Article

Special edition on language learning and learning analytics [Editorial]

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Editorial

Special edition on language learning and learning analytics

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Learning analytics is understood as "the measurement, collection, analysis and reporting of data about learners in their context, for purposes of understanding and optimizing learning and the environment in which it occurs" (Siemens et al., 2011, n.p.). Over the last five years learning analytics has seen an increasing amount of educational research investigate its potential for tracking learners' online and offline activities, and visualizing and analyzing their interactions, either with each other, their instructors, and/or with a variety of digital applications. Although research in the past tended to focus on self-reported data from students, typically focused on their perceptions of autonomous learning behavior, the development of large-scale online learning environments, has meant that vast amounts of data can now be collected.

One of the potential opportunities presented by learning analytics is that teachers may acquire valuable data on learners who are succeeding and failing, and thereby gain insights into the factors which influence course withdrawal or student retention. Faced with such information, teachers and student advisors may be able to intervene and advise students on their further learning paths. Typically, the data are based on the combination of clicks in a virtual learning environment with examination or test results and this does present limitations in that it may inform us about *what* happened rather than *why*. Nevertheless, it is clear that data of this kind may provide some valuable clues in relation to retention and success, patterns of learning habits, uses of specific course components and enable course developers to improve course content and teachers and support staff to identify struggling students and

design pedagogical interventions. From the learner perspective access to relevant data in the form of dashboards may enable them to reflect on their achievements and patterns of behaviour in relation to others in their cohort. Dashboards may allow students to auto-evaluate their progression and learning behaviour and to compare their profile to user patterns of their peers and advised usage of the material by instructors. Examples of charts to be included in dashboards could be (individual and group) activity timelines, learner preferences spider charts and educational content heat maps. Extracts from learner dashboards may also be used as indicators of achievement in online student portfolios. Educators may thus receive dynamic and real-time overviews of how their students are progressing, which students might be at risk of dropping out or of failing a course and which parts of the courses cause difficulties and/or require more feedback. It is no surprise that research on learning analytics should be of value to teachers, course and materials designers, administrators and students themselves, as a variety of stakeholders share an interest in how to optimize the learning process and to understand how learning takes place online.

The turn towards the use of so-called 'big data' has also been evident among researchers, administrators and teachers involved in second language development, particularly among those involved in the community of computer-assisted language learning (CALL). Over the last three decades language education has had a rich history of research focusing on the effectiveness of learning activities and the impact these have had on learning outcomes and student behavior and. The current wave of interest in learning analytics new opportunities to CALL research that certainly appear worthy of further investigation. To date only one project to our knowledge, the EU funded VITAL project (Visualisation and Tools to Monitor Online Language Learning and Teaching), has examined these developments in detail (see http://www.project-vital.eu/). VITAL aimed to develop a model of xAPI activity statements for the implementation of learner tracking in language learning environments.

This approach enabled the analysis of autonomous learning processes using process mining algorithms to compare learning behaviour to the intended pedagogic objectives of the tools, to map existing learning patterns and to feed back this new knowledge to the most important educational actors themselves, e.g. the students and their lecturers. It also aimed to identify user profiles and provide course developers and instructors with feedback based on the real uses of the learning resources particularly enabling the analysis of success indicators and indicators of dropout or failure.

Arising from the impetus of the VITAL project we developed this special edition of the CALL journal to acquire a snapshot of current research and practice in the field and to map out future research questions for practitioners and researchers in CALL. The special issue identified a range of potential themes, including analytics in online and offline language learning environments; analytics inside and outside the language classroom; analytics and adaptive language learning; analytics for formative assessment; the ethics of researching analytics in language education; the use of instructor and learner dashboards for language learning; sociocultural approaches to analytics in language learning; analytics in game-based and immersive language learning environments; instructor, learner and institutional resistance to the use of analytics; and preparing institutions (schools, colleges, higher education) for analytics.

The first article in the special edition, "Learning trajectories and the role of online courses in a language program", explores data about how students enrolled in a German programme at a North American university transition from online and offline courses against the background of increasingly popularity for online language learning and its potential for greater personalization. Schulze and Scholz analysed data from language courses that were offered on- and offline to explore how effective the students were at achieving their goals and academic success and to identify patterns in their behavior. A mixed methods approach

involving statistical analysis of learner data, biographical surveys and semi-structured interviews over a ten-year period provided an in-depth discussion of individual learning trajectories that was valuable for understanding students' curricular decisions.

In "Affordances and limitations of learning analytics for computer-assisted language learning: A case study of the VITAL project", Gelan et al focus on how learning analytics can provide valuable insights into task design for instructors and materials designers, as well as help students with effective learning strategies and personalised learning pathways. The paper is notable for situating analytics within the wider context of research on data-driven learning in computer-assisted language learning, prior to examining findings arising from the EU funded VITAL project, as mentioned above, with data from 285 undergraduate students on a Business French course at a university in Belgium. Based on a flipped classroom design and using an innovative approach to collecting data in the xAPI format, process-mining tools and data visualisation in the form of instructor and learner dashboards, enabled researchers to identify significant differences between successful and non-successful students' learner patterns.

Building on this work on data mining, in "Understanding online interaction in language MOOCs through learning analytics", Martín-Monje, Castrillo and Mañana-Rodríguez explored how the approach can help researchers to understand which learning objects students use, how successful students interact, and to identify examples of successful learner profiles. Findings highlighted the importance of video, automated grading activities, and the most prominent types of learner profile. They demonstrate that the data mining approach can help designers with respect to audio-visual content, and to produce content that leads to more well-rounded learners who do not merely view content, but actively engage in problem solving.

The importance of analytics for learning design is also evident in "Analytics in online and offline language learning environments: The role of learning design to understand student online engagement" in which Rienties et al sought to combine key principles of learning design, the use of big data and learning analytics to guide the process of course development. The study drew on a student activity based taxonomy adopted by the Open University in the UK for the learning design and collected data from 2,111 learners to investigate how learning design decisions made by language instructors affected the way students engaged with other students and activities in a virtual learning environment. Based on a quantitative analysis involving fixed effects models, it was evident that the way instructors designed weekly activities had a significant impact on online engagement. As a result, the study underlines the importance of big data to teachers and designers when attempting to understand how learners interact online.

The integration of face-to-face and online instruction is the focus of Rubio, Thomas, and Li's study on "The role of teaching presence and student participation in Spanish blended courses", which investigates how both approaches can work alongside one another in a mutually beneficial way. Using virtual learning environment data relating to student participation in the online part of the course, the researchers focus on the importance of active participation, passive participation and continuity. Findings indicate that profiling of online learners can help to identify less successful students and that there appears to be a correlation between lower levels of online participation and engagement and final grades in the course. The analytics were therefore able to help course designers and instructors in terms of course design and by identifying potentially at-risk learners.

The final contribution to the special edition, "Statistically-driven visualizations of student interactions with a French online course video" by Youngs, Prakash and Nugent explores the use of logged data from an online French course. While normally this data is not

available to instructors or students, the paper presents a quantitative visualization arising from students' interactions with a learning video and supplementary questions. The paper explores the potential of this type of approach as a way of delivering in-depth understanding of learner behavior.

Collectively the six papers in this first special edition on learning analytics and language learning present some fascinating data and findings about this emerging field. While there are other areas of analytics that provoke much concern and will require greater reflection (e.g. ethics, learner tracking and surveillance), it is hoped that the papers will inspire further research and identify some important research questions for others to take forward in future editions of the *Journal of Computer Assisted Language Learning*.