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LEARNING TO SWIM IN A DIGITAL OCEAN

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A BOOK REVIEW

Larusson, J., & White, B. (2014). *Learning Analytics: From Research to Practice.* New York: Springer.

Learning Analytics (LA) is a field of research which aims to answer questions such as: How effective is a given teaching course? Does it meet the current needs of the students? If not, how can the course be changed so that it does meet their needs? Which interactions are effective and how can they be improved? Is it possible to identify students who will need help later on at the beginning of a course? Naturally, questions like these can be answered, yet rarely is this possible without consulting their final marks at the end of the semester/academic year when it might already be too late.

When most courses are now online (or at least have online support), most needs and interactions such as these can be easily and immediately noted, collected, and analyzed so that the data can provide information about students, their environment, and the context in which their learning takes place. Each click, search, and status update on social networks, each interaction in the online environment, leaves a digital trace. This holds true even for online learning, computer teaching modules, online courses, and the storage of digital records of student marks. According to Duval (2012), LA occupies itself with collecting the digital traces which students leave behind and using them to improve teaching and learning.

The creation of LA was brought on by the digital era which we now inhabit. The reviewed publication examines in its introduction how Western society transitioned from a period in which digital technologies did not yet exist (or were minimally used) to its present digital stage. DiCerbo and Behrens (2014) liken the current stage of pedagogy to a digital ocean that was preceded by a digital desert in which pedagogy had much less information on the nature of ongoing processes in education, interactions between students, and the

degrees of effectiveness of teaching. In the era of the digital ocean, information on these matters can be collected without interrupting the students or stopping the learning process. Since the majority of schools are equipped with computers, it is not very difficult to have at least a part of teaching take place through computers and online courses. This seemingly subtle change allows the collection of a great deal of data on what exactly students are doing while in contact with electronic teaching materials. This type of information then leads to the creation of a digital ocean of data which can, if used properly, enable a different perspective on how students attain information, skills, and knowledge.

The first primer on LA which aims to impart information to researchers and teachers on how to swim in the digital ocean is *Learning Analytics: From Research to Practice* by Larusson and White (2014). It includes chapters by different authors who study LA. Larusson and White edited this publication and co-authored the last of its eight chapters. The diversity of the authors is on the one hand a benefit, as the publication covers many areas of LA, and on the other hand a disadvantage, as it might lead to certain inconsistencies. The latter is not the case of Larusson and White's *Learning Analytics*, which is a coherent publication. Nonetheless, it is a pity that none of the chapters is dedicated to the work of Long and Siemens, the pioneers of this research field, despite the many citations and references the publication includes. The book itself is divided into three parts and subdivided into individual chapters.

The first part, called *Preparing for Learning Analytics*, is dedicated to introducing LA and the necessary theoretical and practical groundwork. This part describes in detail the steps LA entails: data collection, measurement, and analysis; conveying of information to students and teachers; and, finally, prediction. In the same way that teaching cannot be measured, there is not a specific way to measure the effects of LA. Nonetheless, LA gives institutions the possibility to make use of existing data about their students, based on which they can calculate and create assumptions about the achievements of their students. This enables the institutions to act preventively at the beginning of the semester instead of at its end, which in turn allows the students to improve or completely change their learning approaches and strategies, thus influencing the results of a given institution. The publication emphasizes the need to focus more on understanding individual attributes that influence academic achievement than on the mere measurement, evaluation, and categorization of students. In this understanding, students are seen as collaborators rather than objects of study. Similarly, their achievements are seen as a dynamic entity variable and their success as a complex and multidimensional phenomenon. Finally, the authors stress that all data should be collected and interpreted transparently.

As for the notion of transparent interpretation, since LA involves work with sensitive data about students and their achievements, it is necessary to bear in mind the ethical side of working with such data. This raises several questions, such as: (i) are the students aware that data are collected about their achievements? (ii) what data exactly are used to predict and trace? (iii) who has access to such data? (iv) where and for how long are the data stored? (v) are students given all the information about their achievements or only a selected part while the rest is accessible to teachers? (vi) what should be done if students disagree with the collection of such sensitive data? Unfortunately, the publication provides no answers to these questions. Similarly, it does not specify the nature of demographic data, although it is mentioned several times in relation to LA, nor how such data can be used in prediction. One can only speculate if the justification for this omission lies in space limitation or elsewhere.

The second part of the publication, called *Learning Analytics for Learning Communities*, explains the basics of LA from the perspective of the relationship between students and teachers and also from the perspective of school institutions and the whole education system. As the subtitle of the publication suggests, the book does not focus solely on the theoretical. On the contrary, it includes examples from teaching practice, descriptions of how LA can be incorporated, and a list of software programs which can be used for the purposes of LA. One such program is *Student Explorer*, the aim of which is to forewarn about possible student failure; its descriptions comprise more or less the whole sixth chapter of the publication. The chapter includes a thorough description of the program, how it was used in a certain school, and the two phases of its implementation in the school. The publication describes how during the first phase teachers were instructed how to use the program and how it could be useful for their classes. The publication does not just describe the benefits of the program; it also mentions its drawbacks as pointed out by the teachers. The book then narrates how the program developers incorporated these suggestions and criticisms, created a new interface, and updated some of the functions of the program. It details how even after this phase the teachers still voiced minor criticisms along with reasons that they did not incorporate the program in their teaching. It is revealed that the program works with two groups of data about students: with their marks and continuous assessment and with their interaction in online support for the courses they take. The program specifically collects data on how often a student visits each part of the online support course, which online materials are viewed by the student, which are downloaded, and what their activities were and in which discussion forums.

These data were collected by *Student Explorer* on a weekly basis and the teacher had access to them both for individual students and for the whole

course. The aim of the program was to evaluate such data in order to identify students who experienced problems or were not likely to finish the course. In an attempt to make the usage of the program as intuitive as possible, the results of each student were color-coded and displayed to their teacher at the end of each week. Students in red were identified as likely to need immediate intervention, contact, help, and support from their teacher. Students in yellow achieved average results as a consequence of their average activity. Students in green achieved above-average results and were to be encouraged and praised so that they could maintain them. This color-coding was available to the students as well, which brought to light a possibly problematic side of such color-coding: when certain students realized that they were coded in red, they gave up rather than pressing on. Consequently, they did not finish the course if their teachers did not intervene (which was reported to be often the case). A question arises whether there is truly a need to save even half-drowned fishes in the digital ocean or whether their drowning is not simply part of the natural course, as I would suggest.

The final part of the book, called *Learning Analytics for Teachers and Learners*, is the most practical part. It includes many case studies of how LA is applied in various teaching environments. It transpires that LA might be most beneficial for lecturers and teachers as they can use it to find out in real time which parts of their teaching work and which do not. This in turn allows them to change their approach or materials throughout the semester. Lately, Intelligent Tutoring Systems have become useful for teaching great numbers of students as they work one to one and the real teacher is replaced with a program personalized for the needs of each student. The last chapter is dedicated to a specific field of LA which analyses the written words of students, either in the form of seminar papers or blogs related to teaching materials. Using LA, the teacher can trace the progress of students in their thinking, which is known as "the point of originality." This is done via a specific algorithm which evaluates how students create and paraphrase ideas. This is especially useful in cases where courses comprise a large number of students and it is therefore not possible for the instructor to achieve this individual evaluation for each student. In such situations, LA can be of great help to instructors and teachers, making the evaluation process more manageable. The reason for seeking the point of originality is in its correlation with the point of originality in written works of students, their activity on blogs, and their final mark. The publication details how students were assigned to create a short blog post on study materials which were also visible to other students. These students received feedback both from their teacher and from their peers. The results published in this chapter show that such blogging on study materials facilitates learning, improves marks achieved in courses, and brings about many other benefits. At the moment, this software is available

only for the analysis of texts written in English. However, since the digital ocean expands every day, it is only a matter of time before a version of the program is created for other languages as well.

A rather curious drawback of the publication is its representation of graphs and charts. Even though the publication is printed in black and white, the footnotes refer to color-differentiated data. Consequently, the interpretation of results is in many cases either impossible or incomprehensible. It would seem better to keep the original footnotes and print the publication in color or at least to use different shades or black and white and cross-hatching.

In conclusion, learning analytics is not a magical elixir that cures ineffective teaching or reveals the most appropriate pedagogic strategies. Instead it provides data-driven tools and tips for teachers who can make changes that influence student results. Consequently, *Learning Analytics: From Research to Practice* is a valuable introduction to the phenomenon of LA that may help us to swim in the digital ocean and perhaps even enjoy the process.

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[1] LA is close in nature to Educational Data Mining (EDM). Since it is difficult to specify the differences between these two types of research, both are often conflated into a single type. Nonetheless, because they are not completely identical (and some differences between them can be found), EDM is understood by some people to be a sister to LA.

[2] At present, LA is used to study students of upper secondary schools and universities (Elias, 2011).