

Introduction to the Minitrack on Learning Analytics 2023

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The digitalization of society cuts through the entire education system (e.g. Deeva, Bogdanova, et al., 2021; Flores et al., 2022; Josefsson & Willermark, 2022; Olofsson et al., 2021; Pareto & Willermark, 2014, 2022; Willermark & Islind, 2022a, 2022b; Winman et al., 2018). It is therefore not surprising that learning analytics and educational data mining have arisen as important research fields in the last decades to enhance education at all levels (Deeva, Willermark, et al., 2021; Willermark et al., 2022).

Learning analytics (LA) centers around aspects of personalization, adaptive learning, predictive analysis, and user behavior profiling. Often, learning analytics is presented as offering limitless possibilities. Because of the vast amounts of data that are generated and gathered within educational systems, there is an opportunity to develop a data-driven understanding of learning and teaching processes (Deeva, Willermark, et al., 2021; Nguyen et al., 2020; Siemens & Baker, 2012; Willermark et al., 2022). Lately, the need for direct involvement of educational research in learning analytics has been acknowledged as the first fundamental pillar of learning analytics. This is to frame the research, i.e., to determine which data to collect and analyze. The second pillar, “capturing”, refers to finding evidence of learning, by identifying and explaining useful data for analyzing and understanding teaching, learning, and developing methods that capture and model learning. Third, “understanding” is associated with how learning theory is informed by large-scale data analysis, as well as the use of data science techniques to understand specific aspects of teaching and learning. The fourth pillar is the “impact” on learning and teaching by providing decision support and feedback based on LA. For example, through dashboards and early alert systems, and personalized and adaptive learning.

However, for LA to reach an impact in practice there is a need to enhance the understanding of

educators' overall practice, their needs, and how to support them in making use of a data-informed process (Viberg & Gronlund, 2021). Furthermore, LA raises important questions about students' autonomy and integrity (Pargman & McGrath, 2019) which has often been overlooked as a result of wanting to explore possibilities with the approach.

For this minitrack, we welcomed papers that address, reflect on, and relate to, the four pillars of learning analytics and datafication in educational settings alongside papers that reflect on changes in learning platforms, teaching and learning practices, and student profiling. We especially welcomed papers that take a critical and ethical perspective on learning analytics.

In total, three papers were accepted for the minitrack this year. In the paper written by Edmilson Cosme et al. (2023) “A systematic review of the factors that impact the prediction of retention and dropout in higher education,” the authors present state-of-the-art knowledge about factors related to student dropout and retention. Such knowledge can, for example, be used as a basis to construct models using data mining techniques such as regression, decision trees, and neural networks. The paper written by Kenzo Muramatsu et al. (2023), “Does Mouse Click Frequency Predict Students' Flow Experience?” explores students' flow experience during the use of educational systems via mouse click frequency. The study contributes to the field of learning analytics by confirming that it is not possible to predict students' flow experience only with mouse click frequency and paving the way for new studies that use different behavior data to predict students' flow experience. Lastly, the paper by López Flores et al. (2023) “Making the Most of Slides and Lecture Captures for Better Performance: A Learning Analytics Case Study in Higher Education” explores how high achiever students make use of the educational material'. The

study includes data from two educational platforms and highlights the value of multiple data sources.

Overall, the contributions demonstrate a breadth of perspectives and approaches to learning analytics.

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