Best Current Practices for Mathematics Journals

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Journals remain one of the most important tools of mathematical research and communication. A good journal adds value to the manuscripts submitted to it by providing quality control, improving content and presentation, dissemination, and archiving.

On the other hand, a poorly run journal has a detrimental effect on the mathematical literature. The proliferation of poorly run mathematical journals is becoming an increasing burden to the community. Some of these have been created for dubious reasons, such as the hoped-for prestige of the editors or institutions involved, or with no clear purpose beyond financial incentives. Even journals created with the best of intentions may fail to provide the services above because of inadequate planning or stewardship.

In this document, we draw together some best practices for journal management based on the respective rights and responsibilities of all the journal's stakeholders—readers, authors, referees, editors, publishers, etc.—followed by recommendations for the future. Three fundamental principles apply to all stakeholders:

Transparency ensures that all stakeholders are fully aware of the decision processes that affect them.

Integrity of the publication process is paramount. It includes maintaining an objective review process focused on scientific quality, proper acknowledgment of sources, and a respect for confidentiality where required.

Professionalism is also important. This includes timely handling of manuscripts at each stage of the process, and continuity of management, scope, and vision. Moreover, the quality of the article's metadata should be carefully addressed when it is published to ensure proper dissemination and long-term accessibility of the published version of the article.

This document is necessarily based on currently available technology, and, while some practices are universal, others must be reformulated to adapt to new and unanticipated technological developments. The best practices and recommendations

presented in the document will be periodically revisited and updated as circumstances require.

1 Rights and responsibilities

There are many ways to organize the decision-making processes of a journal. Regardless of how the editors and publishers decide to implement the details, there are certain basic rights and responsibilities of the authors, referees, editors, and publishers that should be respected in all circumstances.

1.1 Authors

1.1.1 Rights

Authors who submit a manuscript to a journal have the right to a careful, timely and unbiased peer-review overseen by the journal editors, who often seek the advice of referees. The level of detail of the review can vary greatly, but, following the principle of transparency, authors have a right to know in advance the processes by which their manuscript will be handled, and a right to be informed of the grounds for the acceptance or rejection of their manuscript, including normally being given access to any referee reports that have been sought. However, manuscripts that are deemed not to adhere to the journal's standards or scope can be quickly returned to the authors with a brief editorial justification.

1.1.2 Responsibilities

Authors must abide by high standards of research integrity and good scholarship. It is the responsibility of authors to submit a well written, mathematically correct article, if necessary seeking advice if it is not written in their native language, to clearly describe any novel and non-trivial content, and to suitably acknowledge the contributions of others, including referees and funding agencies. Submission of an article to a journal implies that it is not currently under consideration by any other journal, and that any substantial overlap with other published or submitted articles is duly acknowledged. In addition authors should be responsive to correspondence with the journal. Multiple authors should communicate fully, speak with one voice, and accept mutual responsibility in their communications with the journal. All authors are expected to have materially contributed to the article, and to be familiar with its contents and be able to explain it (with the possible exception of sections explicitly attributed to only some of the authors). The ordering of authors' names is at the

discretion of the journal and/or authors, although the standard practice in most mathematical articles is to list authors alphabetically.

When publishing a paper that depends on data or computations, authors should ensure reproducibility of their work. That typically requires archiving supplementary materials with the paper or in an appropriate open repository.

1.2 Referees

1.2.1 Rights

Referees have the right to know whether or not the articles they have refereed have been accepted for publication. In addition, it is recommended that correspondence with the authors and all referee reports be sent to the referees.

1.2.2 Responsibilities

Researchers who benefit from the literature and contribute to it as authors also have an obligation to participate in the peer-review process, in particular by serving as referees in their areas of expertise. When doing so, they have a right to anonymity, unless this is clearly waived by the referee, or by the stated policies of the journal. While no one has an obligation to referee any particular article, the decision to do so or not should be communicated in a timely fashion. Potential referees should disclose any circumstances which might compromise their ability to provide an unbiased review. Once a referee has agreed to serve, that referee should adhere to the agreed-upon schedule (typically including revisions) and inform the editor of unanticipated delays. Referees must act with integrity. That means they should familiarize themselves with the expectations of the journal and the review process, and do their best to implement them in an unbiased fashion. They should respect confidentiality, neither disclosing the fact that the article has been submitted nor that they are refereeing it, nor disclosing any non-public content to others, nor using for their own purposes results that are not publicly available. Referees wishing to seek the opinions of colleagues on the submitted article should seek permission from the journal editors. Referees are expected to base their written assessment on publicly available works.

We have noticed a trend, perhaps reinforced by manuscript tracking software, for referees to communicate additional opinions to editors which are not meant for transmission to authors. This concerns us, since the principle of transparency implies that authors should be fully informed of the grounds for the decision on their work. Such confidential comments do not relieve the referee of the obligation to make an honest assessment of the qualities of the article in the report that will be transmitted to the author. We believe that in best practice such comments should be used exceptionally, rather than as a general procedure.

The obligations of a referee are primarily as expert advisor to the editors of the journal; secondly, through the editors, to the mathematical public, where the obligation is the maintenance of standards in the mathematical literature; and thirdly to the authors. Although the opinion of referees on the correctness of an article is normally sought, ultimate responsibility for correctness lies with the authors. Refereeing is an opportunity to provide positive guidance to the author, in particular to point out any errors or inaccuracies found, and to explain how these can be corrected or improved.

1.3   Editors and editorial boards

1.3.1   Rights

Members of the editorial board should be informed by the publisher about:

- the documents sent to the author(s) with the proofs,

- the financial information concerning the journal (*e.g.*, financial support provided to any member of the editorial board),

- the marketing practices concerning the journal (*e.g.*, bundling, contracts with libraries, price for downloading an article),

- bibliographic or full text databases the articles are indexed in,

- how articles and peer-review reports are archived and accessible,

- the secretarial support the publisher provides to editors,

- the data that the publishing platform and that the peer-reviewing platform harvest and how they are used, for which purposes,

- instructions for the publishing infrastructure such as the document management system and the peer-reviewing platform,

- metadata management, including information about its schema, dissemination, or indexing.

1.3.2   Responsibilities

The editors and editorial boards bear the primary scientific responsibility for managing a journal. Transparency requires that the journal should have a clearly formulated statement of its vision and scope, and a detailed description of its submission, peer-review, and publication processes, including the responsibilities of editors and referees.

These should be publicly disseminated, and, in particular, all editors should both be aware of and in agreement with them. In many cases, the editorial board will take the primary role in formulating, monitoring, and updating these statements.

A primary responsibility of the editors is to implement the peer-review process, ensuring its integrity and fairness. This is carried out by

- a wise choice of referees, with sufficient expertise but avoiding any potential conflicts of interests,

- communicating with authors, referees, managing editors, and publishers in a timely manner,

- ensuring that the process moves forward by following up on referees and appointing new ones when necessary,

- arriving at decisions on objective grounds which are communicated to authors and to referees, as discussed above.

Editors should ensure that articles are reviewed on purely scientific grounds, and that authors are not pressured to cite specific journals, articles, or books for non-scientific reasons. In particular, referees should not be suggesting references to their own work, unless there are compelling reasons to do so. There should be clear and transparent procedures for handling submissions which guarantee that the standards of the journal are maintained.

Some journals use a quick reject procedure in which editors may determine that an article is unsuitable for the journal without sending it for outside review. In this case, the editor must ensure that decisions are made fairly and objectively. The decision whether to accept or reject a manuscript is a complex judgment, depending on the submitted manuscript, the existing literature, and the goals and standards of the journal. Different referees and editors may well come to different conclusions. Referees sometimes make mistakes; therefore we recommend that editors request at least three referee reports. It is also important that appeals against rejection of an article are fairly handled.

As noted above, authors have the right to be informed of the grounds for the acceptance or rejection of their manuscript, including normally being given access to all referee reports. There may be exceptional circumstances when an editor can reasonably decide to exclude part of a report, for example if it contains libelous or insulting remarks, obvious errors, or certain kinds of sensitive information. Nonetheless, it is important that such editorial discretion not be used to suppress inconvenient comments, such as a recommendation to accept the article when the editor's decision is to reject it.

Editors should be alert to unethical practices such as simultaneous submissions to different journals, plagiarism, and self-plagiarism, be prepared to impose appropriate sanctions (such as refusing to consider further submissions from an offending author for a certain period), and cooperate with publishers in adopting procedures to eradicate such practices.

Editors should watch for papers that depend on supplementary materials such as code or data, and ensure that these materials are appropriately archived. Furthermore, we recommend developing policies for what is expected from authors to ensure reproducibility.

1.4 Publishers

1.4.1 Rights

Publishers have the right to implement a sustainable business model for the journal to survive, provided that it does not create too many burdens or barriers for mathematicians. For example, even open access journals need to maintain technical infrastructure and may have administrative staff. How best to sustain journals while serving the needs of the mathematical community is not yet clear, and it is reasonable for publishers to experiment with different approaches.

1.4.2 Responsibilities

For most journals, the editorial board does not itself oversee the production and business processes. These are usually carried out by a commercial publisher, professional organization, university, or other institution. The support publishers receive from authors, editors, and referees in the mathematical community carries with it responsibilities. Most important is a commitment to the mathematical literature and its dissemination. Publishers must also adhere to the principles of integrity, transparency, and timeliness. Detailed information concerning the journal, including editorial board members, journal vision and scope, submission and publication procedures, fees, page charges, subscription pricing, etc., must be made publicly available.

Publishers should inform editorial boards of their policies for marketing, pricing, distributing, and archiving their journals.

Publishers should ensure that articles are widely accessible, affordable in all parts of the world, and permanently archived in a form that can be readily located, referenced, and (possibly after paying a reasonable fee) accessed. Sales arrangements should be flexible, allowing, for instance, the purchase of individual journals and articles. Alternative modes of financing the publication process, such as through author fees, submission fees, page charges, or combinations of these create significant ethical

challenges. First, the opportunity to publish in a peer-reviewed venue should be available to all, subject to scientific merit, not the ability to pay via research grants, institutional support or other means. Therefore there should be methods to opt out of payment when needed. Second, payment in direct return for publication creates a potential conflict of interest with the peer-review process. For this reason, any such journal requires clear, well-defined, effective processes to insulate peer-review and editorial decision-making from monetary considerations.

Accepted articles should be typeset, copy edited (if appropriate), and published online and/or in print in a timely manner. Publishers should establish and clearly communicate to potential authors their policies concerning copyright and authors' web posting. Publishers should track and publish the date of submission, final revised submission, if applicable, and date of publication (electronic and/or print) of published articles. Publishers should respond to and investigate allegations of plagiarism, or other unethical behavior connected with their journals, publish a clear and specific retraction in confirmed cases, and protect the rights of authors by seeking appropriate redress for plagiarism and unauthorized use of their work.

In addition to the article itself, publishers are also responsible for archiving any data, code, or other supplementary material associated with the article and making them available to readers.

When an article is published in open access, the copyright should be retained by the authors, who will instead provide a non-exclusive licence authorising the publisher to publish the article (a Creative Commons Attribution license is strongly recommended).

If an erratum is necessary after publishing an article, publishers should distinguish between an author's erratum and a publisher's erratum, to ensure that the responsibility of the error is properly attributed.

1.5 Funding Agencies

1.5.1 Rights

Research funding organizations shape the research process by providing a framework of good scientific practice including guidelines for publications of tax-funded research. Almost every funding agency commits to an Open Access policy according to the latest best practices. These policies address the publication costs or the development of publication infrastructure. Funding agencies play a key role in establishing open and fair publication models and, at the same time, ensure career-critical scholarly communication for early stage researchers, who may tend to focus on publishing in the highest-ranking journals regardless of their underlying business models.

1.5.2 Responsibilities

Although the philosophy of Open Access publishing emphasizes fair access for readers and acknowledgement to authors, there are many business models using the name Open Access. Research funding agencies are responsible for keeping up with business models and adapting their policies regularly in order to foster ethically sound publishing business models, whilst discouraging dubious ones.

1.6 Libraries

1.6.1 Rights

Libraries are subject to profound changes and remain the keepers of traditionally published scientific knowledge at the same time. Despite most transformations, libraries uphold rigorous metadata quality and enhance metadata frameworks in considering new media and publication formats. The conservative handling of bibliographic metadata allows for both accurate information research or "fuzzy" discovery. Furthermore, metadata exchange and reuse in different indexes benefits from standardisations.

Increasingly, libraries adopt the role of publicly funded publishing institutions, not only hosting and administering journals themselves transparently and on a not-for-profit basis, but also serving as intermediaries between research institutions and publishers. Although this is mostly invisible, libraries negotiate expensive contracts for widespread access, or support the transformation of a subscription-based journal towards an appropriate Open Access publication model.

1.6.2 Responsibilities

Libraries remain allies to researchers by preserving and digitising mathematical knowledge, and promoting global free access to it. Also, libraries must uphold high quality in metadata as well as in indexing frameworks to guarantee the FAIR principles: findability, accessibility, interoperability, and reusability. Finally, high-quality and unbiased metadata allow for reproducible bibliometric analysis, where mathematics, in particular, shows subject-specific idiosyncrasies.

2 Recommendations

In this section, we append some more general recommendations for successful journal stewardship which are based on observed best practices among existing journals. These are presented to help editors and publishers launch successful new journals, as well as to strengthen and improve existing journals.

The vision and processes of a journal are very important to its success, and we encourage journals to involve their editorial boards in addressing these issues. Communicating this vision to all involved with production of the journal will, in the long run, save a great deal of time and effort, avoid problems and misunderstanding, and contribute greatly to the success of the journal.

The maintenance of a professional system for handling manuscripts throughout submission, refereeing, revision, acceptance or rejection, and publication requires careful thought and effort in collaboration between publishers and editors. A clear procedure for handling mistakes, errata, retractions, counterexamples, and updates should be established. We have observed a worrying increase in instances of plagiarism, and we encourage journals to consider instituting procedures for detecting, publicizing, and appropriately dealing with plagiarism in submitted articles. Such procedures rely on editorial judgment, but may well be supported by automated systems, commercial or otherwise, and we encourage the development of such systems appropriate for use by authors, editors, referees and publishers. Members of the editorial board must be involved in the selection and design of any automated systems involved in the peer-reviewing, publishing and archiving processes.

The publisher and editorial board should determine the expected standards of exposition, including the languages of publication. In the case where the author is unable to meet these standards, they should decide how much, if any, editorial support or copy editing the journal will supply (this should be clearly explained to authors on the journal's website). There is clear value to well-written and typeset articles, and editorial efforts by a journal are a significant contribution to the quality of the mathematical literature.

We believe that all the editors should be actively involved in the editorial processes of the journal, or, when this is not the case, that a designation such as "honorary editor" should be used. In any case, editors should be informed of and agree to their responsibilities, the scope of the journal, and the processes used to evaluate submissions. Even the agreement to serve as an honorary editor is a public statement of support for the goals and running of the journal, and should be entered into thoughtfully. It is advisable to establish a clear term length for editors, and procedures for renewal. Information about the history of a journal, such as the make-up of the editorial boards over time, is an important part of the historical record, and publishers should endeavor to archive such information in a readily accessible form. The name, institution, email and role in the editorial board of all editors should be mentioned on the journal website. In particular, it is essential to make a clear distinction between an academic editor, who is a researcher paid by an academic institution, and an editor-in-residence, who is employed by a publisher, possibly part-time.

An editor should be informed about the pricing and distribution policies of the publisher and take an active interest in them. Some of the very best mathematical

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journals operate without assessing page charges and with liberal policies on posting of articles in web repositories and on authors' home pages, while maintaining reasonable subscription fees and flexible bundling arrangements. This is a standard to be striven towards. All such policies must be clearly spelled out by the publisher.

While some predict the imminent demise of journals as we know them, we hesitate to join that view. We recognize that there are many forces affecting how journals will be run in the future, and that innovations in publishing will lead to researchers interacting with content in new ways. We hope with this document to support such evolution. If journals are run well, they will continue to play an important role in furthering mathematical research and communication for many years to come.