



Lecture 3:

Quality control & peer-review

Course 501

Writing and Communication Skills

AIMS

- Understand the how ideas are evaluated and communicated with a quality control.
- Understand the process of peer-review and publishing of scientific articles.



What is the quality control of knowledge
production?

"Lively and provocative . . . Mr. Hawking clearly possesses a natural teacher's gifts—easy, good-natured humor and an ability to illustrate highly complex propositions with analogies plucked from daily life." —*The New York Times*

In Stephen Hawking's landmark #1 *New York Times* bestseller—now updated with a new introduction and six short essays on the current science—one of today's greatest scientific minds explores such profound questions as: How did the universe begin—and what made its start possible? Does time always flow forward? Is the universe unending—or are there boundaries? Are there other dimensions in space? What will happen when it all ends?

Told in language we all can understand, *A Brief History of Time* plunges into the exotic realms of black holes and quarks, of antimatter and "arrows of time," of the big bang and a bigger God—where the possibilities are wondrous and unexpected. With exciting images and profound imagination, Stephen Hawking brings us closer to the ultimate secrets at the very heart of creation.

"Even as he sits helpless in his wheelchair, his mind seems to soar ever more brilliantly across the vastness of space and time to unlock the secrets of the universe." —*Time*

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SCIENCE

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Mostly in humanities subjects

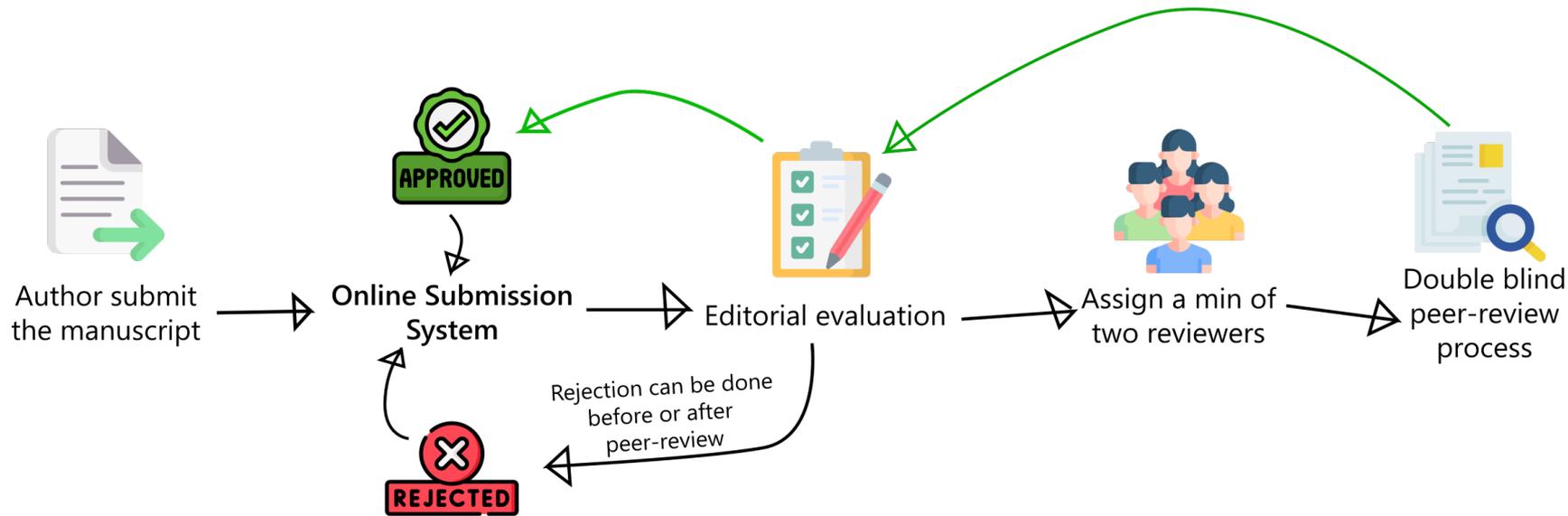
What about the sciences?

Peer-Review!





What is peer-reviewing?





What is the hierarchy of written
communication?

The journey of a small discovery in written
literature



Example Author Manuscript Title

Example Author One^{a,*}, Example Author Two^{b,2}, Example Author Three^{c,3,4,5}

^aY. Z. Institute of Example, Example Branch, Academy of Sciences, 660036 City, Country

^bA.B. University of Example, IEA, B-12345 City, Country

^cABC-DEF-HIJ, c/o Institute Sample, 1 Sample street, City, Country E.G. 12, 1234

ABSTRACT

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Introduction

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Primary literature

Peer-reviewed
scientific articles





attention to detail

A large magnifying glass with a black handle and a silver rim is positioned over the word "attention" in the main title, focusing on the letter 'i'.

Primary literature

Peer-reviewed
scientific articles

**Citations
and
References**





Writing a review article: what to do with my literature review

Cite this: *Chem. Educ. Res. Pract.*, 2021, 22, 561

Nicole Graulich,^a Scott E. Lewis,^b Ajda Kahveci,^c James M. Nyachwaya^d and Gwendolyn A. Lawrie^{d,*e}

DOI: 10.1039/d1rp90006d

rsc.li/cerp

Introduction

Science education and chemistry education articles have proliferated in the last two decades. For researchers new to the field, it can be hard to get an overview about a research area, for example what has been studied and general trends over time. This increases both the importance of, and the demand for, review articles. This type of article is typically based on already published work and is meant to summarize and collate available studies about a research topic. Reviews play an integrative role in synthesizing the body of literature under a thematic umbrella. A reviewing lens on published work can integrate and outline state-of-the-art research in a field, provide a discussion of controversies and inconsistencies in prior research, evaluate existing methodological approaches or possibly propose future research endeavors. Some review articles adopt a more quantitative effects estimation approach, whereas others are more narrative, seeking to

synthesize qualitative findings. Not every individual review article can cover all of these potential objectives.

Review articles allow the readers to get a landscape view of a topic, but readers can also use the collection of references cited in a review article to dig deeper into a topic. Thus, they are valuable resources to consult. Well written review articles are often highly cited and could increase the visibility and reputation of the authors.

Decisions to make before starting to write a review article

Before starting to write a review article, it is helpful to clarify whether, especially for researchers early in their careers, review articles count towards their promotion or tenure benchmarks. Depending on the country or requirements, articles reporting original research work can have higher value than review articles for these processes. If tenure requirements are related to citation indices, a review article is probably worth the investment of time. Making this decision about writing a review article or not should be guided by this economic lens, as a well-written and well-researched review article can be very time-consuming. Time might be considered to be precious when just having started an academic position.

It might be tempting to consider adapting a literature review, that is part

of an article, proposal or dissertation, into a published review article. Such a literature review can be used as a starting point to build a review article upon. However, a literature review often does not follow the quality criteria of a formal review article or specific types of reviews and therefore should be reworked based on the steps illustrated in this editorial.

Types of review articles suitable for chemistry education research and practice

The denomination of review types can vary depending on the field and on the resources used. This editorial does not encompass all types of review articles that are possible, but we endeavor to list and further explain the main types of review articles. *Chemistry Education Research and Practice* publishes three manuscript types: (1) original research articles, (2) perspectives and (3) review articles. The latter category includes narrative, integrative or systematic reviews and meta-analyses. Perspectives serve a different purpose than review articles, although like review articles perspectives should also be based on, or discuss, published research. Review articles need to align with the goals and scope of the journal. Thought experiments outlining a theoretical position or personal opinion without including a literature basis,

Secondary literature Review articles

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ideas

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Citations and References



Programming Examples

In the previous chapter, we presented the theory of the two basic programming constructs of imperative programming, namely sequencing and loops. This chapter is entirely devoted to the study of examples dealing with such constructs.

In section 10.1, we present a general paradigm for computing the minimum of a non-empty set of natural numbers. From that single example, we derive a large number of special cases. It seems that this search for a minimum could have been extended to other inductive structures. We have not tried to do so, however, in this book.

In the next three sections, we present general paradigms for computing recursive functions constructed on certain inductively defined sets, namely natural numbers (section 10.2), finite sequences (section 10.3), and finite trees (section 10.4). Again, from these schematic examples, we derive a large number of special cases.

The intention, with each of these examples, is *not* to present the most clever or efficient algorithm corresponding to a given problem. Rather, the aim is to show that each algorithm development could be performed as a coordinate activity, having strong connections with *other* algorithm developments. We try to *re-use*, as much as we can, material from previous developments. It is not claimed, of course, that this is always possible.

This chapter is an experiment in algorithm construction. In an initial section 10.0, we present a tentative methodology.

10.0. Methodology

10.0.1. Re-use of Previous Algorithms

Throughout this chapter, we follow a systematic methodology whose rôle is to enable us to take account of previous algorithm developments. This is explained in what follows.

All our algorithms will be developed in the form of “operations” of an

Tertiary literature

Book chapter





ideas

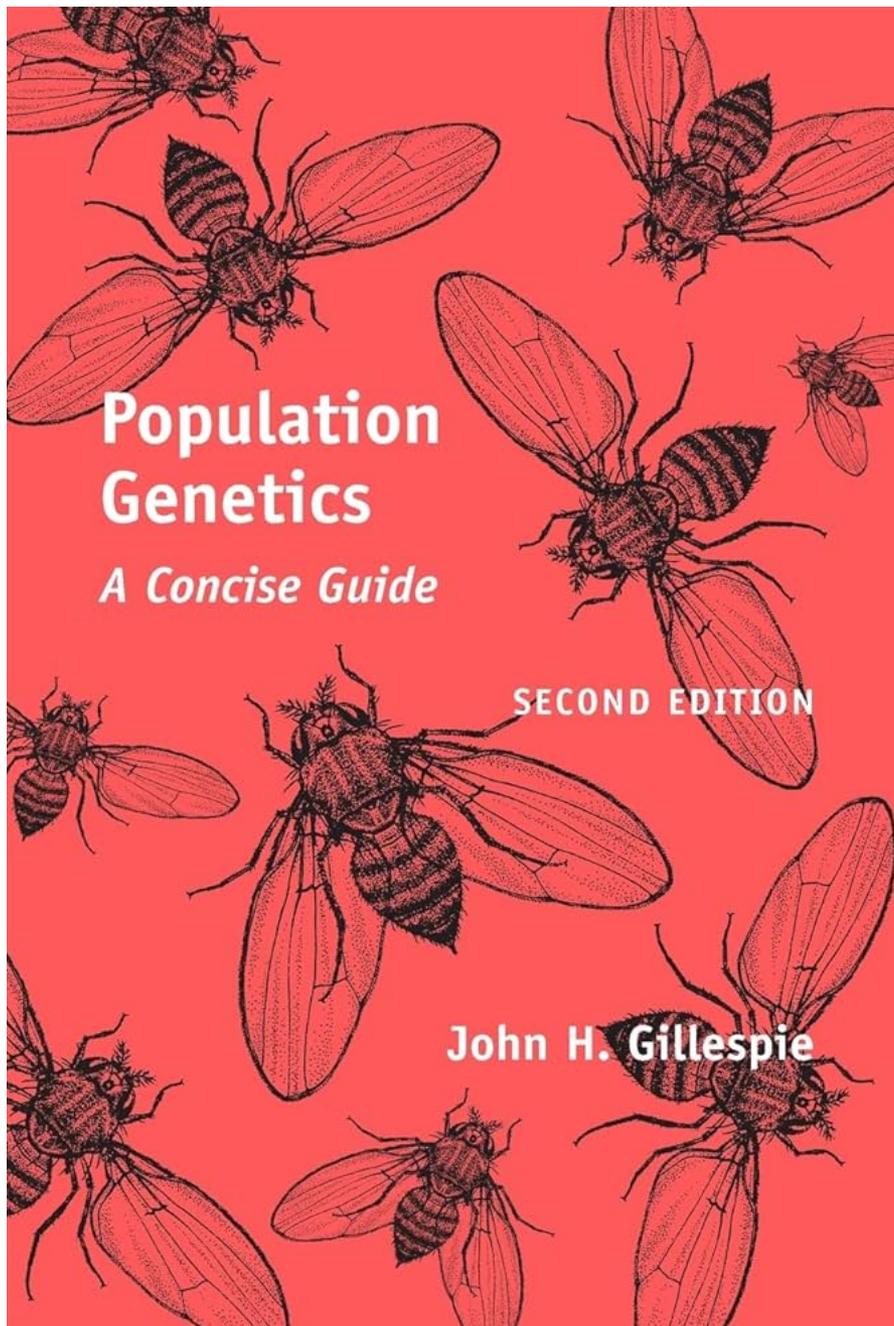
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