

Publishing and Refereeing Papers in Physics Education Research

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Abstract. At the 2007 Physics Education Research Conference, a workshop on publishing and refereeing was held with a panel of editors from 4 different publishing venues: the physics educational research section of the American Journal of Physics, the Journal of the Learning Sciences, Physical Review Special Topics–Physics Education Research, and the Physics Education Research Conference Proceedings. These editors answered questions from participants regarding publishing in their respective venues, as well as writing referee reports that would be useful to both journal editors and authors. This paper summarizes the discussion.

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INTRODUCTION

The purpose of the workshop on publishing and refereeing at the 2007 Physics Education Research Conference (PERC) was to help participants learn more about four different publishing venues for physics education research, including what types of papers are appropriate for each, what happens in the editorial office once a paper is received, the role of referees in the decision to publish or reject, and how to write a referee report that will be most useful to the editors and authors of a paper.

Table 1 gives a quick comparison of some of the parameters for each publication. For purposes of this paper, the PERC Proceedings will be referred to as a "journal." Similarities and differences between each will be elaborated below.

CHOOSING A JOURNAL

The biggest factor in deciding to which journal an author will submit a paper should be the audience for which the publication is aimed. The descriptions given here should be taken only as general guidelines. There is overlap between the readers of each

publication and one should not base a decision on which journal to submit to solely on the description given here.

Papers submitted to the American Journal of Physics (AJP)–Physics Education Research Section (PERS), should be addressed primarily to an audience consisting of consumers of physics education research (PER), *i.e.*, those who are interested in reading about it and using it, rather than those who are conducting the research. Thus, the papers should have some relevance, whether direct or indirect, to classroom practice. One should also keep in mind that certain types of PER articles can be published in the non-PER section of AJP. However, those articles should be aimed at an even wider audience, as AJP is received by many physicists, only a fraction of whom are interested in teaching and an even smaller fraction of whom are interested in research on learning and teaching. If you wish the referees of your paper to be PER-savvy, then you should indicate specifically when submitting that you wish your paper to be considered for the PER section of the journal.

The Journal of the Learning Sciences (JLS) is primarily interested in articles that address learning in real-life (non-laboratory) situations. Articles describing a research study should discuss what

TABLE 1. A comparison of some PER publishing venues.

	American Journal of Physics–Physics Education Research Section	Journal of the Learning Sciences	Physical Review Special Topics–Physics Education Research	Physics Education Research Conference Proceedings
Primary audience	Consumers of PER	Researchers interested in learning in non-laboratory environments	PER researchers	A combination of PER consumers and researchers
Acceptance rate	21%	15-20%	33%	70-80%
Time frame from submission to acceptance	~9 months	~10 months	~4-5 months	~2 months
Length guidelines (journal pages)	Roughly 7 pages	Up to 50 or 60 pages	No set limit	4 pages

learning happened, what was done to make it happen, and what is the evidence that it happened. JLS is also interested in the impact of environmental factors on learning, especially in the context of today's technological society. As the title of the journal implies, the focus of the research should be on learning, rather than on teaching.

Manuscripts sent to Physical Review Special Topics (PRST) should be aimed primarily at those who conduct research in PER, rather than consumers. Presentations of curriculum development, new teaching techniques, etc. are not appropriate unless there is a strong, explicitly discussed basis in PER. Theoretical papers may be more appropriate for PRST than for AJP. The research described should advance the field in some way. Because PRST is a purely electronic journal, it is particularly suited to papers accompanied by large amounts of data, such as interview transcripts or even video clips, which can be archived on the journal's website. Another advantage of electronic publishing is the rapid turnaround time once a manuscript is accepted, so PRST is also open to short papers describing notable results that are in need of quick publication.

The audience for the PERC Proceedings is designed to be a record of the PERC given to all attendees, who are a mix of PER consumers and researchers. The Proceedings provides a snapshot of the field and as such is open to preliminary results and research in progress, as well, as papers that would simply be thought-provoking to the PER community.

In addition to the audience, other resources an author can consult to help decide on a journal include the mission statements and guidelines for referees often found on a journal's website. The references cited in the paper to be submitted, in addition to the literature and conceptual foundations that the research draws upon can also be a useful guide.

One concern that many authors have is the page charges for publishing in PRST. Beichner, the current editor, points out that both the American Association

of Physics Teachers and the American Physical Society have established a fund to help defray these charges for authors in need and this fund has not yet been depleted. Thus, page charges should not discourage authors from submitting to PRST.

Finally, authors should remember that they must, in the end, choose only one journal. It is unethical to have the same manuscript be considered for publication by more than one journal at a time. If preliminary results have already been published in the PERC proceedings, more research or analysis must be added in order for the same study to be submitted to a journal such as PRST, *i.e.* there must be some "value added" by the additional publication.

THE EDITORIAL PROCESS

Once a manuscript is received by the editor of a journal, the process for each of the four publications described here is similar.

At PRST, Beichner will skim the submitted paper and decide on two referees for the paper based on expertise and previous referee assignments. A graduate student may occasionally be asked to serve as a third referee. The referees are asked to complete their review within three weeks. Depending on their reports, the paper may be accepted, rejected, or returned to the author for revision and resubmission. Thus far, the acceptance rate for PRST has been 33%, though this number is skewed downward by the submission of inappropriate papers (such as those discussing parity violation or special relativity). Of the papers that have been accepted, the median time between submission and acceptance has been 133 days.

At the AJP-PERS, the acceptance rate has been 21%, although this number too, is skewed downward by the submission of inappropriate papers. A paper submitted to AJP-PERS will sometimes be returned to the author because of length concerns. In the past, the typical AJP article has been approximately seven

journal pages. If a submission is significantly longer than this, *e.g.*, more than 10 pages, then its likelihood of being returned without review increases. One quick method suggested by Cummings, the current editor, to estimate the journal page length of an article is to take the number of manuscript pages (11-point font, double spaced) including figures and references, and divide by three. Although there is no length limitation for papers published in PRST, long papers are less likely to be read and also will take more time to be reviewed by referees. The most frequent complaint by PRST referees is excessive length.

At JLS, Kolodner, the current editor will typically send a submission to an "action editor" in the appropriate field, who will skim the paper and choose referees. At this time, the likely recipient of PER-focused papers is David Hammer. Each submission is sent to three referees, two in the paper's specific area and one that is somewhat outside to insure that the paper is accessible to non-specialists. Each referee is given six weeks to complete a review before he or she is sent a reminder. When the referee reports are returned, the action editor will read them carefully in addition to the paper itself, then write a detailed decision letter. This letter is sent to the main editor (Kolodner) and then to the author. The most common outcome of the first round of review is a recommendation of "revise and resubmit." Each round of review is about four months long and a paper that is published typically goes through three rounds. The last round is usually quite short, consisting only of a reading by the editor.

Papers published in JLS have been as long as 60 journal pages, allowing the author to include enough data to provide evidence for the conclusions drawn. However, there is a limit beyond which submissions will be returned without review and the usual caveats about fewer people reading very long articles apply.

Although historically, most PER papers have been published in either in AJP or PRST, Kolodner encourages authors to send appropriate manuscripts to JLS not only to help researchers outside of PER become aware of PER work and the PER community, but also to spur PER workers to begin reading journals outside of just AJP and PRST in order to become aware of other research in learning being conducted outside of the context of physics.

Because of the short time required to process papers and to send them to AIP for publication, the editorial process for the PERC proceedings differs significantly from the other three journals. Each submitted paper is sent to three referees, chosen from the pool of authors and other members of the PER community who volunteer to serve as reviewers. In choosing referees, the editors aim for a balance between researchers in a paper's field and those

slightly outside of that field in addition to a balance of more and less experienced PER researchers.

The majority of papers receive recommendations of "publish" or "publish with minor modifications" from all three referees. If one or more referees recommends that a paper not be published, then at least one (and in most cases, all three) of the editors will read the paper carefully to judge (1) whether the objections raised by the referee are sufficient to prevent the paper from being published and (2) whether the objections can be overcome with minor modifications. Papers that would require major changes to be made publishable cannot be accepted because there is no time for a second round of reviews. Authors of accepted papers then have a chance to make modifications suggested by the referees before publication.

Although preliminary research results or even descriptions of experiments that have not yet produced results are welcome in the PERC Proceedings, authors should take care to state the limitations of their conclusions. The four-page limit means that authors must often restrict themselves to describing only a few parts of their work. Also, research in which claims are made based on student quotes can be difficult to publish because of the very limited amount of evidence that can be presented.

THE ROLE OF REFEREES

One important fact to keep in mind is that where AJP, PRST, and JLS, are concerned, referee reports are not votes on whether or not a paper should be published. It is possible for a paper to receive two favorable referee reports, yet for the paper not to be accepted, or at least not accepted right away. Conversely, it possible for a paper to receive two negative referee reports, yet not be rejected. The editor uses the referee reports, along with her own reading of the paper and knowledge of the journal's mission and audience to make a decision.

For the PERC Proceedings, the referee reports take on a more important role because quick deadlines prevent the editors from reading every paper. Because of the wide range of experience and knowledge of the referees, the editors use the referee reports as votes in deciding whether to accept or reject a paper weighted by the expertise and experience of the referees. The particular comments, criticisms, and suggestions made by the referees also play an important role in the decision. Each year, 15-20% of the papers (approximately 10) have mixed referee reports that require the editors to read the papers themselves and come to a consensus on the decision.

There are two primary audiences for which a referee report should be written: the author(s) of the

paper and the editor. For the editor, the referee's job is to help her make an informed decision about the paper by looking at the science and how it fits into the big picture. Are the research questions interesting? Do they move the work of the journal forward? Are the claims stated clearly and backed by evidence? Is the methodology appropriate to the research questions? Is additional data or analysis needed and if that additional data cannot be gathered, is the paper still publishable if the authors soften the claims?

For the author(s), the function of the referee report is to help them make the best possible presentation of their work and also perhaps to help guide their research. The referee should think about whether the paper is written in such a way as to allow the readers of the journal to understand and appreciate the significance of the work. Both praise and suggestions for improvement should be included. One good way to decide what should be included in the report is for the referee to think about what kind of help or suggestions she would want if she were the author of the paper.

On the other hand, the referee should not spend much, if any, time performing the functions of a copy editor. Grammatical or typographical mistakes can be ignored. Also, the referee should bear in mind that writing styles are personal and should not try to enforce his or her writing style on the paper's author(s). It is not the referee's paper! Along these lines, the referee report should not be a wish list of items that the referee would have included in the paper unless those items are crucial to supporting the message of the work. Referees for the PERC Proceedings, however, should pay attention to the formatting of submitted manuscripts because it is possible that they are the only ones who will check to make sure that the paper follows all the stylistic elements required for AIP publication. The formatting of the references is a place where errors are commonly found.

WRITING A GOOD REFEREE REPORT

One of the most important qualities of a good referee report is that it be completed on time. Nothing is more frustrating for a journal editor than for a referee to sit on a manuscript for weeks or months, and then to say that he or she cannot do it. Not only must the editor then find an alternate referee, the alternate referee must also be given some reasonable amount of time to review the paper, lengthening the total time in which the paper is in process. If a referee is really swamped with work, it is much better to let the editor know right away that the review cannot be completed.

There are many guides to writing good referee reports that can be found on the web (see the following section on additional resources). However two general guidelines are the following. (1) Summarize the paper briefly. This lets the author and editor know that the referee actually read the paper and whether or not there are any major misunderstandings in the reading. (2) To paraphrase a quote by Einstein, a report should be as short as possible to get the message across, but no shorter. Use bullet points to make the report easy to read and to respond to.

A referee who does not think that she is sufficiently competent in a particular topic to be a reviewer should keep in mind that editors will often send papers to people who are somewhat outside of the field discussed in the paper to insure that the paper is accessible to a broad audience. In many cases, it is allowable for a referee to show a manuscript to a knowledge colleague for help with writing a report. However, papers under review should never be disseminated widely. If in doubt, a referee should always feel free to contact the journal editor for clarification.

Finally, referees should remember that authors are human beings and so they should write reports that they themselves would be happy to receive. Regardless of how bad a paper is, one can always find something good to say about it. Editors will never reveal the identities of the referees to authors without their permission. However, it is sometimes possible to guess who a referee is. A referee should never write a report that she would be embarrassed by if it became known that she was the author.

ADDITIONAL RESOURCES

Websites for the publications discussed here are:

AJP: <http://scitation.aip.org/ajp/>

JLS: <http://www.cc.gatech.edu/lst/jls/>

PRST: <http://prst-per.aps.org/>

PERC Proceedings: <http://web.phys.ksu.edu/perc2007>

A web article with good general advice on writing referee reports can be found at <http://www.psychologicalscience.org/observer/getArticle.cfm?id=2157>. An article with advice on the actual writing of a report is located at http://people.bu.edu/rking/JME_files/guide_for_referees.htm. Although these articles are not specific to the journals discussed here, much of their advice can be applied directly.

A useful article for authors on dealing with rejection and revising papers is <http://www.roie.org/howj.htm>.

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