

Learning Analytics in Academic Writing Instruction – Opportunities Provided by Thesis Writer (TW)

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Abstract: No thesis - no graduation. Academic writing poses manifold challenges to students, instructors and institutions. Consequently, the question arose to what extent academic writing instruction can be supported electronically. With Thesis Writer (TW), a domain-specific, technology-supported learning environment for scaffolding academic writing, combined with an online editor optimised for producing academic text was implemented. Recently, a tracking function was also implemented that allows for fine-grained studying of user interaction with the system, and therefore also their writing and learning processes. In the demonstration, the researchers will present the data types collected, the tracking technology, and the learning analytics opportunities that TW provides.

Keywords: learning analytics, academic writing instruction, instructional technology

Introduction

Thesis Writer (www.thesiswriter.eu) is a domain-specific, technology-supported learning environment for scaffolding academic writing, combined with an online editor optimised for producing academic text [Ra15]. It allows for the scaling of academic writing instruction [RK16]. Following [GP07] TW supports students in particular with: (1) orientation, planning and focusing; (2) proposal writing; (3) text production by tutorials and new linguistic tools including a phrasebank, examples, and linguistic support from an integrated, domain-specific corpus analysis tool; and (4) collaboration and coordination. TW offers functionality that is different to existing automated scoring and feedback tools [AJM15], and is designed for a different genre, specifically the IMRD (Introduction, Methods, Results, and Discussion) scheme [Sw04] which is a standard structure for many theses and research articles.

Recently, a tracking function has been implemented within TW: All user (text) entries and system interactions are logged and timestamped. This allows for the research of support functions provided by TW, to analyse how they are used, and even more interesting, what happens afterwards. For example, it is possible to study if users typed text after using an aid provided or, if they sought other help instead. A currently implemented ‘replay-function’, based on the timestamped data logs (user-system interaction, including text produced in the editor), allows for displaying as if recorded by a screen recorder; however, circumventing problems when utilising screen recording as

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reported by [Ta06]. Therefore, TW will, unobtrusively, allow for research of the following aspects: (1) Usage of TW as an Intelligent Tutoring System; (2) Usage and effect of the aids provided. The effect of the aids can be assessed via corpus analysis, e.g. analysis can include to what extent phrases provided by the phrasebank are incorporated in the text; (3) TW allows real-time collaboration, similar to Google Docs, for instance in teamwork assignments. Here it is possible to analyse interaction among users and the system; and (4) Analyse the text production itself, e.g. time spent on certain sections, revisions processes etc. The described data collection functions allow, firstly, for the in-depth study of writing processes of single users and/or groups (data collection can be confined to groups e.g. classes). Secondly, TW allows for comparison among different users (e.g. social science users in comparison to natural science users, or undergraduates compared to postgraduates) and, given that TW is available in both German and English languages, also between L1 and L2 writers.

TW tracking is triggered using modern XHTML technology from the user's browser. As interaction occurs, entered text is auto-saved and logged to the database every time the user pauses between keystrokes for <0.5 seconds. Logging is performed on a session basis (session is kept alive within TW's text editor), chained entries allow for tracking users' interaction path. To date, TW has created some 140,000 log entries, which include login/-out, navigation, document/group management, writing/revising, and accessing contextual aid functionality (tutorials, phrase base, sample text, linguistic support).

References

- [AJM15] Allen, L.; Jacovina, M.; McNamara, D.: Computer-based writing instruction. In (MacArthur, C.A, Graham, S. & Fitzgerald, J., Hrsg.): Handbook of writing research, The Guildford Press, New York, S. 316-329, 2015.
- [GP07] Graham, S.; Perin, D.: A Meta-Analysis of Writing Instruction for Adolescent Students. *Journal of Educational Psychology* 99/3, S. 445-476, 2007.
- [RK16] Rapp, C.; Kruse, O.: Thesis Writer (TW) – Tapping scale effects in academic writing instruction (demonstration). In *Proceedings of the Third (2016) ACM Conference on Learning @ Scale*. ACM, New York, S. 325-326, 2016.
- [Ra15] Rapp, C.; Kruse, O.; Erlemann, J.; Ott, J.: Thesis Writer – A System for Supporting Academic Writing. In *Proceedings of the 18th ACM Conference Companion on Computer Supported Cooperative Work & Social Computing (CSCW2015 Companion)*. ACM, New York, S. 57-60, 2015.
- [Sw04] Swales, J.: *Research genres: Explorations and applications* (Cambridge applied linguistics series). Cambridge University Press, Cambridge, 2004.
- [Ta06] Tang, J.; Liu, S.; Muller, M.; Lin, J.; Drews, C.: Unobtrusive but invasive: using screen recording to collect field data on computer-mediated interaction. In *Proceedings of the 20th Anniversary ACM Conference on Computer Supported Cooperative Work*. ACM, Banff, S. 479-482, 2006.