

# INTRODUCTION



**Research integrity**

In the ever-evolving landscape of scientific inquiry and technological advancement, research integrity stands as a cornerstone of credible and impactful knowledge generation. As scholars, scientists, and professionals, the adherence to ethical principles and the commitment to honest and transparent practices are paramount to ensuring the validity and reliability of research outcomes. This introduction aims to underscore the critical importance of research integrity, highlighting its role in fostering trust, advancing knowledge, and driving societal progress.

#### *The Foundation of Trust.*

Research integrity is fundamentally about trust. The scientific community, policymakers, and the public rely on the accuracy and honesty of research findings to make informed decisions. When researchers uphold high standards of integrity, they contribute to a culture of trust essential for advancing science. Conversely, breaches of integrity, such as data fabrication, plagiarism, or falsification, can have far-reaching consequences, eroding public confidence and undermining the credibility of scientific institutions.

#### *Advancing Knowledge.*

Pursuing knowledge is a cumulative process, building on previous discoveries to push the boundaries of what is known. Research integrity ensures that this process is robust and reliable. By rigorously adhering to ethical standards, researchers produce findings that others can replicate and build upon. This cumulative nature of scientific progress depends on the integrity of each contribution, making it essential that researchers conduct their work with the utmost honesty and transparency.

#### *Driving Societal Progress.*

Research plays a pivotal role in addressing some of society's most pressing challenges, from health crises and environmental issues to technological innovations and social policies. The integrity of research impacts the effectiveness and applicability of solutions derived from scientific inquiry. When research is conducted with integrity, the resulting knowledge can be confidently used to inform policies, create innovations, and improve lives. This fact underscores the broader societal implications of maintaining high standards of research integrity.

#### *Ethical Responsibility.*

Beyond the practical benefits, research integrity is an ethical responsibility. Researchers have a duty to conduct their work in a manner that respects the principles of honesty, fairness, and accountability. This responsibility extends to their peers, participants, and the broader society supporting and benefiting from scientific research. Upholding research integrity reflects a commitment to these ethical principles, reinforcing the moral foundation of the scientific enterprise.

### *Promoting a Culture of Integrity.*

Fostering a culture of integrity within the research community involves education, transparency, and accountability. Institutions must provide training and resources to help researchers understand and implement ethical practices. Additionally, transparency in research methods, data sharing, and publication processes can enhance accountability and reduce opportunities for misconduct. Creating an environment where ethical conduct is valued and supported is crucial for sustaining research integrity.

Research integrity is indispensable to scientific research's credibility, reliability, and impact. It underpins the trust between researchers and society, supports the cumulative nature of knowledge, and ensures that research findings can effectively address societal challenges. As we continue to explore new frontiers of knowledge, maintaining a steadfast commitment to research integrity is essential for fostering a culture of trust, advancing science, and contributing to the betterment of society.

In this book, the authors have attempted to highlight the main aspects of research integrity for scientists through algorithms, illustrations, and brief comments. Understanding that it would be complicated to cover all the material dedicated to research integrity in this manner, the authors did not set such a goal for themselves.

So why create a book with pictures that don't describe everything in exhaustive detail? The answer to this question is simple. Or rather, there are at least two answers. First, a young researcher should have "theses" about research integrity to refer to for a detailed study of the necessary elements at any time. These "theses" can be easily grasped thanks to the illustrative material and brief explanations provided. Second: Are you familiar with the graph shown below?

The Dunning-Kruger effect and the "impostor syndrome" are phenomena that a "scientific freshman" should acquaint themselves with during their first decisive steps into science. This book, in a light and easy manner, will help you overcome the dangerous peak of the false "I know everything" and shorten the time spent traversing the "valley of death" or the "valley of despair" known as "I know nothing." Finally, you will reach the "plateau of stability," and all the information you have received will help you avoid the "impostor effect," as true impostors in science, like butterflies, have short lifespans and quickly disappear with their pseudoscientific "teachings" under the pressure of the principles of verification and falsification to which science adheres.



<https://www.trainingpeaks.com/coach-blog/where-are-you-on-the-dunning-kruger-wiggle/> (accessed on May 1, 2024)

You will also find practical cases with examples of their implementation, dedicated to various stages of your scientific research from the perspective of ensuring research integrity, to be of interest.

This book can simultaneously serve as a lecture summary for the reader, as it is structured in such a way that a part of the page is allocated for notes next to each illustration, diagram, case study, and self-assessment task.

The reader can get a brief overview of each book's section by watching a video that uses avatar technology.

This is the first version of the book. The authors plan to improve this version and release subsequent modifications, which will consider modern science's challenges in ensuring research integrity, as well as criticism and suggestions from experienced and young scientists as an element of open review.

While preparing the materials, sources listed in the core text were used. To make the material easier to read in one go, the authors noted references to individual illustrative materials of a popular science (and in some cases even humorous) nature and deliberately allowed "poor academic quality," not citing primary sources to improve readability.