

EDITORIAL

by Antonio Marzano and Antonella Poce

Focus on: Learning Analytics: for A Dialogue between Teaching Practices and Educational Research

Learning Analytics is a new field of techniques widely used in a number of communities. Some of them are Statistics, Business Intelligence, Web analytics or Operational research. The use of the Analytics approaches in the context of the learning process is called Learning Analytics (LA). A widely accepted definition of LA, provided at the 2012 International Conference on Learning Analytics and Knowledge, describes the field as “*the measurement, collection, analysis and reporting of data about learners and their contexts, for the purpose of understanding and optimizing learning and the environments in which it occurs*” (Siemens & Baker, 2012). The rise of LA comes from the chance of observing and tracking the learners’ activities through log files. Logged data describes who the students are, which activities they carried out and when, and sometimes how and where, they worked. Such intensive data collection produces the so-called Big Data that facilitates the use of data analysis procedures (de-la-Fuente-Valentín *et al.*, 2015).

Non-intrusive measurement and collection is difficult to achieve in the learning context. The most popular method is to capture web interactions in a Learning Management System (LMS), but the captured data may not be fully representative of the student activities and other monitoring methods are required. Methods include social network analysis, collaborative filtering, clustering, neural networks, just to mention some. LA attempts to discover the factors that affect learning in a certain context, so that instructors and learners reflect on these factors and improve their experience.

LA will explore continuous monitoring of learner progresses and traces of skill development of individual learners as well as learning groups, both within and across programs and institutions. It will discuss issues concerning

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continuous evaluation of achievements resulting from institutional educational practices to gauge alignment with strategic plans and alignment of governmental strategies. It will examine assessment frameworks of academic productivity to continuously measure impact of teaching. It will discuss concerns such as quality of instruction, attrition, and measurement of curricular outcomes using big data and associated methods and techniques as the premise.

In this special issue, we have worked to publish research initiatives related to LA and really in line with its principles, its ideas and its goals.

The theme of L.A. is differently dealt, focusing on the use that such data can play to improve learning. Different contributions, in particular, are devoted to identify solutions that support both MOOCs and Open Resources' effectiveness in teaching and learning processes. **Fazlagic and Cecconi** discuss the topic, describing the characteristics of the case of the Eduopen platform from a qualitative point of view. The instance of the Eduopen platform is central also in the paper by **Dipace, Fazlagic and Minerva** to highlight how the process of innovation and redefinition of L.A is carried out in the dashboard of the platform itself. In such a setting, formative assessment to support learners in the completion of online courses is developed from different perspectives: **Marchisio et al.** describe how formative assessment can offer a more consistent use of OERs at different levels of teaching and learning; **Cecconi and Fazlagic** focus, then, on the quality and assessment tools used in the MOOCs at Unimore and on data on completion rates; **Fissore et al.** use L.A. to improve formative assessment strategies; **Palmiero and Cecconi** propose then an innovative model for assessment in combining formative and summative data with the information collected through the log files produced by the administration. **Miranda et al.** show how data can support both teachers and learners is the theme developed.

In the field of assessment through L.A, the paper by **Re et al.** describes a new tool to assess the complex construct of Critical Thinking, attempting also an automatization of the system never experienced before.

From a different angle, **Bellini et al.** offer a picture of how protection can be considered as far as data management is concerned. The definition of a new predictive model for completion rate in MOOCs is at the core of **De Santis et al.**'s contribution, raising the quality dimension, which is relevant also in the review study by **Agrusti et al.** where the focus is on how to use data to predict university drop out. Completing Agrusti et al.'s study, another review (by **Cadamuro et al.**), in the present issue, is devoted to deepen the relationship between ICT, metacognitive skills and learning outcomes. In general, the authors conclude that the interaction between ICT and metacognition in

producing better learning outcomes appears well established and the results highlight a bi-directional relationship between metacognition and ICT, but also allow to draw attention to gaps requiring further research. The definition of an agnostic monitoring system to use data in a more effective way is developed by **Fallani et al.** and how data driven modeling of engagement analytics can be helpful to assess student engagement and promote reflections on the quality of teaching and learning is central in **Yang's et al.**'s paper.

The paper by **Torsani** can be set too in a view of using information collected online as predictive tools, dealing with user rating as a predictor of linguistic feedback. A critical analysis of the quality of "question and answer" portals is at the core of his contribution.

Content and subject development is developed by the papers on creating videos resources to improve disciplinary skills by **Polo et al.**, where results of a trial, involving teachers and students from upper secondary in a social network context to inquire the interactive dimension of all the subjects involved, is presented. **Bucciarelli et al.** inquire the relation among mathematics, informatics, linguistics in the result of a strongly transdisciplinary domain. The contribution by **Cinganotto and Cuccurullo**, which investigates what impact can a MOOC on language awareness have on teacher's professional development, is set on very close topics.

The papers devoted either to introduce an instance of how to use different solutions and augmented reality, in particular, to improve learning in 3 to 6 year old pupils (**De Angelis et al.**), or describing the school setting climate are those embracing a learning perspective in the dimension of innovation (**Manna et al.**).

The contribution by **Sansone and Cesareni** prompts reflection on the possibilities of technological development of L.A. within the learning environment, such as to better support constructivist teaching: L.A. that comes closer to social L.A. techniques provides the teacher with a richer picture of the student's behavior and learning processes.

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