Advances in Writing Analytics: Mapping the state of the field

Antonette Shibani
Connected Intelligence Centre, University of Technology Sydney, Australia
antonette.shibani@uts.edu.au

Ming Liu
Connected Intelligence Centre, University of Technology Sydney, Australia
School of Computer and Information Science, Southwest University, China
ming.liu@uts.edu.au

Christian Rapp
ZHAW, School of Management and Law, Center for Innovative Teaching and Learning, Winterthur, Switzerland
rapp@zhaw.ch

Simon Knight
Faculty of Transdisciplinary Innovation, University of Technology Sydney, Australia
Simon.Knight@uts.edu.au

ABSTRACT: Writing analytics as a field is growing in terms of the tools and technologies developed to support student writing, methods to collect and analyze writing data, and the embedding of tools in pedagogical contexts to make them relevant for learning. This workshop will facilitate discussion on recent writing analytics research by researchers, writing tool developers, theorists and practitioners to map the current state of the field, identify issues and develop future directions for advances in writing analytics.

Keywords: writing analytics, learning analytics, collaborative writing, writing theories, writing analytics advances

1   BACKGROUND

As technological capabilities progress in the field of understanding natural language, there is increasing interest in their application to study and improve writing. *Writing analytics* has emerged as a sub-domain of learning analytics to support the analysis of written products and processes in educational contexts (Buckingham Shum et al., 2016). The time-consuming and labor-intensive process of assessing writing makes it hard for educators to provide formative feedback on students' writing, which could be supported by writing analytics. An application of writing analytics that has gained traction is the use of tools that provide automated feedback and writing instruction to improve students' writing skills (Allen, Jacovina, & McNamara, 2015; Liu, Li, Xu, & Liu, 2017; Woods, Adamson, Miel, & Mayfield, 2017). Such tools developed across different educational levels engage students directly to aid in the improvement of their writing skills. Another objective of writing analytics tools

and techniques is to understand the writing *products* and *processes* deeper to contribute to the theory and research on writing, which can then lead to its application in writing contexts (McNamara, Graesser, McCarthy, & Cai, 2014). In addition to studying user behavior and interaction through log data, this can inform design choices in writing tool development. These applications build on the main notion of developing a synergy between writing analytics technology and pedagogical practice, so that the educational context is meaningfully embedded in the use of these technologies. Three previous workshops run on this topic have focused on critical perspectives and community building around writing analytics in LAK (Buckingham Shum et al., 2016), developing a writing analytics literacy and practitioner capacity (Knight, Allen, Gibson, McNamara, & Buckingham Shum, 2017) and a hands-on-training for developing this literacy by understanding technical affordances and aligning them to pedagogical feedback (Shibani, Abel, Gibson, & Knight, 2018).

2   WORKSHOP FOCUS

The proposed fourth workshop in the series will build on the previous writing analytics workshops to develop writing analytics literacy and map the field for the future. The focus will be on critically assessing the current state of work being done in the field, and how it could be directed towards the future by considering key issues. The key thread of integrating writing analytics with pedagogy will be emphasized, by connecting theory, pedagogy and assessment to close the feedback loop (Knight, Shum, & Littleton, 2014; Shibani, Knight, Buckingham Shum, & Ryan, 2017). The pedagogic relevance and the question of why writing analytics is employed and what it can add to the existing system will be brought into discussion by practitioners. In this way, we maintain a productive dialogue among different stakeholders like educators, researchers and developers for effective implementation of learning analytics in the classroom (Thompson et al., 2018; Shibani, Knight, & Buckingham Shum, 2019).

The landscape of tools that offer support for writing is constantly changing with new tools getting introduced and the existing ones getting updated, to incorporate the technical advances and the data made available over time (Liu, Calvo, Pardo, & Martin, 2015; McDonald, Moskal, Gunn, & Donald, 2018; Rapp & Ott, 2017; Woods et al., 2017). The ways in which we study writing, and respective systems that support its instruction and practice, have also considerably changed with technological affordances like keystroke-level analysis which allow for a more fine-grained level of analysis, and multiple sources of data which allow for triangulation and validation while studying writing processes. It is important to share knowledge from related work on writing, for instance process-mining and temporal analysis, that can contribute to writing analytics research. This will expand the knowledge base of the community and find relevant opportunities to meaningfully collect, analyze, visualize and use data to derive insights that are relevant for the learning contexts. Hence, the workshop will encourage presentations on various tools and techniques to understand and improve writing.

With growth in the field of Writing Analytics, the multidisciplinary of the field, and the different ways in which researchers engage with its development, it is important to align the goals of the field within the community. Community building generates a shared understanding and common goals to work towards the future of the field. While considering the potential pathways for the field to progress, we

will also include discussions on the pushbacks and critical perspectives that can affect how the field moves forward. This includes legal and ethical considerations on the use of students' data, development of learning theories to support writing analytics technology, and evaluation methods to assess these advances for their real impact to meaningfully contribute to writing.

Thus, the fourth workshop is intended to:

1. Build on the existing dialogue around developing writing analytics literacy and pedagogic integration by connecting different stakeholders like practitioners and researchers.

2. Expand the knowledge of the field by discussing about novel approaches and tools being developed by different researchers that contribute to writing analytics research.

3. Move the field forward by building a community for writing analytics research and thinking about pushbacks and potential future steps.

3 SUBMISSIONS AND WORKSHOP FORMAT

Workshop activities and schedule

The full-day workshop will include a number of presentations and demonstrations from researchers to share their work within the writing analytics community (depending on the interest generated). It will include round-table and open discussions throughout the day to steer the direction of writing analytics work and possible pathways for future advances in the field. The provisional program is given below:

Introductions (30 minutes): Introductions of workshop organizers and participants, and a quick background to the field of writing analytics.
Presentations (10-15 minutes each): Presentations and demonstrations from accepted papers and invited researchers on their writing analytics tool or technology, the data collected by the tool, analysis of writing data and how it contributes to writing theory, and the direction of future work.
Discussion Blocks (5-10 minutes each): Discussion blocks will follow each presentation to ask critical questions on what can be done and analyzed from the tool/data, how and why.
Round-table discussion (1 hour): Key topics for discussion from the presentations will be selected for round-table discussion. Participants can move around tables to discuss more in detail on the topic they are interested in. Potential topics include collaborative writing analytics, analytical and reflective writing analytics, writing feedback visualization and writing theories.
Open discussion (30 minutes): Open discussion facilitated among all participants on the advances in writing analytics and its potential future, co-creation of shared notes and resources.
Writing analytics community engagement (30 minutes): Building the community of writing analytics researchers by connecting existing and new researchers in the field. Formation of a formal writing analytics committee if participants are interested.
Concluding remarks and future directions (15 minutes): Brief summary and closing remarks on the workshop with future steps.

Program Committee

Co-chairs of the workshop will invite researchers and companies active in the field of writing analytics to present their work in the form of tool demonstrations or presentations. They will also review submissions for presentations by extending an open call for participation.

Participation, Required Equipment and Dissemination

Participation will be 'mixed' – in addition to participants who are invited to present their work, any interested delegate may register to attend. An invitation will be extended to participants of previous workshops, writing researchers who are not (yet) involved with the technology side, and international researchers active in the field to share their work and different perspectives on Writing Analytics. An open call for participation will be put out to encourage others to present their research and become more actively involved in the LAK writing analytics community. A website setup for the workshop will archive the event and disseminate the notes to participants. Papers accepted for presentation will be published in the companion proceedings and linked to the website.

The workshop will be of interest to a wide range of LAK delegates including: students and researchers engaged in writing research and the use of writing tools; educators in schools, universities and businesses; data analysts; and companies active or potentially active in the field. The workshop does not require any special equipment (WiFi, data projector and power strips aside). Flexible seating is preferred for breakout discussion groups. Participants will be encouraged to bring their own devices to contribute to shared notes. Workshop organizers will make use of listservs (SoLAR, Learning Analytics Google group, EDM-announce, ISLS, SIG-LS, ICCE) and their own personal networks to advertise the workshop.

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