LA4SLE workshop: Learning analytics for smart learning environments

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Preface to the Workshop Proceedings

The LA4SLE Workshop on Learning Analytics for Smart Learning Environments took place online due to the coronavirus outbreak. This workshop was a pre-conference event of the European Conference on Technology Enhanced Learning 2021 (EC-TEL 2021).

The workshop aimed at connecting the research areas of Smart Learning Environments (SLEs) and Learning Analytics (LA). On the one hand, SLEs provide learners with adequate support at the right time and place based on their needs, which are determined by analyzing their learning behaviors, performance, and contexts [1]. SLEs have the potential to support a myriad of learning scenarios that connect formal and informal learning, including many addressing the global challenges derived from the pursuit of a free, safe, and sustainable world. With this aim, SLEs may collect data about learners and educators' actions and interactions related to their participation in learning activities as well as about different aspects of the context in which they can be carried out from sources such as Learning Management Systems, handheld devices, computers, cameras, microphones, wearables, and environmental sensors. On the other hand, LA research deals with how data from learners and their context can be transformed and analyzed using different computational and visualization techniques to obtain actionable information [2] that can trigger a wide range of interventions aiming to promote better learning in both formal and informal contexts [4, 5].

The participants discussed the main issues to further research, development, and implementation of SLEs and how these overlap with LA. Additionally, how SLE research and practice can utilize the latest advances in LA. Contributions from the following topics were welcomed, among others:

- Identification of actionable indicators to trigger interventions in SLEs
- Multimodal Learning Analytics in SLEs
- Visualization techniques for end users in SLEs

- New learning scenarios supported by SLEs to address global challenges in the pursuit of a free, safe and sustainable world
- Design of LA that prevents and handles new risks brought by SLEs
- Evaluation of SLE using LAs
- Explainable LA for meaningful SLEs
- Analysis of user engagement in SLEs
- Interventions in SLEs based on LA
- Scalable and sustainable system design for SLEs
- Ethics and privacy in LA and SLEs

The workshop included a Call for Papers. Each of the submitted manuscripts was reviewed by at least three members of the Workshop Program Committee. The workshop organizers, as experts in both SLEs and LA, made the final decisions on acceptance. Feedback was especially focused on how the connection between SLEs and LA can be new research perspectives. A total of six papers were submitted and accepted to be published in this LA4SLE Workshop Proceedings after addressing the issues raised by reviewers.

Accepted papers were presented at the Workshop and served as starting point for the discussion of the main issues and opportunities at the confluence of Learning Analytics and Smart Learning Environments. In this discussion, workshop participants identified new IOT scenarios for SLEs, ethics-driven LA for SLEs, personalization of interventions, and more theoretically founded research for the design of more human centered SLEs as main issues to be addressed.

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Acknowledgements

This work was partially supported by the projects SmartLET, H2O and SNOLA by the Spanish Ministry of Science, Innovation and Universities (grant numbers TIN2017-85179-C3-1-R, TIN2017-85179-C3-2-R, TIN2017-85179-C3-3-R, PID2020-112584RB-C31, PID2020-112584RB-C32, PID2020-112584RB-C33, and RED2018-102725-T) funded by the Agencia Estatal de Investigación (AEI) and Fondo Europeo de Desarrollo Regional (FEDER). The work was also partially supported by the Madrid Regional Government through the e-Madrid-CM Project under Grant S2018/TCS-4307, a project which is co-funded by the European Structural Funds (FSE and FEDER). D. Hernández-Leo is a Serra Húnter fellow and acknowledges the support by ICREA under the ICREA Academia programme.

References

[1] Spector, J. M., “Conceptualizing the emerging field of Smart Learning Environments”, Smart Learning Environments, 1, 2, 2014. https://doi.org/10.1186/s40561-014-0002-7

[2] Long, P., & Siemens, G., “Penetrating the fog: Analytics in learning and education”, Educause Review, 46(5), pp. 31-40, September 2011.

[3] Papamitsiou Z., & Economides A., “Learning Analytics for Smart Learning Environments: A meta-analysis of empirical research results from 2009 to 2015”. In: Spector M., Lockee B., Childress M. (eds) Learning, Design, and Technology. Springer, Cham, 2016. https://doi.org/10.1007/978-3-319-17727-4_15-1

[4] Tabuenca, B., Serrano-Iglesias, S., Carruana-Martín, A., Villa-Torrano, C., Dimitriadis, Y., Asensio-Pérez, J.I., Alario-Hoyos, C., Gómez-Sánchez, E., Bote-Lorenzo, M.L., Martínez-Monés, A., Delgado-Kloos, C., “Affordances and core functions of Smart Learning Environments: A systematic literature review”. IEEE Transactions on Learning Technologies, 14(2), pp. 129-145, April 2021. . https://doi.org/10.1109/TLT.2021.3067946