

Learning Analytics Impact: Critical Conversations on Relevance and Social Responsibility

Xavier Ochoa, Simon Knight, Alyssa Friend Wise
Editors-in-Chief — Journal of Learning Analytics — jla.editorial@gmail.com

1. Introduction

Our 2019 editorial opened a dialogue about what is needed to foster an impactful field of learning analytics (Knight, Wise, & Ochoa, 2019). As we head toward the close of a tumultuous year that has raised profound questions about the structure and processes of formal education and its role in society, this conversation is more relevant than ever. That editorial, and a recent online community event, focused on one component of the impact: standards for scientific rigour and the criteria by which knowledge claims in an interdisciplinary, multi-methodology field should be judged. These initial conversations revealed important commonalities across statistical, computational, and qualitative approaches in terms of a need for greater explanation and justification of choices in using appropriate data, models, or other methodological approaches, as well as the many micro-decisions made in applying specific methodologies to specific studies. The conversations also emphasize the need to perform different checks (for overfitting, for bias, for replicability, for the contextual bounds of applicability, for disconfirming cases) and the importance of learning analytics research being relevant by situating itself within a set of educational values, making tighter connections to theory, and considering its practical mobilization to affect learning. These ideas will serve as the starting point for a series of detailed follow-up conversations across the community, with the goal of generating updated standards and guidance for JLA articles.

We now expand the discussion of impact beyond rigour to address larger concerns with how learning analytics can have a transformative influence on education. Specifically, we invite the community to explicitly consider and engage in critical conversations about what kind of impact we are trying to achieve and how we can achieve the desired impact. In doing so, we draw attention to two sets of issues that intersect in important ways with our work in learning analytics and have been brought to the forefront of societal discussion through the events of 2020.

1.1. Equity, Justice, and Inclusion in Education

First, recent attention to long-standing issues of equity, justice, and inclusion in education compel us to carefully consider what role learning analytics has played (intentionally or not) in contributing to systemic inequities, and the role(s) it could play in helping to reveal and dismantle them. How our work intersects and interacts with existing power structures is a critical and necessary question that needs to be addressed by both researchers and practitioners. Asking this question explicitly rejects a reductionist view of analytics as the simple measuring and reporting of information and actively considers the impact that analytics have on the cognitive, emotional, and social well-being of learners in the context of wider social structures. It also compels us to go beyond considering the effects of analytics simply on people as individuals to also attend to their impacts on people as members of groups with different histories of access to and inclusion in the full range of educational practices. Answers to these questions should also consider uses of analytics to reveal bias and expand inclusion to help create more just educational systems (SoLAR, 2020). To address them, we need to consider, as a community and as a journal that documents the main scientific conversations of that community, what concrete measures we can take to ensure that equity, bias, and inclusion issues are consistently attended to in learning analytics work.

One good starting point for discussion of the nuanced implications that analytics work has in complex educational systems is the JLA 2019 special section “What’s the Problem with Learning Analytics,” sparked by an eponymous talk given by Neil Selwyn at the 2018 International Conference on Learning Analytics & Knowledge (LAK’18). The special section contains a robust dialogue between Selwyn and four experts in the field of learning analytics (Carolyn Rosé, Al Essa, Paul Prinsloo, and Rebecca Ferguson) about the “dark side” of learning analytics. The key points and tensions raised are summarized in the guest editorial for the section (Buckingham Shum, 2019), which also points to the nature of our field as a design science, and the concomitant responsibility to “think in terms of the ripples that [our] inventions create at multiple levels of the sociotechnical infrastructure that constitutes ‘education’” (p. 8).

1.2. Remote, Online, and Hybrid Learning

Second, the rapid unplanned shift to remote and hybrid instruction has created an increased appetite for understanding both how students are learning and how teaching efforts are faring. Learning analytics has the potential to provide key insights into the processes of online and face-to-face learning and to support that learning via analytic tools. However, this synergy is

hindered by several interconnected issues, such as lack of uptake and adoption, generalizability, and the relevance of some of our work to actual practice and the power dynamics of data-informed approaches.

The learning analytics community has had a long-standing commitment to developing tools to help teachers better understand their students' needs and learning in online settings, as well as creating student-facing dashboards to help learners organize their studies. However, in this moment of crisis, we, as a field, have failed to bridge the adoption chasm to put these tools into the hands of instructors and learners. This failure, given the clear interest and need for better insight into learning processes, should be a strong motivator for the learning analytics community to engage seriously in a reflexive conversation about the missing links for our field to achieve real impact in educational systems.

More important than simply putting our tools in the hands of relevant stakeholders is an imperative to do so in a way that we can be confident of their use for the best interests of students. The current "shift to digital" has provided fertile ground for questionable analytics practices, driven in part by the unease of not knowing what is going on with learners when they are not present in a bricks-and-mortar classroom and the pressures to compensate for missing standardized scores. These practices have raised justifiable concerns about the commercialization of student data, surveillance, and the algorithmic perpetuation of existing inequities. These practices should receive robust critique from the learning analytics community, which can also articulate clear alternatives in both our research and our actions to provide analytic tools that respect students and instructors as individuals with the power to control their own information. If we are hesitant to address head-on and denounce these ethical concerns emerging in relation to our field, we risk being bundled with them in the minds of education stakeholders.

To continue these conversations about the impact that we want and how we achieve it, we are engaging in two specific initiatives: (1) a special event in 2021 on how to use learning analytics as a tool for social justice and equity in education, and (2) a special section of the journal to showcase the ways in which learning analytics can help the educational community navigate transitions to remote, online, and hybrid instruction.

2. JLA Special Event on Learning Analytics for Equity and Social Justice

Learning analytics practice and research are part of a wider ecosystem of educational and learning practices and societal structures. This year has seen an immediate need for supporting online learning in a way that is equitable and fair. Yet, alongside challenges and positive innovations in implementing online learning, we have seen organizations and individuals succumb to a thirst for oversight, or surveillance, alongside pressure to buy in to commercial solutions whose evidentiary grounding is unclear and whose products are often black boxes.

Our 2018 editorial (Wise, Knight, & Ochoa, 2018) discussed the need for the field to consider the kind of impact it hoped to achieve and the potential of design sciences and participatory approaches to develop the transformative ability of learning analytics. The goal of our work should not simply be to make current systems more efficient, but to probe the ecosystem of our work and to be an agent for change. Research-practice integration and translational and implementation science research are all necessary, but not sufficient, to achieve this. Rigour, as our 2019 editorial (Knight et al., 2019) noted, is similarly a necessary but not sufficient condition.

To foreground this conversation in our community, in 2021 we will host a Special Event on Learning Analytics for Equity and Social Justice. These issues are crucial to our understanding of our impact as a field, and the journal can play an important role in showcasing good practice in the community and shaping its research and communication. Questions to be addressed in this session include how we

- build connections to practice into our work to maximize the potential for it to have positive impact beyond the lab;
- integrate consideration of ethical concerns, understanding that application may come with its own challenges beyond those of research;
- foster constructive critical commentary regarding impacts of learning analytics, including issues of inclusion, exclusion, and bias;
- incorporate ethics, including positive and negative impacts, and soft impacts, of our tools into manuscripts and review processes;
- improve our pipeline of submissions, to support contributions that represent the breadth of potential stakeholders—including practitioners and researchers—who connect to learning analytics; and
- build on the work conducted in other fields, including ethics statements from organizations such as the ACM and global education and computing societies.

The event is intended to foster an open dialogue among the community on these important and complex questions and to generate a tangible outcome for the journal. Implicitly or explicitly, through the work it publishes, JLA represents our field's aspirations and the standards to which we hold ourselves with respect to our impact and to concerns with fairness and equity. It is thus important that we consider how these issues are represented and support impactful work through the guidance we provide to authors, reviewers, and other community stakeholders.

3. JLA Special Section on Learning Analytics in the Age of Remote, Online, and Hybrid Instruction

For the second initiative, we are pleased to announce a call for submissions to a JLA special section on Learning Analytics in the Age of Remote, Online, and Hybrid Instruction. While conducting some or all instruction online is not a new phenomenon, the scale and scope of modalities currently being used and the breadth of populations engaging with them is far greater than ever before. As well, the speed with which these approaches have been, and are being, adopted is unprecedented in recent history, creating both a need and an opportunity for data on learning processes to impact learning. The feedback loops enabled by learning analytics thus have the potential for a profound and immediate impact on educational systems. Additionally, there is already evidence that the effects of the recent shifts in teaching and learning have not been felt equally, with students from historically disadvantaged groups bearing a greater burden (Means, Neisler, & Langer Research Associates, 2020; New America & Third Way, 2020), so the issues of equity discussed above are crucial to consider in this context.

With the theme of impact in mind, the section welcomes empirical work that (a) shows ways learning analytics has helped the transition to remote, online, and hybrid modes of instruction; (b) could be leveraged to support such transitions; and (c) has implications for how we should engage in these modes of instruction. In addition, we welcome analyses of gaps or “failures” to impact as expected, identifying reasons for lack of awareness, uptake, and impact, either through research focusing on these issues or case studies demonstrating their implications. Submission may align with the expectations for any of three regular sections of the journal: research papers, which describe original work of relevance to learning analytics; practical reports, which present case studies of authentic learning analytics applications with relevance to the wider community; and data and tools reports, which introduce novel datasets, tools, or methods to analyze data. Examples of possible submissions are the analysis of the use of analytics tools to support online collaboration, a case study of instructors’ use of analytics to (re)design their courses for a different instructional mode, and an investigation of the effects of information dashboards on student’s self-regulatory behaviour. Details about what each kind of manuscript should include are available on the journal website. Submissions are due April 9, 2021.

4. Review of Current Year’s Articles

This editorial is also a good opportunity to reflect on the impact of the work published in JLA over this year. The recent indexation of JLA in both the Elsevier Scopus Index¹ and the Clarivate Emerging Sources Citation Index² is the most visible indicator of the impact that our published papers have in the academic literature. The manuscripts published in our normal sections and two special sections this year continue to be an example of how the learning analytics community is expanding its focus, productively intersecting with other branches of educational research.

We began this year with the special section “Beyond Cognitive Ability,” which explored ways in which learning analytics could be used to assess and provide feedback on social, emotional, and metacognitive aspects of the learning experience (Joksimovic, Siemens, Wang, San Pedro, & Way, 2020). Four papers in this section discuss the influence of persistence and resilience (Porter et al., 2020), identity (Crossley, Karumbaiah, Ocumpaugh, Labrum, & Baker, 2020), group communication (Dowell, Lin, Godfrey, & Brooks, 2020), and distributed cognition (Kent & Cukurova, 2020) in different learning contexts.

A second special section, in the current issue, “Learning Design and Learning Analytics,” closes the year by showcasing how learning analytics has usefully informed learning design decisions and how learning design has influenced learning analytics integration and use (Macfadyen, Lockyer, & Rienties, 2020). Notable examples of the connections between analytics and design are the use of multimodal data to infer affective states that could better assess learning design outcomes (Mangaroska, Sharma, Gašević, & Giannakos, 2020) and the proposal of a multilevel framework to integrate learning analytics into learning design (Law & Liang, 2020).

Apart from these two special sections, JLA continues to publish a rich selection of research papers, practitioner reports, and data and tools reports, including those extended from LAK contributions. One identifiable theme in the papers accepted for publication this year is a focus on the creation of prediction models for learning analytics. For example, Chen and Cui (2020) use deep learning techniques to predict course performance, and Faucon, Olsen, Haklev, and Dillenbourg (2020) create a set of predictors to estimate, in real time, the best transition moments between tasks. In future studies, it will be interesting to see the effect that these models have once they are integrated into widely deployed analytics tools. Such work follows in the valuable tradition of Herodotou, Haydenova, Borooa, Gilmour, and Rienties’s (2020) practitioner report, where the impact of a predictive model in student retention was evaluated through a randomized controlled experiment.

¹ JLA in the Elsevier Scopus Index: <https://www.scopus.com/sourceid/21100932472>

² JLA in the Clarivate Emerging Sources Citation Index: <https://mjl.clarivate.com/search-results?issn=1929-7750>

5. Conclusion

This editorial acts as an invitation to the learning analytics community to engage with the complex set of issues surrounding the question of impact in a variety of ways: by participating in the upcoming special event on Learning Analytics for Equity and Social Justice; joining in one of the follow-up conversations on What We Mean by Rigour in Learning Analytics; contributing to the special section on Learning Analytics in the Age of Remote, Online, and Hybrid Instruction; or incorporating a focus on impact in work submitted to one of our regular research paper, practical report, or data and tools report sections. We also invite the community to continue building on the conversations in this editorial in the different interactions they have with each other and with those external to our community throughout the year. We welcome your input and continued thinking on concrete steps that we can take to foster learning analytics as an impactful field and additional areas under this umbrella to which we should turn our focus.

The editors extend particular thanks this year to Sasha Poquet, who stepped down from her position as journal layout editor after many years of dedicated service and supported Rosa Lisa Iannone in taking over this role. To Rosa Lisa, we extend a warm welcome. We are also grateful to the UTS ePress team, who after working with us through six years of publishing, assisted in our transition to the PKP community of open journals. Finally, we want to thank the many scholars who have provided service to JLA throughout the year, acting as reviewers, taking on the editorial duties of special section editors, and sitting on the editorial board. We encourage all readers to consider additional ways they can engage with the journal, from volunteering to review, to submitting their own work, to proposing new special sections on important topics for the community. As this past year has clearly shown, there is much work to be done, and nothing that should be taken for granted. We look forward to working with this community as we continue to tackle the important, challenging, and powerful questions surrounding the use of data to positively foster an impactful field of learning analytics.

References

- Buckingham Shum, S. (2019). Critical data studies, abstraction and learning analytics. *Journal of Learning Analytics*, 6(3), 5–10. <https://dx.doi.org/10.18608/jla.2019.63.2>
- Chen, F., & Cui, Y. (2020). Utilizing student time series behaviour in learning management systems for early prediction of course performance. *Journal of Learning Analytics*, 7(2), 1–17. <https://dx.doi.org/10.18608/jla.2020.72.1>
- Crossley, S. A., Karumbaiah, S., Ocumpaugh, J., Labrum, M. J., & Baker, R. S. (2020). Predicting math identity through language and click-stream patterns in a blended learning mathematics program for elementary students. *Journal of Learning Analytics*, 7(1), 19–37. <https://dx.doi.org/10.18608/jla.2020.71.3>
- Dowell, N., Lin, Y., Godfrey, A., & Brooks, C. (2020). Exploring the relationship between emergent sociocognitive roles, collaborative problem-solving skills and outcomes: A group communication analysis. *Journal of Learning Analytics*, 7(1), 38–57. <https://dx.doi.org/10.18608/jla.2020.71.4>
- Faucon, L., Olsen, J. K., Haklev, S., & Dillenbourg, P. (2020). Real-time prediction of students' activity progress and completion rates. *Journal of Learning Analytics*, 7(2), 18–44. <https://dx.doi.org/10.18608/jla.2020.72.2>
- Herodotou, C., Naydenova, G., Boroowa, A., Gilmour, A., & Rienties, B. (2020). How can predictive learning analytics and motivational interventions increase student retention and enhance administrative support in distance education? *Journal of Learning Analytics*, 7(2), 72–83. <https://dx.doi.org/10.18608/jla.2020.72.4>
- Joksimovic, S., Siemens, G., Wang, Y. E., San Pedro, M. O. Z., & Way, J. (2020). Editorial: Beyond cognitive ability. *Journal of Learning Analytics*, 7(1), 1–4. <https://dx.doi.org/10.18608/jla.2020.71.1>
- Kent, C., & Cukurova, M. (2020). Investigating collaboration as a process with theory-driven learning analytics. *Journal of Learning Analytics*, 7(1), 59–71. <https://dx.doi.org/10.18608/jla.2020.71.5>
- Knight, S., Wise, A., & Ochoa, X. (2019). Fostering an impactful field of learning analytics. *Journal of Learning Analytics*, 6(3), 1–4. <https://dx.doi.org/10.18608/jla.2019.63.1>
- Law, N., & Liang, L. (2020). A multilevel framework and method for learning analytics integrated learning design. *Journal of Learning Analytics*, 7(3), 98–117. <https://dx.doi.org/10.18608/jla.2020.73.8>
- Macfadyen, L.P., Lockyer, L., & Rienties, B. (2020). Learning design and learning analytics: Snapshot 2020. *Journal of Learning Analytics*, 7(3), –12. <https://dx.doi.org/10.18608/jla.2020.73.2>
- Mangaroska, K., Sharma, K., Gašević, D., & Giannakos, M. (2020). Multimodal learning analytics to inform actionable interventions in learning design. *Journal of Learning Analytics*, 7(3), 79–97. <https://dx.doi.org/10.18608/jla.2020.73.7>
- Means, B., & Neisler, J., with Langer Research Associates. (2020). *Suddenly online: A national survey of undergraduates during the COVID-19 pandemic*. San Mateo, CA: Digital Promise. Retrieved from https://digitalpromise.org/wp-content/uploads/2020/07/ELE_CoBrand_DP_FINAL_3.pdf

- New America & Third Way (2020). *New America Higher Ed survey*. New York, NY: Global Strategy Group. Retrieved from <https://www.thirdway.org/memo/new-polling-from-new-america-third-way-on-covid-19s-impact-on-current-and-future-college-students>
- Porter, T., Catalán Molina, D., Blackwell, L., Roberts, S., Quirk, A., Lee Duckworth, A., & Trzesniewski, K. (2020). Measuring mastery behaviors at scale: The Persistence, Effort, Resilience and Challenge-Seeking Task (PERC). *Journal of Learning Analytics*, 7(1), 5–18. <https://dx.doi.org/10.18608/jla.2020.71.2>
- Society for Learning Analytics Research (SoLAR) (2020, June). *Statement of support and call for action on social justice and dismantling injustice in education*. Edmonton, AB: SoLAR. Retrieved from <https://www.solaresearch.org/2020/06/statement-of-support-and-call-for-action/>
- Wise, A., Knight, S., & Ochoa, X. (2018). When are learning analytics ready and what are they ready for? *Journal of Learning Analytics*, 5(3), 1–4. <https://dx.doi.org/10.18608/jla.2018.53.1e>