Learning Analytics in a Mentoring Context: Through a Sociocritical Lens

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Introduction

New data-driven approaches in learning analytics (LA) exploiting artificial intelligence, data-mining, and emerging technologies have rapidly expanded the collection and uses of learners' data. However, the consideration of potential harm and realities of ethical implications has not kept pace, raising concerns about ethical and privacy issues (Holstein & Doroudi, 2019; Prinsloo & Slade, 2018). Although the theoretical discussion of the issues and side effects of LA or using technologies such as AI has long existed, few studies examine actual responses and on-the-ground concerns in the field (Tsai et al., 2021).
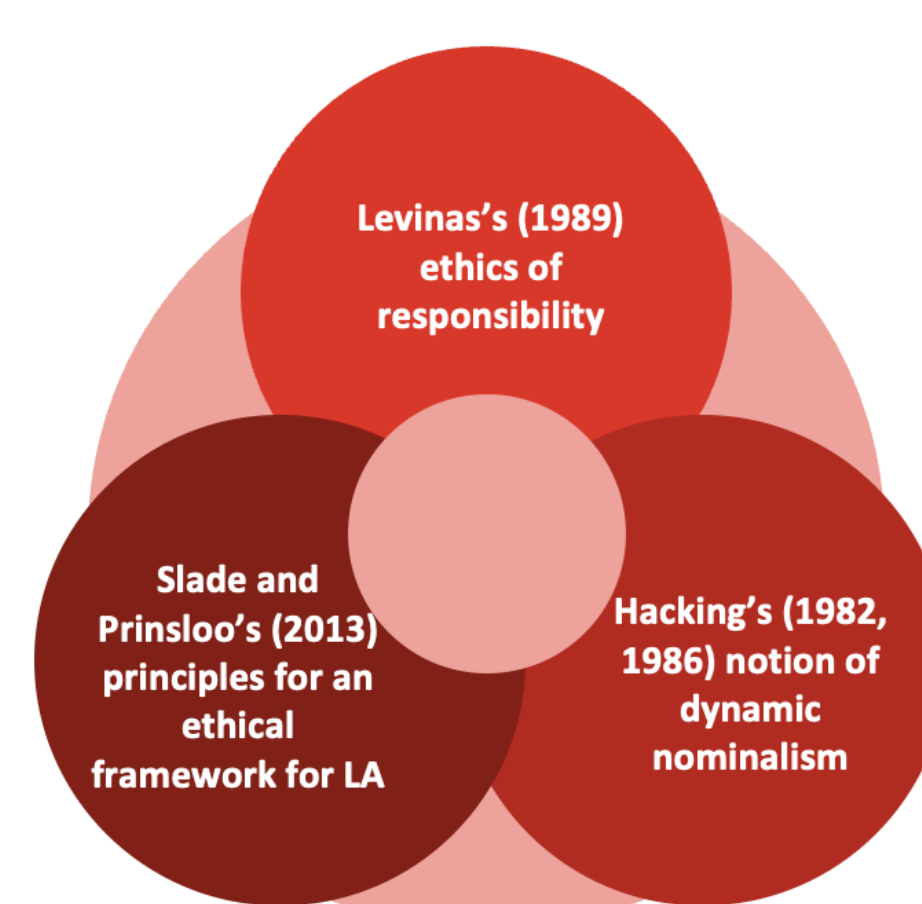
This study contributes a socio-critical lens to urgent and emergent questions of responsible LA lending mentor voices in the context of an online mentorship program through which undergraduate students mentored secondary school students. Furthermore, this study explores power relationships, duty, and the dynamics and complexities surrounding the agency of the involved parties and individuals in the context of mentoring. Mentoring as an educational and interactional context has been minimally examined in the field of LA, yet has the potential to provide important insights precisely due to the unique context and expectations of mentor–mentee relationships, educational but often without the constraints of learning standards or traditional assessments.

Study Purpose

The purpose of this study is to lend the voices of undergraduate mentors to a growing critical conversation on fairness, equity, and responsibility in LA. This empirical study reveals the complexities and dynamics in LA practice resulting from linkages between such phenomena as self-awareness of data ethics and understandings of privacy, perceptions of trust and risk, agency, context, and culture.

While conducting a study on LA for learning design in a virtual mentoring context to understand and support mentors confronted with LA, we discovered an interesting phenomenon that five of six participating mentors avoided disclosing to mentees that they had viewed their LA data. Therefore, this current study was driven by the initial research questions: How and why did mentors hide from mentees that they had seen their LA data although they were not asked to do so? And how did the LA report facilitate or hinder creating an equitable, fair, and responsible environment in online mentoring situations? More specifically, the study's purpose was to investigate mentor perceptions of LA and any ethical tensions experienced based on the LA practices in a virtual mentoring context.

The frameworks of Slade and Prinsloo (2013), Hacking (1982, 1986), and Levinas (1989) were used to understand the moral hardship the mentors expressed and to map the ethical reasoning, paradoxes of LA, and its implications. Mentor voices are synthesized to propose a design guidance for a responsible LA system.

Levinas's (1989) ethics of responsibility

Slade and Prinsloo's (2013) principles for an ethical framework for LA

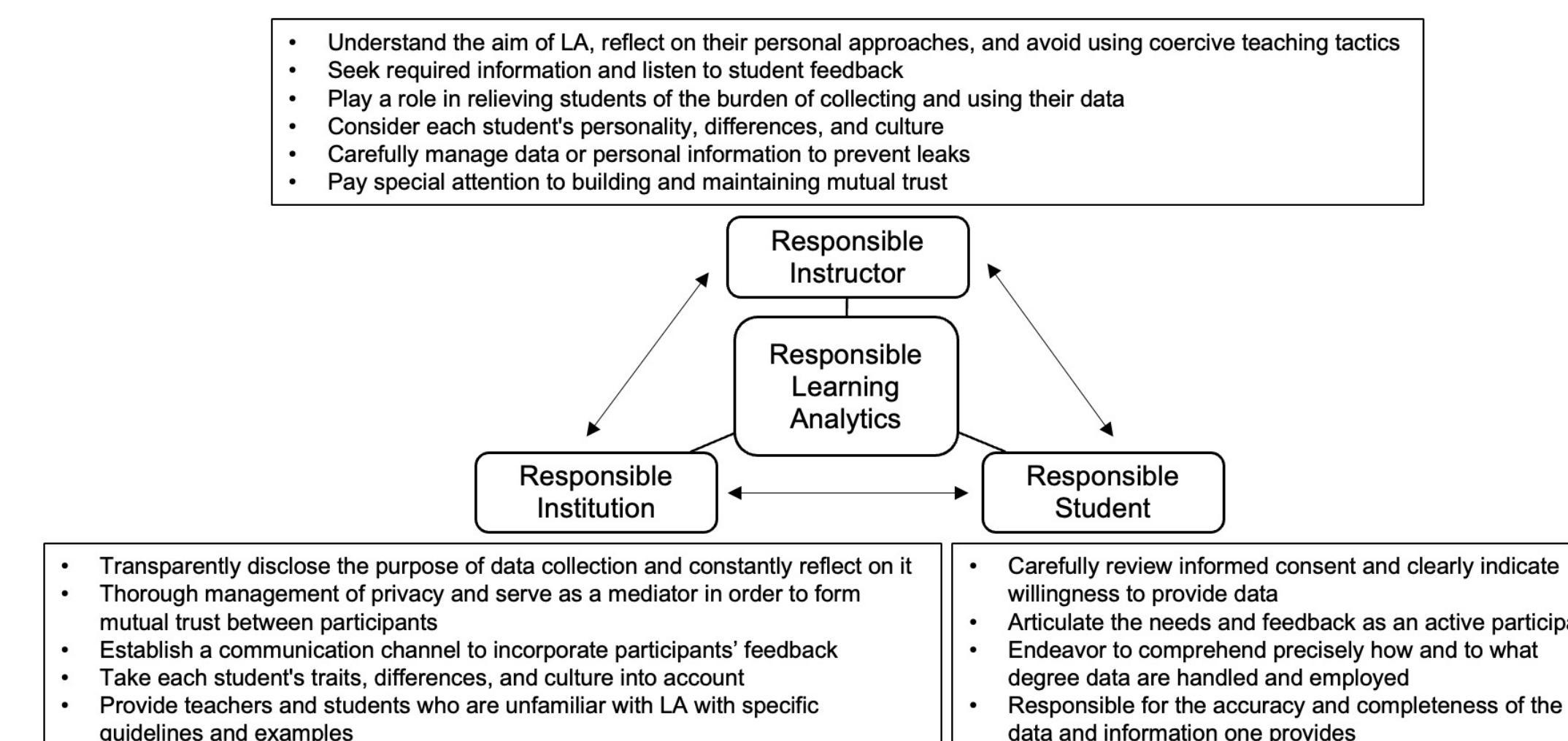Hacking's (1982, 1986) notion of dynamic nominalism

Methods

Study Context S Mentoring Program is an ongoing six-week online mentoring program that supports secondary school students (mentees) through mentorship from undergraduate students (mentors). Mentors and mentees interact via a digital online learning platform designed by a local team. Synchronous online sessions use a web-conferencing tool. The program provides a customized "LA report" to the mentors containing assigned mentees' visualized data such as word networks, graphs, and charts based on data collected during asynchronous and synchronous activity from the prior weeks. Specifically, mentee clickstream data, postings, and video stream data are collected from asynchronous activity, and transcripts of talk during online mentoring sessions are created from the audio of synchronous sessions. Each report includes both individual mentee data and some summarized data for comparative context. Data for this specific study were collected through three rounds of semi-structured interviews with four mentors who mentioned hiding the fact that they had seen mentee data.

Data Analysis The study was conducted in three phases. *Phase 1* developed initial descriptions of the data, attending closely to participant worlds with the goal of getting as "close" to their view as possible (Larkin et al., 2006). Transcripts were coded descriptively with attention to remarks that could be relevant to the initial research questions. The authors worked together to create a coherent, third-person initial interpretative description of the phenomenon. *Phase 2* positioned the initial description from Phase 1 in a broader social, cultural, and theoretical context to provide critical and conceptual analysis. Through Phase 2, the authors developed a more overtly interpretative description, engaging with the conceptual frameworks. *Phase 3* entailed confirmation and consolidation of themes.

Findings / Discussion and Implications

Analysis suggests that mentors' LA use and reflection on ethical concerns were shaped by: 1) their perceptions of the affordances and constraints of LA, 2) their understanding of the scope and boundaries of LA, 3) ethical tensions and dilemmas in the LA system, 4) paradoxical demands of mentors, and 5) what constitutes "fairness," "equity," and "responsibility" in LA.

Design recommendations for responsible LA systems (Figure ▶), synthesized from mentors and extant literature, provide guidelines for responsible instructors, responsible students, and responsible institutions.

Responsible Instructor
- Understand the aim of LA, reflect on their personal approaches, and avoid using coercive teaching tactics
- Seek required information and listen to student feedback
- Play a role in relieving students of the burden of collecting and using their data
- Consider each student's personality, differences, and culture
- Carefully manage data or personal information to prevent leaks
- Pay special attention to building and maintaining mutual trust

Responsible Learning Analytics

Responsible Institution
- Transparently disclose the purpose of data collection and constantly reflect on it
- Thorough management of privacy and serve as a mediator in order to form mutual trust between participants
- Establish a communication channel to incorporate participants' feedback
- Take care of student's traits, differences, and culture in mind account
- Provide teachers and students who are unfamiliar with LA with specific guidelines and examples

Responsible Student
- Carefully review informed consent and clearly indicate willingness to provide data
- Articulate the needs and feedback as an active participant
- Endeavor to comprehend precisely how and to what degree data are handled and employed
- Responsible for the accuracy and completeness of the data and information one provides

Ethical Relationality in Mentoring and Beyond Questions of ethics and responsibility in educational contexts centrally concern how the relations between parties can co-exist as relations that support human learning and development while also entailing an inherent imbalance of power be it teacher/student, mentor/mentee, parent/child, or between a learner/educator and an institution or the state. Mentors found themselves both ethically responsible to and for their mentees as an Other with infinite potential, and simultaneously expected to engage with their mentees through the lens of the LA reports that created portraits of mentees out of data, "quantified data objects" (Prinsloo & Slade, 2016), or a form of data-subjectivity, restricted in detail and limited in possibility (Hacking, 1982). The paternalistic nature of collecting learning activity data, the asymmetrical power relationship between mentor and mentee based not only on the educational position but also on age and university status, and the importance of constructing mutual trust in mentorship all increase the importance of caring for intersubjective individual agency (Levinas, 1989; Prinsloo & Slade, 2016).

Concerning the Learner as a Data-subject The formation of new categories and labels through the LA report created new ways of conceiving mentees (Hacking, 1982). The usage of the report not only exacerbated ethical issues but also caused the formation of preconceptions. Data collected to compose the report and mentors' attempts to connect the data to the mentees' background information inadvertently amplified the inherent vulnerability of some mentees. Beyond issues of surveillance, there is a danger that learners will become no more than data-subjects. The techno-optimism (Danaher, 2022) of LA in support of responsive instruction faces real challenges when considered from a critical perspective, noting the increased vulnerabilities of those already vulnerable to being surveilled or produced as subjects with limited educational opportunities.

Considering the Possibilities of Agency, Transparency, and Choice Mentors, aligning with existing literature, insisted that the host organizations should provide explicit commitments to transparency regarding "what data is collected, for what purposes, with whom the data may be shared, (and under what conditions)". Lack of clear host organization expectations was one of the reasons mentors cited that they concealed their data access from mentees though they were not explicitly asked to do so. Implications suggest that an opt-in/opt-out option is insufficient to provide transparency or agency. Consideration must include how the mentee's perception of choice may be shaped by social context and power imbalance. Anonymity in choice is one possibility but is likely not feasible when the identifiable analytics collected are directly available to an educator in relation to an individual student. The Other - here the mentee - is a more vulnerable participant (Slade & Prinsloo, 2013) because even when informed choices are provided, the choices themselves cannot sit outside the existing social and educational context of power imbalance.

Conclusion

We reveal that the LA report's existence itself posed ethical tensions and dilemmas for the mentor–mentee relationship and beyond. In addition, the formation of new categories and labels through the LA report brought mentors new ways of perceiving mentees, for instance as data-subjects. Mentor voices, aligning with existing literature, add a new dimension to conceptual mapping for building responsible LA, suggesting the importance of considering possibilities of agency, transparency, and choice. It is noteworthy that such divergence existed among a small group of mentors working in the same context, suggesting even greater divergence in a larger sample or across cultural contexts.

Qualitative approaches are less prevalent than quantitative in LA research, and this interpretative phenomenological study adds thickness to our understanding of LA systems. While the inherently small scale of IPA as a method poses limitations in terms of generalizability, it offers thickly textured empirical insights that provide direction for future research, which must attend to diverse voices, including learners, teachers, designers, institutions, and corporations. Additional future work must examine the epistemological assumptions of LA systems and users and extend a critical examination of teaching, learning, and surveillance in an LA-inundated world.

Acknowledgments

References

Danaher, J. (2022). Techno-optimism: an analysis, an evaluation and a modest defence. *Philosophy & Technology*, 35(2), 1-29. https://doi.org/10.1007/s13347-022-00550-2

Hacking, I. (1982). Biopower and the avalanche of printed numbers. *Humanities in Society*, 5, 279-295.

Hacking, I. (1986). Making up people. In T. C. Heller, M. Sosna, D. E. Wellbery, A. I. Davidson, A. Swidler, & I. Watt (Eds.), *Reconstructing individualism: Autonomy, individuality, and the self in Western thought* (pp. 222-236). Stanford, CA: Stanford University Press.

Holstein, K., & Doroudi, S. (2019). Fairness and equity in learning analytics systems (FairLAK). *Companion Proceedings of the Ninth International Learning Analytics & Knowledge Conference (LAK 2019)*, 1–2.

Larkin, M., Watts, S., & Clifton, E. (2006). Giving voice and making sense in interpretative phenomenological analysis. *Qualitative Research in Psychology*, 3(2), 102-120. https://doi.org/ 10.1191/1478088706qp062oa

Lévinas, E. (1989). *The Levinas Reader: Emmanuel Levinas*, Seán Hand (ed.), Oxford: Blackwell Publishers.

Prinsloo, P., & Slade, S. (2015). Student privacy self-management: Implications for learning analytics. *Proceedings of the Fifth International Conference on Learning Analytics And Knowledge*, 83–92. https://doi.org/10.1145/2723576.2723585

Prinsloo, P., & Slade, S. (2016). Student vulnerability, agency, and learning analytics: An exploration. *Journal of Learning Analytics*, 3(1), 159–182. https://doi.org/10.18608/jla.2016.31.10

Slade, S., & Prinsloo, P. (2013). Learning analytics: Ethical issues and dilemmas. *American Behavioral Scientist*, 57(10), 1510–1529. https://doi.org/10.1177/0002764213479366

Tsai, Y. S., Whitelock-Wainwright, A., & Gašević, D. (2021). More than figures on your laptop: (Dis)trustful implementation of learning analytics. *Journal of Learning Analytics*, 8(3), 81-100. https://doi.org/10.18608/jla.2021.7379

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