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A Beginner's Guide to Learning Analytics

Springer

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Preface

Generally speaking, learning analytics refers to the collection and analysis of learner data and their environments to understand and improve learning outcomes. The most cited definition of *learning analytics* comes from the very first Learning Analytics and Knowledge Conference in 2011, where George Siemens and colleagues defined learning analytics as: "*the measurement, collection, analysis and reporting of data for learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs*."

A key turning point in the field was imperative to concentrate learning analytics on learning as a core element in its use and application. Since then, more has been done in research and practice in learning and teaching, improved our understanding of the student learning methods and performances, the effect and redesign of design in terms of learning, research, and implementation methodologies.

Learning analytics is where big data in education meets conventional quantitative approaches. Governments, colleges, testing organizations, and MOOC providers capture student data and their learning. However, until recently, when the methods and tools were built, all these data were largely unused. Many of the current data are not available in well-ordered, tidy, and collected formats. It occurs in various forms across networks and places. Analysts need the opportunity to access and process these data now, so we can better understand what students know and how they know it. Translating these data into information and eventually contributing to a better education are learning analytics and educational data mining.

The emphasis on "*understanding and optimizing learning*" where learning analytics departs from the educational data mining and more data-driven practice, a methodology with more important relations with learning theory, the learning design, and a more empirical, evidence-informed practice. A vital, ethical mindset is central to this process of integrating data into teaching and learning practice.

The book, *A Beginner's Guide to Learning Analytics*, is the culmination of decades of experience written by expert thought leaders to help educational institutions develop the culture of sustainable measurement and data-informed decision-making.

Organization of the Book

Chapter 1 provides an overview of learning analytics' evolving field, followed by a short overview of learning analytics' benefits and drawbacks. This chapter also discusses the various ethical and privacy problems involved.

Chapter 2 explores the connection between the two classes, namely LA and EDM. This chapter explores further the improved and official cooperation and collaboration between these two groups to share techniques, research, knowledge mining, and analytical tools to develop EDM and LA areas.

Chapter 3 focuses primarily on how organizations should prepare for learning analytics. How can they organize themselves to advance learning analytics and see the sustainable impacts of learning analytics across traditional services?

Chapter 4 presents and analyzes various data and data usage formats in the learning analytics context to select the best data model for use. This chapter also provides a report on data privacy problems in the learning analytics functions.

Chapter 5 is intended to provide an overview of popular learning analytics tools, including the criteria for selecting the appropriate tool and strategies to effectively develop a learning analytics tool. Eventually, this chapter also presents case studies on learning analytics tools in various educational institutions.

Chapter 6 presents various technologies, viz. big data analytics, data science, AI, ML, and DL, and how can these techniques be used to expand educational system capabilities. This chapter highlights how each technology advances learning analytics' capabilities for reforming higher education practices and helping instructors improve teaching and learning.

Chapter 7 focuses on integrating learning analytics into Massive Open Online Courses (MOOCs), addresses the major challenges of this integration, and examines its potential benefits and limitations.

Chapter 8 highlights the value of pedagogical systems focused on learning analytics and pedagogical intervention design for students to use learning analytics.

Chapter 9 adds remarkable contributions to learning analytics' research by furnishing a substantial and forward-looking view of learning analytics and its related developments and provides a promising path for the twenty-first century in this emerging field.

Chapter 10 explores the usage of learning analytics as recommender systems and in higher education. Additionally, it provides evidence for the use of learning analytics at various educational institutions.

Chapter 11 provides some practice problems to enhance your knowledge and further understand the concepts guided by this book.

The book is well researched and written comprehensively and compellingly, making this book a must-read for all learners, professionals, and teachers. It serves as a practical guide to sound learning analytics practice based on technology and real-world success stories.

Key Features of the Book:

- Clearly provides a basic understanding of the evolving field of learning analytics.
- Provides excellent content on establishing and maintaining learning analytics alignment with various emerging technologies, viz. big data analytics, data science, artificial intelligence, machine learning, and deep learning.
- Gives practical advice for building a solid foundation for your measurement strategy by providing an overview of popular learning analytics tools.
- Analyses various data and data usage formats to ensure that you use the data you gather to improve learning outcomes.
- The content applies not only to readers but also to trainers and practitioners who want to build analytics capability beyond learning, too.

This book is really intended for readers who have no prior knowledge in learning analytics. The book functions as an introductory text to learning analytics for those who want to do more with evaluation/assessment in their organizations. It is useful to all who need to evaluate their learning and teaching strategies. It covers the key concepts linked to learning analytics for researchers and practitioners interested in learning analytics. This book helps those who want to apply analytics to learning and development programs. This book helps educational institutions to identify learners who require support and provide a more personalized learning experience.

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