Reviews

Cody Dingsen. (2025). Regression and Machine Learning for Education Sciences Using R. New York: Routledge. 376 pp. ISBN: 978-10-32510-08-8

In the evolving landscape of educational research, the integration of robust statistical methods and machine learning techniques has become indispensable for uncovering insights that drive more effective teaching strategies and learning outcomes. Cody Dingsen's Regression and Machine Learning for Education Sciences Using R serves as an invaluable resource for those looking to understand the intersection of educational research and data analytics. Aimed primarily at students and practitioners within the fields of education and psychology, the book offers a clear, methodical exploration of regression analysis and machine learning techniques tailored for educational data.

The book is a comprehensive resource, systematically organized into two main parts covering a total of 14 chapters, each building progressively upon the last. This layout is strategically designed to guide readers from basic to advanced concepts in statistical analysis and machine learning within the context of educational sciences. The Introduction sets the stage for the book by equipping readers with a fundamental understanding of R and R Studio. This chapter is crucial as it ensures that all readers, regardless of prior exposure to programming, start on equal footing with the basics of data entry, manipulation, and preliminary analysis in R.

In Part 1, the text delves into the core of regression analysis. Starting with simple regression analysis (Chapter 1), the book establishes a foundational knowledge that is essential for tackling more complex models. The progression to multiple regression analysis (Chapter 2) introduces readers to the intricacies of dealing with multiple predictors and the potential issues of multicollinearity and partial correlations, which are vital for robust data analysis in any research setting. The exploration of interaction effects in regression (Chapter 3) and the subsequent discussion on the assumptions underlying regression models (Chapter 4) deepen the reader's understanding of the conditions necessary for the validity of these models. The following

section of this part culminates with an examination of non-linear relationships through curvilinear and robust regression techniques (Chapter 5), expanding the toolkit for researchers dealing with non-standard data scenarios. The discussion transitions smoothly into logistic regression models (Chapter 6), which are particularly relevant for categorical data analysis, a common scenario in education research involving binary or ordinal outcomes.

Part 2 shifts focus towards machine learning, starting with an overview that contextualizes its importance against the backdrop of big data (Chapter 7). The subsequent detailed walkthrough of the machine learning process (Chapter 8) from data collection to model application, underscores the critical stages of building predictive models. As machine learning models grow in complexity, the need for regularization to prevent overfitting is introduced (Chapter 9). This chapter is particularly important as it bridges traditional statistical methods with modern machine learning techniques, providing a practical approach to handling high-dimensional data. The discussions on ensemble methods using random forests (Chapter 10) and the principles behind support vector machines (Chapter 11) offer advanced strategies for improving model accuracy and handling various data types, from continuous to categorical. A fascinating foray into artificial neural networks (Chapter 12) provides readers with insights into the more sophisticated aspects of machine learning that mimic human cognitive processes. This is complemented by an exploration of Bayesian networks (Chapter 13), which are presented as tools for uncovering causal relationships, a critical aspect in educational research aiming to derive actionable insights from observational data. Finally, the book concludes with a chapter on multivariate data visualization (Chapter 14), highlighting the importance of visual techniques like MDS (multidimensional scaling) preference plots for revealing patterns in complex data sets. This chapter not only encapsulates the analytical journey through regression and machine learning but also emphasizes the crucial role of effectively communicating findings. Taken together, Dingsen's book serves as both a textbook and a practical guide, carefully threading theoretical concepts with real-world applications. Each chapter (reflected upon here in sequence from Introduction to Chapter 14) builds upon the previous, crafting a narrative that is both educational and immensely applicable for researchers and practitioners

in the field of education sciences.

This book emerges as a pivotal resource in the landscape of educational research, illustrating a seamless blend of comprehensive coverage, practical applications, and accessibility that makes it especially valuable for both students and practitioners in educational sciences and psychology. The book's structure and content strategically guide readers through the complexities of regression analysis and machine learning, demonstrating Dingsen's deep understanding of both the subject matter and the needs of his audience.

The book is distinguished by its thorough exploration of a wide array of statistical techniques, ranging from fundamental regression models to sophisticated machine learning algorithms. This comprehensive approach is meticulously designed to ensure a cohesive progression, starting from simple linear and logistic regression models that form the analytical backbone for many educational studies, advancing through to more complex procedures such as curvilinear regressions and sophisticated ensemble methods like random forests and neural networks. Such depth ensures that readers gain not only the theoretical knowledge necessary to understand these techniques but also the practical skills to apply them effectively in their research endeavors.

Another major strength of Dingsen's work is its strong applications-oriented approach. Each chapter is anchored in real-world educational research scenarios, enhancing the practical relevance of the statistical methods discussed. This is complemented using R and R Studio, providing readers with hands-on experience in applying these techniques directly to data. This practical component is critical as it bridges the gap between theoretical statistical concepts and their application in real educational settings, thereby enhancing the learning experience and applicability of the content.

Moreover, the book excels in its clarity and accessibility, making sophisticated statistical content comprehensible for readers with varying levels of prior exposure to statistics. Dingsen's articulate and approachable writing style, coupled with his methodical breakdown of complex concepts and the strategic use of educational examples, makes the book an invaluable learning tool. This accessibility not only demystifies advanced statistical procedures but also ensures that readers are engaged and able to apply what they learn in practical settings.

Finally, the multidisciplinary appeal of this book broadens its usefulness beyond the primary fields of education and psychology. Its clear explanations and comprehensive coverage of essential data analysis techniques make it a beneficial resource for a wide array of disciplines that deal with data analysis and require robust methodological approaches.

While the book offers a comprehensive introduction to statistical methods within educational contexts, its specificity to educational datasets may limit its direct applicability to other fields where data dynamics can differ markedly. Secondly, the book primarily utilizes R and R Studio, which might pose a challenge for readers accustomed to other statistical software, potentially necessitating additional resources to translate these skills. Additionally, the progression from foundational concepts to advanced machine learning techniques, although well-structured, may be brisk for readers with limited statistical backgrounds, potentially requiring supplemental learning to fully grasp more complex topics. Despite these limitations, the book remains an invaluable resource for its intended audience, providing robust insights and practical applications tailored to educational research.

All in all, Regression and Machine Learning for Education Sciences Using R is a comprehensive guide that responds to the growing need for advanced analytical skills in the education sector. By demystifying complex regression and machine learning techniques and emphasizing a hands-on approach to learning, Dingsen's book is an essential resource for anyone looking to enhance their research capabilities and impact in the field of education. Whether you are a student new to data science or a seasoned educator/researcher seeking to update your analytical tools, this book offers the insights and practical guidance needed to navigate the complexities of modern educational research.

Zilong Zhong

Jover, G. González, Mª. R. González-Marín y Serrano, L. (2025). Pensamiento crítico, redes sociales y educación. Madrid: Síntesis, 196 pp. ISBN: 978-84-1357-401-1

In Critical Thinking, Social Media and Education, the authors offer a broad, in-depth and up-to-date look at one of the greatest challenges facing contemporary society: how to educate citizens to think critically in an environment dominated by digital platforms that shape the way we inform ourselves, communicate and interact. It is simply a matter of understanding the cultural, technological and cognitive changes implicit in the digital age, and how these changes force us to rethink educational practices.

Overall, the book presents a coherent structure that moves from the theoretical to the practical, from the philosophical to the empirical, from the individual to the social and political. Its greatest strength lies in the plurality of perspectives: philosophy, pedagogy, psychology, sociology, communication, law, and technology are integrated to offer a holistic view of critical thinking in the digital age.

In terms of its target audience, the book is particularly useful for teachers at any educational level, as it provides solid theoretical foundations and practical examples of application. It is also valuable for researchers in education, communication, or social sciences interested in the relationship between young people and technology. Educational policy makers, institutional leaders and teacher trainers will find in this work a rigorous framework for developing media literacy and digital critical thinking programmes. Finally, it can be an inspiring read for university students, especially those studying education, pedagogy, psychology, communication and social sciences, as it allows them to critically understand their own relationship with social media.

In the first two chapters, the work opens with a conceptual basis that links critical thinking, social media, and education. It recognises the ambivalence of digital platforms: they enable participation and expression, but they also amplify manipulation, polarisation, and superficiality. School emerges as a key space for equipping students with cognitive and ethical tools that enable them to navigate this information-saturated environment without falling into technophobic or techno-utopian views.

On this basis, a historical overview of critical thinking is provided, from classical philosophy to its configuration as a cross-cutting competence. The great conceptual leap consists of distinguishing between traditional critical thinking and digital critical thinking. In digital environments, variables such as speed, emotionality, algorithms and anonymity come into play, requiring the integration of cognitive, emotional, ethical and civic dimensions. Likewise, the need for in-depth media literacy and a democratic ethos that allows resistance to manipulation and polarising discourses is highlighted.

It then goes on to analyse the university as a strategic actor. Digital competence is redefined beyond the instrumental, incorporating cultural, social and ethical dimensions. The myth of the "digital native" is debunked, showing that intensive use does not equate to critical use. Media literacy models geared towards participation are presented, and it is emphasised that the development of students' critical digital thinking depends largely on teacher training. The university is conceived as a driver for cultural change in the digital society.

Chapter 4 delves into the validation of an instrument for assessing young people's self-perception of digital critical thinking. It provides methodological rigour and offers teachers and researchers a concrete tool for diagnosing and reflecting on how students analyse, question and evaluate the information they consume and share.

The fifth chapter introduces a psychological and social approach to understanding how users construct their identity on social media. Using personality models (Cattell, Big Five, IBM, Symanto, etc.), it analyses how online image is projected and how self-representation is regulated. The key point is that self-reflection on digital identity is interpreted as a form of critical thinking.

The book then focuses on the usage habits of Twitter, now X, among different generations through quantitative and qualitative analysis. The authors detect differences not only in activity and shared content, but also in the way of thinking through the platform. They pose a key question: do networks shape critical thinking, or does critical thinking determine the use of networks? Tensions arise between superficiality and depth, speed of information and the search for reliable sources.

After this analysis, the work introduces us to the ethical and axiological dimension. Based on the Hall-Tonna model, it explores how the values and counter-values of Generation Z manifest themselves on social media. It reveals a coexistence of collaboration and inclusion versus egocentrism or intolerance. And it dismantles the simplistic idea that young people are uncritical: context, role models and participation have a huge influence.

Chapters 8 and 9 focus on the institutional and political arena, first addressing the right to digital civic education as a response to electoral disinformation. They outline how fake news threatens democracy and propose educational strategies and international regulatory frameworks to strengthen critical and empowered citizenship. They then delve deeper into digital political communication through 'the three Ps': sentimentalisation, polarisation and populism. It examines how algorithms enhance emotional content and simplify debate, eroding rational deliberation. This part is one of the most powerful in the book, connecting critical thinking, politics, ethics and technology.

Finally, the book closes with a socio-technological look at the crisis at Twitter following its purchase by Elon Musk. It analyses user reactions, changes in reputation and alterations to the information ecosystem. Beyond the specific case, it reflects on the fragility of critical thinking when digital spaces change their rules. Twitter is shown to be a tool for both protest and participation, as well as risk and manipulation.

In short, Critical Thinking, Social Media and Education is a necessary and timely work that provides a broad, in-depth and proactive vision of one of the key challenges of the 21st century. It brings together theory, research, practice and ethical reflection around a single idea: educating citizens to think critically in the digital society is not optional, it is an educational and democratic imperative. Its balance between rigour and accessibility makes it a valuable tool for both academia and educational practice, offering keys to understanding the complexity of networks, young people and education in the digital age.

Mario Cerezo-Pizarro

García-Pérez Calabuig, M. (2025, Dir.). Artificial Intelligence and other demons in education. Dykinson. ISBN: 979-13-7006-305-4

The book titled *Artificial Intelligence and other demons in education* coordinated by Maria García-Pérez Calabuig of the National Distance Education University (UNED), presents a compilation of reflective discussions about how Artificial Intelligence (hereinafter AI), has burst into our daily lives and routines, achieving a notable prominence in educational activities. Its six chapters highlight some of the challenges we face from an ethical perspective, current regulations and issues related to digital competence, and other demons (digital stigma, the digital divide, dysfunctional uses and risks). The book begins with a prologue that arises some questions that lay the foundations for the subsequent discourse. Will AI shake up the education system? Are education and its mechanisms (teachers, students, administrators, families) trained to receive it? In fact, it has already arrived without us realizing….

In the first chapter, Suárez-Guerrero and Kuhn confront the reader with several revealing ideas. They argue that AI changes our perception of reality and offers us new supports for thinking. We do not think through it but with it, generating an inescapable relational binomial in which the human commitment is the key, mainly in the educational context. We start from the conception that, "although machines are programmed, they progress because of the human feedback and only makes sense in interaction with people" (Mancuso, 2024, p. 192). The metaphor of IA is drawn from the reinvention of the human being as the backbone, generating greater opportunities within teaching and learning processes and with greater social impact. AI not only allows us to generate new ways of thinking about the word but also create new challenges for education.

Following this reflection, the second chapter addresses an issue that complements the metaphorical and conceptual discourse of AI. In terms of equality, what biases are been generated by the technological revolution associated with AI? Is AI inclusive or can it contribute to magnifying the digital stigma of certain groups? In the infinity of cyberspace, it is assumed that digital rights exist and protect human beings in the same way as outside

the virtual world. The authors discuss the presence of digital stigma (e.g., the excessive profusion of the hate speech) as a form of discrimination that threatens certain vulnerable groups, questioning the need for a regulating framework that control its limits and effects. Against, early digital literacy contributes to educate to responsible citizens as its uses as the consequences and impact on themselves and others.

Based on that, Nieto-Márquez and Moraleda-Ruano addresses in the third chapter the skills that intertwine the teaching role in virtual environment and how AI emerges as a useful and applicable tool to catalyse and support teaching processes. The teaching competency framework is built around three areas: i) data management, content creation and materials competences; ii) pedagogical, collaborative and professional development competences; and iii) ethical and digital responsibility competences. Digital technology, and AI in particular, has brought about an unavoidable transformation in teaching performance, forcing us to rethink how technology is an integral part of education and how to link pedagogical practice with students.

The other side of the argument highlights the challenges and the influence of AI on teacher well-being. In the fourth chapter, the authors analyse the impact on teachers, emphasising cognitive overload and the pressure to constantly readjust to new advances without time for reflection. Well-being encompasses different dimensions which, in the best of cases, translate into life satisfaction, emotional balance and the ability to manage stress. On the contrary, although AI seems to mitigate teacher workout overload (Ortega et al., 2025), it can also contribute to infoxication and overshadow human interaction, calling into question the well-being of teachers in the digital century.

What about the ethical issue? Hueso and Vasco go deep into the ethical challenges of AI and education. They invite to a critical discussion in which, without demonising technology, draws our attention to this dark side of the balance. Some basic ethical principles are described related with justice and equity (avoiding the reproduction of stereotypes of social exclusion), the principle of transparency and explainability, and the principle of privacy and security. In the educational context, these principles take on greater meaning, together with the challenge of data protection and the dehumanisation of

processes due to the widespread, disjointed and exclusionary use of AI.

Maybe, on the demons in the virtual space are the multiple risks in which minors, adolescents and young people are exposed by their daily connectivity. In this latest contribution, Giménez-Gualdo, Ríos-Ariza and Rumuche-Chávarry show current data of FOMO (fear of missing out) among university students as one of the examples of many risks associated with the dysfunctional use of ICT.

In a hyperconnected world, where space-time boundaries are almost invisible and the frontier between human and AI is blurring, this book invites us to reflect on the balance between lights and shadows of AI and education. At the mercy of "God's nad and Adam", the educational, technological and digital landscapes make a triad of necessary understanding. A bond that requires us to stop, reflect and question ourselves about ethical limits and healthy disconnection to experience digital well-being towards a world more balanced between humans and technology.

References

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