included two engaging workshops that provided participants with hands-on experience and theoretical insights into key aspects of learning analytics. The first workshop, entitled “Design-Based Research Methodology: Going deeper than methods in multimodal learning analytics”, was led by Danielle Hagood. This workshop delved into the methodology underpinning design-based research methods and its application in multi-modal learning analytics (MMLA). The participants engaged in collaborative theoretical reflection and practical knowledge sharing, thereby positioning themselves as active collaborators in exploring the debates in theory, research summaries, and resources designed to clarify the methodology in MMLA.

The second workshop, entitled “Generating Overview of Influencing Factors in Contextual Implementation and Usage of Learning Analytics”, was conducted by Claudia Ruhland and Ummay U. Shegupta. It focused on capturing and analysing teachers’ perspectives on learning analytics through quantitative and qualitative surveys. The workshop aimed to identify the opportunities and challenges associated with learning analytics from a pedagogical standpoint, while considering broader political, economic, and technological influences. The participants collaborated to integrate these factors into a SWOT analysis, with the objective of identifying strategies to optimise the strengths and opportunities of learning analytics while addressing the identified challenges and risks. The outcomes of the workshop provided the participants with a structured overview of the factors influencing the effective implementation and usage of learning analytics.

2.3. Projects, groups and demos

In addition to the workshops, LASI Europe 2024 featured presentation sessions from research groups and projects in the field of Learning Analytics, with a total of eight presentations of each type. These sessions provided a platform for researchers to share their latest findings and fostered lively discussions on various topics within the field. There were also four tool demonstration sessions and round table discussions aimed at encouraging networking and potential collaborations. The sessions were ably chaired by Professors María Jesús Rodríguez Triana (University of Valladolid) and Ruth Cobos (Autonomous University of Madrid).

The tool demonstration sessions showcased innovative solutions in learning analytics. Andrea Vázquez-Ingelmo presented the *ENCORE platform*, a tool for personalised learning design based on Open Educational Resources (OERs), offering initial insights into component formats within the context of teaching about model-driven engineering [11]. Miguel Ángel Conde-González demonstrated a learning analytics tool designed for analysing students' Telegram messages in the context of virtual teamwork activities [12]. Sven Judel presented *EXCALIBUR LA*, an extendable and scalable ecosystem for learning analytics [13]. Finally, Rasa Erentaitė presented a prototype tool for analysing disparities in school achievement from a person and variable-oriented perspective, using data from 17,685 Lithuanian students to reveal a slight normative decline in maths achievement during the Covid-19 pandemic [14].

2.4. Doctoral Consortium

The doctoral consortium allowed Ph.D. students to present the advances on their thesis projects.

2.4.1. Contributions Accepted in the Proceedings

The contributions accepted for inclusion in the proceedings are summarised below.

Enriched feedback of classroom dynamics using AI This doctoral thesis, presented by Federico Pardo García, investigates the interactions between students and teachers by analysing audio from classroom sessions through MMLA. The objective is to enhance professional development opportunities for teachers by leveraging features extracted from classroom audio recordings. The research aims to provide insights such as teaching profiles, interaction statistics, automatic classification, and speech analysis, through a software solution that processes audio recordings using state-of-the-art technologies.

Privacy of Sequential Data for Learning Analytics This research, presented by Anailys Hernández Julián, addresses the issue of collecting sequential data in a scalable manner, balancing privacy, accuracy, and utility. It employs sketching methods and differential privacy to achieve this. It highlights the risks of background knowledge and the exposure of sequential data to third parties, and focuses on anonymising data while maintaining its usefulness for learning analytics.

Learning Analytics Driven ARC-Tutoring for Individual Study Success This doctoral study, presented by Ummay Ubaida Shegupta, explores the concept of ARC tutoring guided by learning analytics to support study success in higher education. By employing learning analytics, the ARC tutoring workbench provides assessment, recommendation, and conversational agent features, offering students individualised support and enabling tutors to monitor group and individual performance.

Integrative Analysis of Multimodal Interaction Data: Predicting Communication Dynamics and Willingness to Communicate (WtC) in Human-Agent Interaction This research, presented by Aboul Hassane Cisse, examines the relationship between physiological and behavioural indicators and the willingness to communicate (WtC) in human-agent interactions. Using ANCOVA and SVM techniques, it analyses data from heart rate, eye movement, facial expressions, and conversational dynamics to predict and enhance WtC, with the aim of improving the design and effectiveness of conversational agents.

Mapping the Analysis of Students' Digital Footprint to Constructs of Learning This study, presented by Kamran Mir, explores the significance of learning theories in evaluating learning practices through multi-modal data collected from interactive technologies in higher education. It examines the impact of learning design on data curation and modelling, with the aim of developing more generalisable models of learning that can reliably optimise the learning context for students.

The Right to Privacy and Data Protection for High School Students in the Context of Digital Learning Models and Learning Analytics This research, presented by Mario Paludi, examines the legal and ethical implications of privacy and data protection for high school students in the context of digital learning and learning analytics. It assesses the preparedness of schools in managing student data, evaluates knowledge and attitudes towards data privacy, and proposes improvements for handling student data securely and ethically.

Knowing Together - Sharing Artefacts in Struggling Groups This doctoral project, presented by Liv Nøhr, investigates the relationship between artefacts, group compositions, and interactions in lab-based group work. The study employs sensors, video, and audio recordings to identify patterns of participation based on knowledge artefacts, with the objective of informing the development of a learning analytics system and enhancing understanding of artefact use in group interactions.

Serious game analytics applied to learning with games This research, presented by Julio Santilario Berthilier, advances the study of serious games in educational contexts by integrating a data-cycle based game learning analytics model using IEEE standards. The objective is to enable better non-intrusive user evaluation and stealth evaluation in serious games, thereby contributing to evidence-based serious gaming in authentic learning environments.

Understanding Learning in Culturally Relevant Artificial Intelligence Education This study, presented by Nora Patricia Hernández López, proposes methods for teaching young students about AI, with a particular focus on responsible use and cultural relevance. It investigates cognitive, affective, and behavioural learning outcomes through self-reports, observations, and system logs, with a specific interest in how local cultures influence AI education. The research aims to illuminate opportunities and challenges in teaching AI within different cultural contexts.

3. LASI Spain 2024 committees

The following subsections list the members of the committees responsible for organising LASI Europe 2024.

3.1. Organising Committee Chairs

- Alejandra Martínez Monés (University of Valladolid)
- Daniel Spikol, (University of Copenhagen)
- Antonio Balderas (University of Cádiz)

3.2. Organising Committee

- Ruth Cobos (Autonomous University of Madrid)
- Juan Manuel Dodero (University of Cádiz)
- María J. Rodríguez Triana (University of Valladolid)
- Andrea Vázquez Ingelmo (University of Salamanca)
- Olga Viberg (KTH Royal Institute of Technology)
- Barbara Wasson (SLATE / University of Bergen)
- José Miguel Mota (University of Cádiz)

3.3. Doctoral Consortium Chairs

- Yannis Dimitriadis (University of Valladolid)
- Rebeca Cerezo (University of Oviedo)

References

- [1] M. Caeiro-Rodríguez, Á. Hernández-García, P. J. Muñoz-Merino, S. Ros, Learning analytics summer institute spain 2017: Advances in learning analytics (preface by the editors), CEUR Workshop Proceedings 1925 (2017) 1–8. URL: <https://ceur-ws.org/Vol-1925/paper01.pdf>.
- [2] M. Á. Conde, C. Fernández-Llamas, F. J. Rodríguez-Sedano, Á. M. Guerrero-Higuera, Á. Hernández-García, F. J. García-Peñalvo, Learning analytics summer institute spain 2018: Preface by the editors, CEUR Workshop Proceedings 2188 (2018) 1–5. URL: <https://ceur-ws.org/Vol-2188/Paper1.pdf>.

- [3] M. Caeiro-Rodríguez, Á. Hernández-García, P. J. Muñoz-Merino, Learning analytics summer institute spain 2019: Learning analytics in higher education (preface by the editors), CEUR Workshop Proceedings 2415 (2019) 1–8. URL: <https://ceur-ws.org/Vol-2415/paper01.pdf>.
- [4] A. Martínez-Monés, A. Álvarez, M. Caeiro-Rodríguez, Y. Dimitriadis, Learning analytics summer institute spain 2020. learning analytics: Time for adoption? (preface by the editors), CEUR Workshop Proceedings 2671 (2020) 1–8. URL: <https://ceur-ws.org/Vol-2671/paper01.pdf>.
- [5] Á. Hernández-García, D. Hernández-Leo, M. Caeiro-Rodríguez, T. Sancho-Vinuesa, Learning analytics in times of covid-19: Opportunity from crisis (preface by the editors), CEUR Workshop Proceedings 3029 (2021). URL: <https://ceur-ws.org/Vol-3029/xpreface.pdf>.
- [6] A. Vázquez-Ingelmo, Y. Dimitriadis, A. Martínez-Monés, F. J. García-Peñalvo, Preface of the learning analytics summer institute spain 2022 (lasi spain 2022), CEUR Workshop Proceedings 3238 (2022). URL: <https://ceur-ws.org/Vol-3238/preface.pdf>.
- [7] A. Balderas, A. Martínez-Monés, J. M. Doderó, S. Ros, Preface of the learning analytics summer institute spain 2023 (lasi spain 2023), CEUR Workshop Proceedings 3542 (2023). URL: <https://ceur-ws.org/Vol-3542/xpreface.pdf>.
- [8] O. Viberg, R. Glassey, D. Spikol, O. Bälter, Nordic learning analytics (summer) institute 2021, CEUR Workshop Proceedings 2985 (2021). URL: <https://ceur-ws.org/Vol-2985/preface.pdf>.
- [9] R. Ferguson, A. Brasher, D. Clow, D. Griffiths, H. Drachsler, Learning analytics: Visions of the future, in: 6th International Learning Analytics and Knowledge (LAK) Conference, 2016. URL: <https://oro.open.ac.uk/45312/>.
- [10] M. Cyndecka, Ai in educational settings and data protection concerns, https://www.uib.no/sites/w3.uib.no/files/attachments/malgorzata_cyndecka.pdf, 2024. Policy briefs: New Challenges to Democracy, NORCE and University of Bergen.
- [11] A. Bucchiarone, A. Vázquez-Ingelmo, G. Schiavo, S. Barandoni, A. García-Holgado, F. J. García-Peñalvo, S. Mosser, A. Pierantonio, S. Zschaler, W. Barnett, Towards personalized learning paths to empower competence development in model driven engineering through the encore platform, in: 2023 ACM/IEEE International Conference on Model Driven Engineering Languages and Systems Companion (MODELS-C), IEEE, 2023, pp. 122–129.
- [12] M. Á. Conde, F. J. Rodríguez-Sedano, F. J. Rodríguez-Lera, A. Gutiérrez-Fernández, Á. M. Guerrero-Higueras, Assessing the individual acquisition of teamwork competence by exploring students' instant messaging tools use: the whatsapp case study, *Universal Access in the Information Society* 20 (2021) 441–450.
- [13] S. Judel, U. Schroeder, Excalibur la-an extendable and scalable infrastructure build for learning analytics, in: 2022 International conference on advanced learning technologies (ICALT), IEEE, 2022, pp. 155–157.
- [14] R. Erentaitė, R. Vosylis, B. Simonaitienė, E. Melnikė, D. Sevalneva, Uncovering heterogeneity in achievement during the covid-19 pandemic: Math grades trajectories and their predictors in middle school, *International Journal of Educational Research* 121 (2023) 102231.