

# Chapter 21

## *Journal for Research in Mathematics Education: Practical Guides for Promoting and Disseminating Significant Research in Mathematics Education*



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**Abstract** Research journals play significant roles in the advancement of academic fields of inquiry. This chapter starts with a brief description of the *Journal for Research in Mathematics Education*. Most importantly, this chapter provides practical guides to promoting and disseminating significant research in mathematics education. The guides provided in this chapter will be helpful and insightful for those who are interested in publishing in the *Journal for Research in Mathematics Education*.

**Keywords** Journal for Research in Mathematics Education • Mathematics education • Significant research • Research dissemination

### 21.1 Introduction

As the official research journal of the National Council of Teachers of Mathematics (NCTM), the *Journal for Research in Mathematics Education (JRME)* is unique in the sense that it is sponsored by an organization of mathematics teachers. For nearly 50 years, it has been a premier research journal in the field of mathematics education devoted to the interests of mathematics teachers and education researchers at all levels. When *JRME* was first established in 1970, its stated purpose was to “provide a means for more systematic and comprehensive reporting of research”

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(Johnson 1970, p. 5), and, in particular, to disseminate research dealing with significant problems in mathematics education.

In service to this mission and to NCTM's broad goal of enhancing the mathematics education of all students, *JRME* has been a high-profile venue in which to publish papers that systematically and comprehensively report research that will ultimately have an impact on educational practice in mathematics classrooms. Increasing the impact of mathematics education research on practice has been a longstanding conundrum for the field (Battista et al. 2007; Bazzini 1991; Heck et al. 2012; Heid et al. 2006; Herbel-Eisenmann et al. 2016; Kieran et al. 2012; Malara and Zan 2002; Ruthven 2002; Silver and Lunsford 2017). The editors of *JRME* have maintained a consistent focus over the years on this issue (see, e.g., Cai et al. 2017a; Langrall 2014; Silver 2003).

In this chapter, we discuss *JRME*'s influential role in the field as well as the kinds of manuscripts that it publishes. In providing a brief overview of how the editorial team processes manuscripts, from initial submission to final publication, we hope to illuminate what characteristics make a manuscript likely to be published in *JRME* and to have an impact on the field. Our goal is that this chapter will provide readers with insightful and useful information for preparing manuscripts to be published in *JRME*.

## 21.2 A Journal of Record in Mathematics Education

*JRME* has consistently been rated as one of the top journals in the field of mathematics education, both in the United States and internationally (Dreyfus 2006; Holbrook et al. 2009; Nivens and Otten 2017; Toerner and Arzarello 2012; Williams and Leatham 2017). Indeed, *JRME* serves as a journal of record for the field, archiving reports of the highest quality studies in mathematics education.

Papers published in *JRME* have become some of the most influential in the field. The 20 most cited papers that have appeared in *JRME* had collectively been cited well over 20,000 times by June 28, 2018, with the top 10 having been cited a total of over 13,000 times (see Table 21.1). These and other papers published by *JRME* have led mathematics education research in new directions, provided widely used tools for mathematics education researchers, and informed policy decisions in the United States and abroad.

Since its inception, *JRME* has reflected the evolving patterns and trends of research in the field. In their review of papers published in *JRME* and *Educational Studies in Mathematics (ESM)* over the last 5 decades, Inglis and Foster (2018) investigated patterns in content, theories, and methods characterizing studies published in these journals over the years. Inglis and Foster observed that, after experiencing a peak in the 1970s, the number of studies with experimental designs declined consistently. They also noted the shift from the constructivism-dominated studies of the 1980s to studies increasingly driven by sociocultural theories in both *JRME* and *ESM*. With this shift came an apparent change in the methods used to

**Table 21.1** The 20 most cited papers published in JRME

Title	Author(s)	Citations
Sociomathematical Norms, Argumentation, and Autonomy in Mathematics	Yackel and Cobb (1996)	2,129
Reconstructing Mathematics Pedagogy from a Constructivist Perspective	Simon (1995)	1,590
Unpacking Pedagogical Content Knowledge: Conceptualizing and Measuring Teachers' Topic-Specific Knowledge of Students	Hill, Ball, and Schilling (2008)	1,511
The Nature, Effects, and Relief of Mathematics Anxiety	Hembree (1990)	1,503
Fennema-Sherman Mathematics Attitudes Scales: Instruments Designed to Measure Attitudes Toward the Learning of Mathematics by Females and Males	Fennema and Sherman (1976)	1,488
Duality, Ambiguity, and Flexibility: A "Proceptual" View of Simple Arithmetic	Grey (1994)	1,210
The Acquisition of Addition and Subtraction Concepts in Grades One Through Three	Carpenter and Moser (1984)	1,208
A Longitudinal Study of Learning to Use Children's Thinking in Mathematics Instructions	Fennema, Carpenter, Franke, Levi, Jacobs, and Empson (1996)	1,068
Mathematical Tasks and Student Cognition: Classroom-Based Factors That Support and Inhibit High-Level Mathematical Thinking and Reasoning	Henningsen and Stein (1997)	1,040
An Exploration of the Mathematics Self-Efficacy/Mathematics Performance Correspondence	Hackett and Betz (1989)	951
A Constructivist Alternative to the Representational View of Mind in Mathematics Education	Cobb (1992)	905
Task-Related Verbal Interaction and Mathematics Learning in Small Groups	Webb (1991)	874
Explorations of Students' Mathematical Beliefs and Behavior	Schoenfeld (1989)	860
Prospective Elementary and Secondary Teachers' Understanding of Division	Ball (1990)	828
Metacognition, Cognition Monitoring, and Mathematical Performance	Garofolo and Lester (1985)	801
Open and Closed Mathematics: Student Experiences and Understandings	Boaler (1998)	771
Number Sense as Situated Knowing in a Conceptual Domain	Greeno (1991)	748
Making Sense of Graphs: Critical Factors Influencing Comprehension and Instructional Implications	Friel, Curcio, and Bright (2001)	722

(continued)

**Table 21.1** (continued)

Title	Author(s)	Citations
Sex-Related Differences in Mathematics Achievement and Related Factors: A Further Study	Fennema and Sherman (1978)	721
A Meta-Analysis of the Relationship Between Anxiety Toward Mathematics and Achievement in Mathematics	Ma (1999)	720

investigate research goals, with more studies focusing on classroom discourse observations rather than on individual student interviews. In addition, they observed that research focused on teaching and learning environments has seen a particularly strong increase in representation among papers published in *JRME*, especially research on teacher knowledge and beliefs and curriculum and reform as well as novel assessment development.

### 21.3 What *JRME* Publishes

*JRME* is a forum for the highest caliber of disciplined inquiry into the teaching and learning of mathematics. The journal's editors welcome submissions from researchers all around the world and seek to publish high-quality manuscripts that will contribute significant knowledge to the field of mathematics education. Papers published in *JRME* include Research Reports and Brief Reports as well as Research Commentaries and Book Reviews. Because of space limitations, this chapter focuses on Research Reports and Brief Reports.

The vast majority of the papers published in *JRME* are Research Reports. Research Reports aim to move the field of mathematics education forward and include, but are not limited to, the following: various genres and designs of empirical research; philosophical, methodological, and historical studies in mathematics education; and literature reviews, syntheses, and theoretical analyses of research in mathematics education.

Brief Reports of research are appropriate when a fuller report is available elsewhere or when a more comprehensive follow-up study is planned. Topics for Brief Reports vary. For example, a Brief Report of a novel first study on some topic might stress the rationale, hypotheses, and plans for further work. Alternatively, a Brief Report might provide an executive summary of a large study. A Brief Report of a replication or extension of a previously reported study might contrast the results of the two studies, referring to the earlier study for methodological details. Finally, a Brief Report of a monograph or other lengthy nonjournal publication might summarize the key findings and implications or might highlight an unusual observation or methodological approach.

Whether intended to be a Research Report or a Brief Report, for an author's work to be published in *JRME*, it must exhibit qualities that characterize well-conceived and well-reported research studies. The following section addresses guidelines for preparing high-quality manuscripts.

## 21.4 Guidelines for Preparing High-Quality Manuscripts

High-quality manuscripts submitted to *JRME* share a number of key characteristics. The document *Characteristics of High Quality Manuscripts*, available on the *JRME* web page as well as in the Appendix, provides detailed information about these characteristics, which include aspects of the study's purpose, rationale, and contribution; the literature review, theoretical framework, and research questions; the terminology, writing, and mathematical accuracy; and, for manuscripts that report empirical research findings, the research methods, study design, and results and implications. Past *JRME* editors have also provided guidance on what makes a strong manuscript (see, e.g., Blume et al. 2010; Heid 2010; Heid and Blume 2011). Of central importance is that the manuscript should make a significant contribution to the scholarly dialogue in mathematics education research.

An essential component of any strong manuscript includes a clearly communicated purpose for the study and research questions. Authors should seek to establish why the general area of study is important and how their particular study contributes important new information to the field of mathematics education (Blume et al. 2010; Cai et al. 2019). A recent analysis of peer reviews of manuscripts receiving *JRME* decisions in 2017 showed that *JRME* reviewers look for authors to make a strong, explicit case for the significance of their research questions (Cai et al. 2019). In fact, 55% of the reviews for manuscripts that were rejected by *JRME* in 2017 raised concerns about the research questions (e.g., lack of a clear motivation or connection to a theoretical framework).

Thus, authors preparing manuscripts for submission to *JRME* should make the case that addressing their research questions about some aspect of the teaching and learning of mathematics will offer new insights to mathematics education that extend beyond what has been reported in prior studies. The study may also move the field beyond current methods, instruments, or theories (Heid 2010). Authors are encouraged to focus on understanding a phenomenon deeply rather than investigating any particular classroom, student, lesson, or content. This guidance, however, should not be interpreted as discouraging the submission of reports of replication studies. As we discuss below, *JRME* welcomes such reports. As is the case for all submissions to *JRME*, manuscripts reporting findings from replication studies must include a compelling argument for carrying out and publishing the work being reported (see Cai et al. 2018; Schoenfeld 2018; Star 2018).

Another important aspect of any strong manuscript submitted to *JRME* is its literature review and the inclusion of a theoretical framework. Rather than simply listing or summarizing existing studies, authors should aim to synthesize the

findings of existing studies in a way that provides a basis for performing the study reported in the manuscript. Authors should include important work that supports and grounds the research, such as current research in mathematics education, foundational research that is the basis for the study, and potentially research outside of mathematics education as appropriate. In addition, the literature review connects to and supports the manuscript's theoretical framework, which guides the study. Authors should pay special attention to situating their study in the existing research to highlight the significance of their study. The research questions or hypotheses should be explicitly stated and should be guided by the theoretical framework. For manuscripts that report empirical findings, the theoretical framework should be reflected in the study design, data collection and analysis, and interpretation of the findings, and the research questions should be addressed by the collected data.

Manuscripts that report empirical research findings should also include clearly described research methods and a sound research design. Key elements of the research methodology should be defined, such as how and why the study subjects were selected as well as their number and background information, timelines and procedures for data collection, how each variable was measured, how the research instruments were developed, details of the procedures used to analyze the collected data, and so on. Including examples of instruments, instructional approaches, and observation or interview protocols is encouraged. Moreover, authors should strive to convince readers that the research design and methods are appropriate for answering the study's research questions by providing the validity and reliability data for the instruments, using appropriate statistical procedures, addressing potential threats to validity or reliability of the data, addressing discrepancies in the data, and so on. Finally, all claims about the findings and their implications should be supported by the data.

Whether reporting empirical or theoretical work, manuscripts should include appropriate and clearly defined terminology, coherent writing, and accurate mathematical terminology and content. International authors for whom English is a second language are encouraged to seek editing by a native English speaker. Ideas should be carefully developed, with transitions provided to help the reader understand what will be addressed from one section to the next. It is very important to have a clear chain of argumentation in the manuscript, from well-specified research questions, to a comprehensive literature review that situates the study and demonstrates how it will answer the research questions, to a theoretical framework that guides the study design, to the selection of research methods and data analysis, and to presenting the results and discussing the findings in a way that highlights the contribution of the study.

It should be indicated that because of the varying nature of studies, some of the above characteristics of high-quality manuscripts might warrant more emphasis than others. For example, the Institute of Education Sciences and the National Science Foundation (2013) promote six categories of research that serve as guidelines for individuals preparing grant proposals: foundational, early stage or exploratory, design and development, efficacy, effectiveness, and scale up. The categories can be grouped primarily by what they aim to contribute, with

foundational and early-stage or exploratory research aiming to contribute to fundamental knowledge on teaching and learning; design and development research aiming to develop interventions that target specific learning goals; and efficacy, effectiveness, and scale-up research aiming to generate evidence of the impact of interventions. Because, for example, the parameters, characteristics, and scope of an exploratory study differ from those of a scale-up study, different characteristics of high-quality manuscripts might be more relevant to one than the other.

The current *JRME* editorial team began a series of editorials in March of 2019 that examine some guiding principles for conducting and disseminating research that has an impact on practice. This series of editorials discusses issues related to identifying and selecting significant research questions, framing a study, choices of methodology within and outside of mathematics education, and crafting a research report. Readers are encouraged to seek out these free access editorials for useful perspectives on conducting research.

## 21.5 Preparing a Manuscript for *JRME*

Manuscripts prepared for submission to *JRME* should generally follow the style guidelines laid out in the latest edition of the *Publication Manual of the American Psychological Association*, currently in its sixth edition (American Psychological Association 2010). The maximum length for Research Reports is 12,000 words and the maximum length for Brief Reports is 4,000 words. Word counts for both types of manuscripts exclude references, tables, figures, and appendices. Copies of source materials that are needed to evaluate a Brief Report should be included. Crespo and Cai (in press) have described academic writing as communicating with reviewers. They have provided some strategies for anticipating skeptical reviews when researchers prepare their manuscripts for publication.

## 21.6 Dissertations

Manuscripts based on doctoral dissertations form a notable category of submissions to *JRME*. They often represent emerging and promising work but also suffer from the difficulties of translating from the goals of a dissertation and its usual format and organization to the tighter, more focused approach of a research paper in an academic journal. Authors who intend to submit a manuscript based on their dissertation would be well advised to consult “From Dissertation to Publication in *JRME*” by Thanheiser et al. (2012). This paper provides useful guidance on transitioning from a dissertation to a research journal submission, gleaned from the authors’ reflections on their own experiences publishing work from their dissertations in *JRME*. They begin by suggesting that authors of dissertations read and review for *JRME* to become familiar with the types of papers that it publishes and the language

used in them. A primary challenge of reporting dissertation work within the format of a standard research paper is narrowing the focus to a limited number of key findings. Thanheiser et al. (2012) recommend that authors submitting dissertation work spend ample time determining which ideas they want to focus on and how they will communicate those ideas to readers who may not be thoroughly familiar with the particular topic under study.

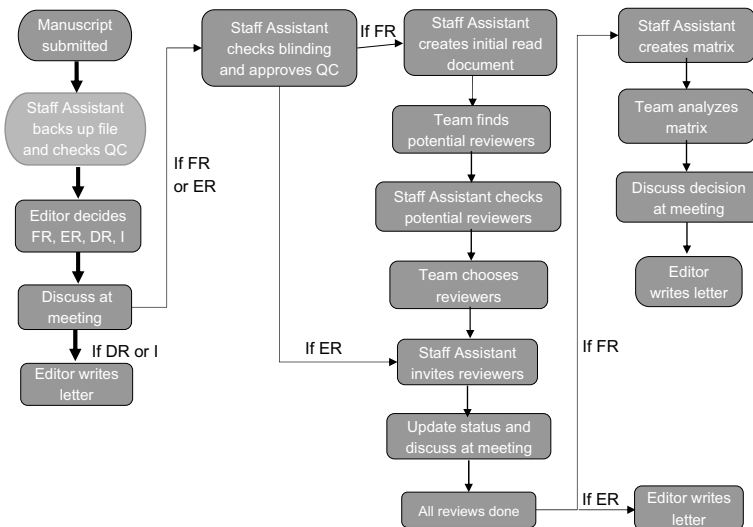
In addition to its primary goal of disseminating high-quality research, *JRME* is dedicated to building capacity in the field by treating the review process as an educative experience. Thus, the editor may provide additional feedback on promising manuscripts that appear to be derived from an author’s dissertation work but which are not yet in a form that is suitable for consideration for publication as a scholarly research paper. Therefore, authors are encouraged to indicate in their cover letter whether their submission is based on a dissertation.

## 21.7 Peer Review and Publishing in *JRME*

### 21.7.1 Peer Review Process

Although the *JRME* editor is responsible for all aspects of the journal, all decisions are collaborative processes among the editorial team members (Fig. 21.1). When a manuscript is submitted to the *JRME* Online Submission System, the staff checks

**Manuscript Processing Flowchart**



**Fig. 21.1** *JRME* manuscript processing flowchart



that it meets technical requirements (e.g., blinding, formatting) and that the manuscript topic falls within the journal's domain of interest in mathematics education research. The editor reads the manuscript, discusses it with the editorial team, and categorizes it in one of four categories:

**Inappropriate (I):** Manuscripts pertaining to topics that do not fit the purposes of *JRME* (e.g., the presentation of a mathematical proof) are considered inappropriate for the journal and are returned to the author without further consideration.

**Desk Reject (DR):** Manuscripts for which the quality of the research does not meet the standards of *JRME* or manuscripts that do not meet the journal's technical or stylistic requirements (e.g., a verbatim chapter of a thesis) are desk rejected and returned to the author without undergoing external review. Typically, these reports have serious flaws or the work does not move the field of research in mathematics education forward in significant ways.

**Editorial Review (ER):** Manuscripts designated for editorial review show promise but are unlikely to be accepted for publication in their current form. As part of the educative mission of *JRME*, manuscripts from dissertation work often receive an editorial review rather than a desk reject. For an editorial review, a single member of the *JRME* Editorial Panel is chosen to evaluate the manuscript and provide feedback.

**Full Review (FR):** Manuscripts designated for full review are typically sent to three to five reviewers. Typically, one reviewer is a member of the *JRME* Editorial Panel and the other reviewers are selected for their expertise relative to various aspects of the manuscript.

*JRME* reviews serve both an educative and an evaluative purpose (Silver 2003; Williams 2008). For manuscripts given an editorial or full review, the reviews are meant to help authors think carefully and deeply about their work, and they "inform the editor's decision not as 'votes' but as sources of insight and perspective" (Heid and Zbiek 2009, p. 474). Thus, the editor synthesizes the points raised in the reviews along with input from the editorial team and makes a collaborative decision that is informed, but not determined, by the various viewpoints:

- **Accept** the manuscript for publication in *JRME*, often pending revisions;
- **Revise and Resubmit**, which is a rejection with encouragement to the author(s) to revise the manuscript substantially and resubmit it for a new round of evaluation by reviewers; or
- **Reject** the manuscript.

Finally, the editor drafts a decision letter to communicate the decision to the author, including suggestions for a revision or an indication of the reasons for a rejection.

### ***21.7.2 Strengthening Manuscripts Through the Revision Process***

Authors receiving a Revise and Resubmit (R&R) decision have up to a year from the date of the decision to make substantial revisions to the manuscript and resubmit it for a further round of peer review. However, authors are encouraged to do so within 4 or 5 months to ensure that returning reviewers are secured. Resubmissions are again sent for a round of evaluation by reviewers, some of whom reviewed the original submission and the rest of whom are new to the manuscript. When the reviewers' evaluations have been received, the editor again provides one of three decisions as before.

Although an R&R decision can be disheartening, it may in fact represent an encouraging outcome (Louie et al. in press). As Martin and Miller noted in 2014, the acceptance rate for revised manuscripts that are resubmitted after receiving an initial R&R decision is significantly higher than the overall acceptance rate for manuscripts submitted to *JRME*. For example, in 2017, the acceptance rate for manuscripts resubmitted after an R&R decision was about four times the overall acceptance rate. This is because manuscripts that receive an R&R generally report significant research that has the potential to make a strong contribution to the field and add to the literature. However, they often require further elaboration or development of particular aspects of the manuscript. A resubmitted manuscript that has been revised, taking into careful consideration the feedback from the reviewers and the editor, is much more likely to fare well in the second round of peer reviews than the original submission.

Common concerns that often result in an R&R decision include (a) issues with the literature review or theoretical framework, (b) issues with the methods, (c) claims that go beyond the data provided, and (d) a lack of coherence among the different parts of the manuscript. In some manuscripts, the literature review or theoretical framework is not appropriate or there is a disconnect between the framework and the design of the study or the data analysis. The theoretical framework may not be described clearly enough to situate the study and highlight the significance of the work. Another concern arises when manuscripts leave important aspects of the research methods unclear or incompletely described. In such cases, the reviewers will often call for more information on coding, data analysis, instruments, subjects, and so on. A third common concern arises when manuscripts include claims that are not clearly supported by the data that have been presented. This can, for example, take the form of overinterpreting the findings or making overly expansive statements about implications. Finally, some manuscripts suffer from an overall lack of coherence. The various components of a research article must hang together logically and fit together into a coherent storyline or narrative. The literature review and theoretical framework should situate the study and justify the research questions. The methods used to investigate the research questions must make sense with respect to the theoretical framework. The presentation and discussion of the results should, again, be clearly connected to the literature reviewed and the study's theoretical framework.

In their letters, *JRME* editors aim to provide detailed summaries of the major issues of the manuscript and to provide specific suggestions for how to address the reviewers' concerns. Authors are encouraged to discuss their revision plan and any issues that are unclear to them with the editor. With this approach, it is the editorial team's hope that authors will regard the editor as a partner in undertaking the revision process rather than as a mere evaluator. As part of the revision process, authors must submit a response letter that details the ways in which they addressed all of the concerns raised by the editor and the reviewers. When, as sometimes happens, reviewers raise conflicting issues, the editor will provide a suggestion to the authors. In their response letter, authors must carefully elaborate on and justify how they chose to handle any conflicting issues raised by the reviewers. In the event that authors disagree with one of the suggestions or concerns raised by the editor or a reviewer, it is strongly recommended that they carefully explain why they did not address the suggestion or concern. Though not a requirement, it is recommended that authors discuss such conflicting issues with the editor before submitting a revised manuscript.

### ***21.7.3 What to Expect After a Manuscript Is Accepted***

A manuscript that has been accepted for publication in *JRME* is typically accepted pending revisions. Even after a manuscript is accepted for publication, there is often room for additional clarification and refinement that would strengthen the reporting of the research. The editorial team typically provides detailed feedback to authors in the decision letter. The editor specifies the remaining issues that must be addressed before the manuscript can be published. Authors are strongly encouraged to communicate with the editor to discuss their plan for revisions. Communication between the author(s) and the editor in this way is extremely worthwhile and helps to ensure the timely publication of accepted articles. It can also help authors to clarify any questions or issues arising during the revision process.

Once the editorial team receives the revised manuscript, they begin copyediting it for APA formatting, references, citations, and quote accuracy as well as reviewing it for internal consistency and clarity. This process often involves multiple rounds of communication with the author(s) until all issues are resolved. When all issues are resolved, the team sends the manuscript to NCTM's copyediting team to be set in page proofs. Two rounds of page proofs ensue.

The first round of page proofs is sent to both the author(s) and the *JRME* editorial team. Authors review the proof of their article and send corrections to the editorial team, who then forward them to NCTM. Substantial changes to content are not appropriate at this time. The final round of page proofs is sent to the editorial team only. This serves as the final round of editing before the issue in which the manuscript is to appear is sent for printing.

## 21.8 Looking to the Future

Research journals play significant roles in the advancement of academic fields of inquiry. At the same time, journal publication is usually a passive process. That is, the journal editorial team receives whatever authors choose to submit and then conducts a rigorous peer review process that informs a publication decision. However, from time to time, *JRME* has attempted to look to the future of mathematics education research by actively calling the community's attention to topics of special significance through the publication of editorials and issues focused on those topics. For example, in a recent series of editorials, Editor Jinfa Cai and his team have highlighted the conundrum of increasing the impact of research on educational practice (Cai et al. 2017b). They described an alternative vision of a world in which tightly woven, sustainable partnerships between teachers and researchers would make steady progress to solve significant problems of practice (Cai et al. 2017a). Moreover, they proposed alternative pathways for research that would enable such partnerships to address teachers' pressing problems through innovative uses of data and technology, artifacts to store and share professional knowledge, and radical changes in institutional structures and incentives for both researchers and practitioners (Cai et al. 2019). The aim of these editorials was to stimulate discussion and to encourage those in the field of mathematics education to look to the horizon of what might be possible.

Another example of *JRME*'s effort to both deepen and push forward the conversation in the field took the form of a 2013 *JRME* special issue on equity that highlighted the increasing importance (and relevance to mathematics education) of sociopolitical issues in an increasingly globalized world (D'Ambrosio et al. 2013). The special issue's 10+ articles "all illustrate that mathematics education is always social and political" (D'Ambrosio et al. 2013, p. 6) and call upon the reader to explore issues of identity and power as they relate to ensuring that all students have the opportunity to experience high-quality mathematics education.

Early in 2018, through a fortunate confluence of manuscript submissions, *JRME* was able to publish a number of replication studies. Once again taking the opportunity to engage the mathematics education research community in an important conversation about moving the field forward, the editorial team raised questions about the long-standing but largely unaddressed calls for more replication research (Cai et al. 2018). Sir Ronald Fisher, the father of modern educational statistics, considered replication to be one of the fundamental building blocks of experimental research design (Fisher 1935). Collins (1985) referred to replication as "the Supreme Court of the scientific system" (p. 19) in which prior findings can be tested for validity or explored to find the conditions under which they do or do not hold true. As far back as 1970, Nathaniel Smith referred to replication studies as "a neglected aspect of psychological research" (p. 970). This has been true both in the larger field of psychology (Makel and Plucker 2006; Makel et al. 2012) and in mathematics education. Indeed, although replication is a key aspect of knowledge building in many fields of research, its place in mathematics education research

journals has never been prominent. The editorial team saw this as an opportune moment to advance the conversation around replication, proposing that conceptual replications might be the key to making replication a more powerful tool in mathematics education (Cai et al. 2018).

When NCTM decided to establish *JRME*, it was with the conviction that research was essential to improving mathematics education. As Julius Hlavaty, the NCTM president at the time, remarked in 1970,

It has become increasingly clearer to the responsible leaders of the Council and to its large and talented subset of people interested in research that the time has passed for occasional and sporadic concern in this area. We must—and will—strive mightily through the JOURNAL FOR RESEARCH IN MATHEMATICS EDUCATION to give the teacher in the classroom, the administrator and curriculum consultant at the planning level, and even the man in the street, the information, guidance, and help that research can provide. (p. 7)

Through its nearly 50-year existence, *JRME* has therefore served the mathematics education research community as a journal of record, a forum for scholarly discussion and debate, and, on occasion, a platform from which to call the field forward to new and exciting developments. The current *JRME* editorial team and ones to come continue the commitment of all those that have preceded them to disseminate significant research that will ultimately promote high-quality mathematics education for all students.

## Appendix

### Characteristics of a High Quality Manuscript

The *Journal for Research in Mathematics Education* seeks high quality manuscripts that contribute knowledge to the field of mathematics education. For an author's work to be publishable, it needs to exhibit qualities that characterize well-conceived and well-reported research studies.

The following information illustrates characteristics of strong manuscripts that have been submitted to *JRME*. This advice for potential authors is intended to be illustrative rather than exhaustive and pertains primarily to reports of empirical studies and theoretical articles; it does not necessarily reflect what would be appropriate for research commentaries or book reviews.

### Inclusion of Appropriate Purpose and Rationale

- Describe a clear purpose for the study.
- Establish why the general area of study is important and how this particular study can contribute important information to the field. (One should not conduct a study simply because no such study has ever been done.)
- If examining a second context for an existing study, explain why the second study is useful. (This is not intended to suggest that replication studies are not appropriate.)

### **Clear Research Questions**

- State research questions or research hypotheses explicitly and clearly in the manuscript. (The reader should not have to guess what the research questions were.)

Clear research questions are guided by the theoretical framework and are addressed by the data collected and analysis performed on that data.

### **An Informative Literature Review**

- Provide a basis for doing the study that is reported.
- Synthesize studies, creating more than a listing or summary of existing studies.
- Include credible sources (e.g., peer-reviewed journal articles) rather than drawing exclusively on project reports and unpublished works. Address results of previous research along with pertinent policy documents.
- Cite from a source accurately and reflect what was published in the original source.
- Include pertinent international research literature rather than limiting the review to that of a single country.
- Cite a variety of pertinent studies, not just your own work or that of your colleagues and collaborators.
- Include important works that support and ground the research such as current research in mathematics education; foundational research that is the basis for the study; and potentially works outside of mathematics education as appropriate.

### **A Coherent Theoretical Framework**

- The study is guided by a theoretical framework that influences the study's design; its instrumentation, data collection, and data analysis; and the interpretation of its findings.
- The literature review connects to and supports the theoretical framework.
- Make it clear to the reader how the theoretical framework influenced decisions about the design and conduct of the study.

### **Clearly Described Research Methods\***

Include key elements of research methodology such as:

- From what population the subjects were drawn, how and why they were selected, and how many were included;
- Information on the instructors and their backgrounds;
- When and how often the subjects were interviewed or tested;
- How many classrooms were included in the study;
- How each variable was measured;
- How research instruments were adapted or developed;
- Examples of items from research instruments;
- Descriptions of instructional approaches;
- Examples from instructional materials;

- Protocols used for classroom observation or interviews; and
- Details of the procedures used to analyze qualitative data.

### **Sound Research Design and Methods\***

Employ research design and methods appropriate for answering the study's research questions:

- Give validity and reliability data for the instruments used;
- Use appropriate statistical procedures and meet their assumptions; and
- Use instruments appropriate to the study's subjects to measure outcome variables.
- Address threats to trustworthiness.
- Describe discrepant events.
- Use member checking when appropriate.

### **Claims about Results and Implications that are Supported by Data\***

- Provide supporting data for each claim that is made.
- Do not draw conclusions or suggest implications that inappropriately extend beyond what is reasonable based on the data.
- Interpret and contextualize the study's results.

### **Contribution to the Field of Mathematics Education**

- The study examines some aspect of the teaching and learning of mathematics and offers new results or new insights to mathematics education that extend beyond what has been reported in prior studies.
- The study moves the field beyond current methods, instruments, and/or theories.
- Focus goals on understanding a phenomenon deeply rather than investigating any particular classroom, student, lesson, or content.

### **Clearly Explained and Appropriately Used Terms**

- Clearly define terms that are likely not to be understood by many readers (e.g., educational terminology unique to a particular country or region).
- If using familiar terms in nonstandard ways, provide explanations for doing so.
- When using terms that have several possible interpretations, clearly identify which interpretation is intended.
- Avoid using terms interchangeably that have different meanings (e.g., proof, reasoning, argumentation, and justification).
- Do not treat multidimensional entities as if they were one-dimensional (e.g., "reform curricula" are not a singular entity and "reform" involves changes in curriculum, pedagogy, and assessment, not just in curriculum)

### **High Quality Writing**

- Provide helpful transitions so the manuscript flows well from one section to another.
- Develop ideas rather than listing collections of thoughts in paragraph form.

- Ask colleagues or employ editors to correct errors in grammar, spelling, and sentence structure.

### Mathematical Accuracy

- Use mathematical terms correctly in conceptualizing their research.
- Use correct mathematics content in instructional materials, interview protocols, and written instruments.

\* These items may not be applicable to manuscripts that primarily address theoretical issues.

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