

Ruiz Martín, H. (2024). *How do we learn? A scientific approach to learning and teaching (evidence-based education)*. Jossey-Bass.

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Simply put, learning occurs in the learner's brain. In the ever-evolving landscape of education, students are the primary agents of learning; however, when it comes to the kinds of knowledge and skills offered in schools, teaching is the most effective method of facilitating learning. Therefore, understanding the intricacies of how students learn is paramount for educators seeking to improve the effectiveness of teaching.

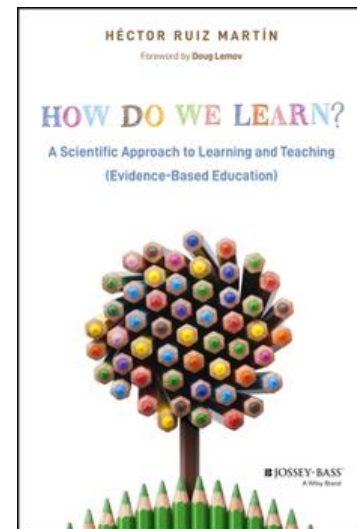
Undoubtedly, teaching has a scientific aspect, but we have scarcely developed and transferred it into the classroom. In recent decades, science has significantly enhanced our understanding of the learning process at both neural and psychological levels, yet little attention has been paid to the application of cognitive science in the teaching process. The process of learning is fundamental to human development, yet the science behind how we learn and teach effectively remains underutilized in the classroom. Héctor Ruiz Martín's *How Do We Learn?* focuses on the processes of teaching and learning, which happens inside classrooms and is, to a greater or lesser extent, in the hands of both students and teachers.

Ruiz Martín serves as the director of the International Science Teaching Foundation and has dedicated more than two decades to researching cognitive psychology, memory, and learning. His work has focused successfully on translating scientific findings into actionable educational resources, making him a credible authority in the field of learning sciences. His previous publications, e.g., *Learning to Learn by Knowing Your Brain: A Guide for Students*, have been well-received, establishing his reputation as a thought leader in educational research.

This book aligns with other educational works, such as DiPietro, Ambrose, and Bridges, *How Learning Works: Seven Research-Based Principles for Smart Teaching* (2010). However, it distinguishes itself by its stronger focus on cognitive psychology and its direct connection to classroom strategies. Ruiz Martín offers an insightful exploration of how both classic and emerging findings can transform teaching practices by leveraging the innate structures of the human brain. Written in a clear and accessible style, it delves into the cognitive mechanisms that govern learning and memory.

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Additionally, the author explores the socio-emotional influences that play a critical role in shaping students' motivation and performance. He delves into the fundamental principles of effective teaching methods, analyzing specific variables that enhance their efficacy based on our understanding of the human learning processes. By examining both established and emerging research, the book offers insights into how educators can align their pedagogical approaches with the cognitive mechanisms that facilitate students' learning.

Ruiz Martín's book distinguishes itself from others by rooting its guidance in rigorous scientific evidence rather than anecdotal or intuitive teaching practices. Central to its argument is the premise that effective learning stems not from rote activity but from "learning by thinking." (Chapter 1) This reconceptualization of active learning challenges the traditional view that equates student activity with meaningful engagement. Instead, the book emphasizes the importance of deep cognitive processes, such as connecting new information to prior knowledge and reflecting on its implications. He also emphasizes that while science cannot establish educational objectives—decisions that individual educational communities must make—it plays a crucial role in identifying effective methods to achieve those goals. The book focuses on how students can attain meaningful, enduring, and transferable learning across various disciplines, as well as how they can enhance their academic performance. It validates the effectiveness of certain long-standing educational practices and introduces new strategies to improve teaching and learning.

The book is organized into five sections, methodically guiding the reader from foundational concepts to practical applications. The opening chapters explore how the scientific method aids decision-making in teaching and learning. The author emphasizes the importance of avoiding cognitive biases and highlights the role of empirical evidence in evaluating educational strategies. He elucidates the methodologies employed in research on teaching and learning processes, highlighting the unique insights these studies offer to inform daily decisions made by both educators and students. He also discusses the nature and limitations of scientific knowledge, particularly within the complex field of education, and underscores the importance of interpreting research findings with caution and critical thinking. Chapter Two delves into the mechanics of memory and learning. Martín explains the interplay between sensory memory, working memory, and long-term memory, offering insights into how educators can reduce cognitive overload and promote meaningful learning. Chapter Three highlights the critical role of emotions, motivation, and beliefs in the learning process. Emotions are automatic behavioral, physiological, and psychological responses of our body to certain external or internal stimuli that are perceived as a threat or an opportunity (Shuman & Scherer, 2015). Using insights from self-determination theory, Ruiz Martín discusses how fostering autonomy, competence, and a sense of belonging can significantly increase student engagement and academic performance.

In Chapter Four, Ruiz Martín explores the concept of metacognition and the importance of students taking an active role in their learning. By focusing on self-regulation skills, the author provides actionable strategies that educators can use to help students develop the ability to plan, monitor, and assess their own learning. Chapter Five discusses the practical application of these scientific principles in teaching. The author covers effective instructional strategies, the role of feedback in learning, and the importance of assessment that is aligned with the learning objectives, ultimately providing educators with a comprehensive guide to enhancing their classroom practices. In the appendix, Ruiz Martín critically examines popular

misconceptions in the education field. He cautions educators against adopting methods that lack scientific validation, emphasizing the importance of evidence-based practices to prevent the misallocation of resources. This section underscores the necessity for critical thinking in educational practices, encouraging educators to base their teaching strategies on scientifically supported principles.

Ruiz Martín is to be commended for the depth and accessibility of his text. He adeptly translates complex cognitive theories into practical strategies that educators can readily implement. His clear and concise writing make this book accessible for both researchers and practitioners. One of the book's strongest points is its critique of widely accepted but scientifically unsupported education theories, such as the “learning styles theory” and the “left-brain/right-brain theory.” Ruiz Martín effectively challenges these theories and encourages educators to adopt evidence-based teaching methods. This critical perspective adds depth to the book and makes it an essential resource for educators seeking to refine their practices. Additionally, the book is highly relevant to contemporary education issues. By addressing the social and emotional factors that impact learning, Ruiz Martín provides a well-rounded understanding of the factors influencing academic success beyond just cognitive strategies. The book's strengths lie in its comprehensive coverage of the learning process, its evidence-based approach, and its practical applicability. The author's ability to distill complex research into actionable insights is particularly valuable for educators seeking to enhance their teaching practices. The inclusion of real-world examples and case studies further enriches the content, making the theoretical concepts more tangible and relatable.

While the book is an excellent resource for educators, its applicability may be somewhat limited. Many of the findings are situated in Western educational settings, which might not fully address the diverse challenges faced by educators in other parts of the world. Further, while Ruiz Martín offers concrete strategies for improving teaching, some readers may find it difficult to put them into practice in classrooms that have insufficient teaching resources or support systems. Moreover, while the book aims to help teachers base their decisions on scientific models, it acknowledges that the transfer of scientific theory into practice in educational settings is neither straightforward nor direct. Teachers must consider their students' individual needs and the specific educational context, which can complicate the practical application of these models and suggestions. Therefore, while the book makes important contributions to educational theory, its limitations lie in translating these theories effectively into diverse classroom environments.

This book is a valuable resource for educators, curriculum designers, and educational administrators, providing practical guidance on applying research findings to teaching practices. By understanding the scientific principles of learning, educators can more effectively support students' academic achievements and overall development. By integrating scientific rigor with practical strategies, the author's approach offers educators a valuable resource to better understand and enhance their teaching methods. Its balance between theory and practice makes it a must-read for all educators. It presents a rigorous scientific analysis, articulated in comprehensible language and translated into pragmatic actionable steps. In the final analysis, this book will be of use to teachers and students, as well as to all people interested in discovering how learning works. After all, the journey of becoming a learner is an ongoing process.

Notes

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About the Reviewers

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