# Can the usefulness of publishing models for statistics and data science education journals be improved?

**Saturday**, July 19th 9:45 am – 11:00 am CT

*Juana Sanchez (UCLA), Jeffrey Witmer (Oberlin College and Conservatory), Susan Peters (University of Louisville), Jennifer Green (Michigan State University), Helen MacGillivray (Queensland University of Technology)*

*Location: Gerdin 0145*

# What is a journal's publication model?

- A journal's publication model refers to its aims and scope, reviewing process, and publication pipeline.
- Aims and scope include, implicitly or explicitly, envisioned readership, authors, and purpose and hence its usefulness.
- This session focuses on usefulness to readers, recognizing that readers are also authors or potential authors

# Outline of Breakout Session B3B

1. Jeff Witmer, Moderator, Past Editor (2019-2021) of JSDSE - Introduction.

2. Activity before presentations– Discuss handout part 2, Q1 and Q3. (10 min)

3. Brief presentations by the current Editors of SERJ, TS, ST and JSDSE.

4. Q&A, activity after presentations-Handout part 4, Q3 and Q4.

# 1. Jeff Witmer, past editor of JSDSE. Introduction to the Session and the Activities

When I look at a paper, I always ask myself “How can I use this in my teaching?”

I also ask “How easy will it be for me to use this?”

What questions do you ask yourself?

# 2. Activity (handout part 2)(10 min)

Ask yourself the following questions (Q1 and Q2). **You may write your answers on the handout -pens are available**. Then pair with the person or persons sitting next to you and share your answers with them.

**Q1.** How often do I read statistics and data science education journals to find resources, inspiration, professional development, and research that can inform instruction? (Note: if you read journals other than SERJ, JSDSE, TS, ST, which are those journals?)

**Q2.** If I do not read statistics and data science education journals, where do I get resources to improve and modernize my teaching, professional development, and research?

# 3. Presentation of the Journals

3.1 Teaching Statistics (TS) by Helen MacGillivray

3.2 Statistics Education Research Journal (SERJ) by Susan Peters

3.3 Statistics Teaching (ST) by Jennifer Green

3.4 Statistics and Data Science Education (JSDSE) by Juana Sanchez

We will keep most of the Q&A for after the presentations.

ICOTS 12


TEACHING STATISTICS
An International Journal for Statistics and Data Science Teaching

# *What is internationally useful and representative of good practice in Teaching Statistical and Data Sciences?*

Teaching Statistics Trust established in 1978

(1) Various Institutions interested in the promotion of education in Statistics and the teaching of statistics have resolved that a fund (hereinafter called "the fund") should be established for charitable purposes only to establish a Journal and that the Trustees should be nominated as the original

Extracts from Charter

furthering for the public benefit the study and research in statistical education and ancillary to this to promote a Journal (hereinafter called "the said Journal") devoted to the dissemination of educative information about statistics and on the teaching of statistics and any other information ancillary thereto and

Teaching Statistics - Wiley Online Library

# Aims and scope built over time based on authors' submissions, reviewers' feedback & reader metrics

*Teaching Statistics* is intended for all those who teach or develop teaching in statistics and data science within or across any disciplines, including STEM, health, business, social sciences, and education.

It is for teachers of students at any educational level, especially for those who teach school age students, or tertiary students who are building their statistical and data thinking and skills, no matter what their formal educational background.

The emphasis is on good practice in teaching, consistent with the statistical and data sciences as a distinct discipline, and which reflects knowledge of statistical and data science education. Teaching contexts should be clearly identified.

Contributions can seek to enrich, inform, stimulate, guide, inspire, correct, or entertain, but with accessibility to a wide audience.

Research, whether educational, statistical, or in any discipline, should link with teaching practice, and teaching practice should link with the scholarship of teaching the statistical and data sciences.

Formal or theoretical material should be kept to a minimum or placed in supporting information. *Teaching Statistics* is a refereed journal, with double-blind reviewing.

# Reviewers are also readers: they tend to look for usefulness

Some of the common comments and queries relevant to readers and usefulness

*The readership is international – ensure your context is described and understandable to an international audience.*

*Unless the context is clear and clearly described, a reader cannot know what is relevant*:

- Teaching
- Curriculum
- Students

*What is the learning*?

- Objectives
- Outcomes
- Feedback

*The reader needs to know more of what was done and how to implement it (and assess if relevant).*

*How does this link with good practice?*

*How does this link with sound research?*

# Facets and degrees of usefulness – as reported

**Specific resources, for example:**

- Apps, easy-to-use software development
  - Can be simple-use for students but tend to highly specific, often limited & formulaic
- Visualisation and dynamic software (e.g. R-based, Shiny)
  - User-friendly & bit more useful, but again can tend to old-fashioned standard approaches
- Datasets - provided real, multivariate, complex, AND interesting aspects & student work discussed

**Readers want to know comparisons with existing resources, practical info & student learning**

- Readers like specific resources to be audited and curated – MSOR in UK found this out 20 years ago

**General, statistically-sound pedagogic approaches**

- Grounded & rounded, referenced, curricula and teaching context described, student work/learning given


**Well-researched, soundly argued, deeply-analytical reviews**

**Research**

- if statistically topical & relevant; statistically investigately valid; meaningful for statistical pedagogy

**Special issues** – very much so, especially if combine above

# No matter what type - from reviewers on dependability

**Issues**: identified & well-described without exaggeration, relevant, consistent with current statistical and statistics education issues, statistically correct and not statistically trivial. Avoidance of excessive over-referencing, statements without evidence/reference (reviewers hate these), overly general statements & too broad background (also on reviewers' hate-lists). Knowledge of statistics and statistics education.

**Contexts**: teaching, student, curricula contexts – without context information, nothing is useful.

**Data and information**: data sources/collection fully described; understanding of limitations with respect to populations in educational contexts and educational data.

**Exploring data and information**: whether qualitative or quantitative or both; good visualisation & insightful commentary, understanding of nature and types of data and limitations.

**Analysis**: choosing & using appropriate methods within the context & data limitations, identification & understanding of assumptions, use of diagnostics, avoidance of fashionable or over-exotic (& often inappropriate) methods; understanding & avoidance of the usual statistical traps.

**Communication**: within context, discussion of limitations, avoidance of generalised statements.

Interesting that the above has lots of similarities with the statistical investigation & problem-solving process

# Questions for readers

How could aims, scope and criteria be extended or changed to increase usefulness of statistics and data science journals for readers and potential authors?

How can readers let journals and editors know what they would like more of?

**Thank you and here's to Statistics and Data Science!**


# What Research do Statistics and Data Science Educators Find Useful for Informing Their Research and Teaching?

# STATISTICS EDUCATION RESEARCH JOURNAL


- Open-access, online journal (https://iase-pub.org/ojs/SERJ/)
  - 2 regular issues/year - Fall & Spring
  - 1 special topics issue/year - Summer
- Published by the International Association for Statistical Education (IASE)
- Contributes to IASE mission by advancing research-based knowledge to improve the teaching, learning, and understanding of statistics or probability (broadly viewed) at all educational levels and in both formal (classroom) and informal (out-of-classroom) contexts around the world

# STATISTICS EDUCATION RESEARCH JOURNAL

# STATISTICS EDUCATION RESEARCH JOURNAL

- **Reports of original empirical research** describing diverse types of studies of a quantitative, qualitative, or mixed nature.
- **Conceptual papers** that present reflective or theoretical analyses, integrative and critical literature reviews, epistemological studies, or structured reflections on educational practice related to statistics education as a basis for proposing new epistemological and conceptual ideas and that are based on or emerge from scholarly research and make explicit their contribution to future research, theory-building, or teaching and learning in an area of educational practice related to statistics.
- **Brief reports** whose shorter length is usually due to the focus on topics or findings that do not merit or require a lengthier regular paper
- **Other papers**, e.g., reactions to papers published in *SERJ*, considered upon inquiry to the editor

# STATISTICS EDUCATION RESEARCH JOURNAL

- **Audience** includes readers who are engaged in or interested in research on any aspect of statistics education, learning, or usage. Such readers may be involved directly in research or practice in education (e.g., statistics, mathematics, science, engineering) or other fields (e.g., social sciences, measurement, health sciences, public services, official statistics)
- **Writing** exhibits characteristics of a high-quality report (see, for example, https://www.nctm.org/publications/write-review-referee/journals/Characteristics-of-a-High-Quality-JRME-Manuscript/) appropriate for an international audience (i.e., provide sufficient details regarding terms, acronyms, concepts or issues that are country-specific and whose understanding is essential for readers from other countries)

STATISTICS EDUCATION RESEARCH JOURNAL

- What Research do Statistics and Data Science Educators Find Useful for Informing Their Research and Teaching?
  - What topics or types of research are missing or need additional attention?
  - How do we better encourage and support research from a broader range of areas related to statistics?
  - How could the focus and scope of the journal be adapted to increase the reach of the journal in terms of readership and usefulness while maintaining the status of the journal as a research journal?

STATISTICS EDUCATION RESEARCH JOURNAL


- Questions about the Journal and submitting to the Journal?
  - You can reach me at s.peters@louisville.edu
- Ready to submit?
  - Submit manuscripts at https://iase-pub.org/ojs/SERJ/about/submissions

ASA NCTM
STATISTICS TEACHER
SUPPORTING THE TEACHING AND LEARNING OF STATISTICS

# What do K-12 Teachers find Useful for Supporting Their Teaching and Learning of Statistics and Data Science?

# Statistics Teacher (ST)

- **Free** online journal (2 issues/year - Fall and Spring)
- Published by the American Statistical Association – National Council of Teachers of Mathematics (ASA-NCTM) Joint Committee on Curriculum in Statistics and Probability for Grades K-12

**Goal:** Inform and support **K-12** teachers (and more!)

# Online ST Issues Contain…

- Articles about successful classroom practice
- Announcements of important professional development opportunities
- Peer-reviewed lesson plans (Statistics Education Web, STEW)
- Columns about educational resources, technology and assessment tips, etc.

**Levels:** Grades K-5, 6-8, 9-12+

# ST Articles

- Targeted to teachers and teacher educators
- Display and discuss interesting statistical and statistical education concepts and ideas and showcase exemplary lesson plans
- Have a relaxed expository style

## Examples:

Making Sense of Data Visualizations (Thrasher et al., Fall 2024)

Data Science in Secondary Grades (Dueck et al., Spring 2024)

# Statistics Teacher's Future

- **<u>How</u>** do we better ***reach and serve*** K-12 teachers and teacher educators? **<u>What</u>** and **<u>Who</u>** are missing?
- **<u>How</u>** do we better ***encourage and support*** K-12 teachers and teacher educators to share their classroom ideas and practices (especially grades K-5!) with others through ST?

# Calling All K-12 Teachers, Teacher Educators, and Others!

Please share your ideas in ST and encourage others to share too!

## Submission Information:

https://www.statisticsteacher.org/ about-stati

teacher/submissions/

# ST Editors: ST@amstat.org

## Articles

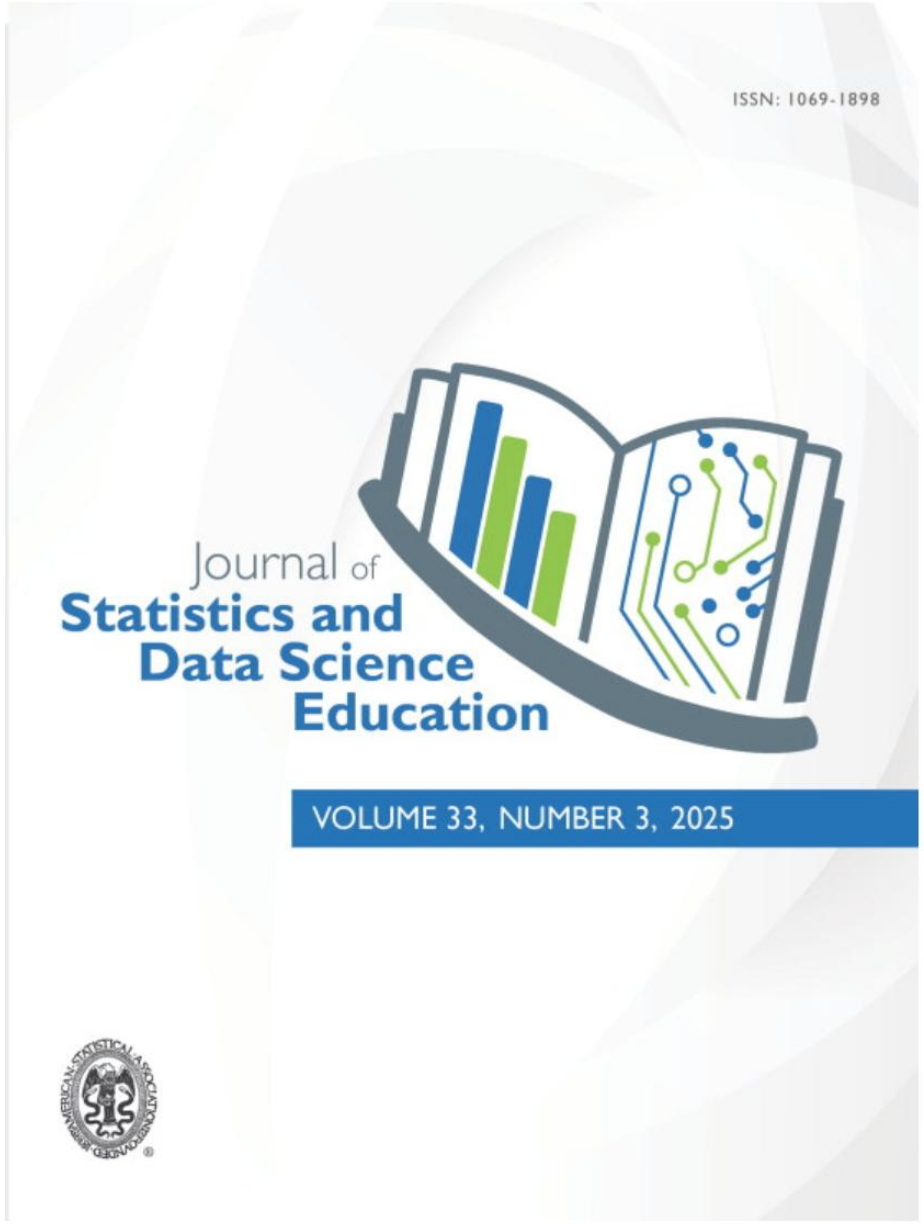
Trena L. Wilkerson
Baylor University

Jennifer L. Green
Michigan State University

## Lesson Plans

Catherine Case
University of Georgia

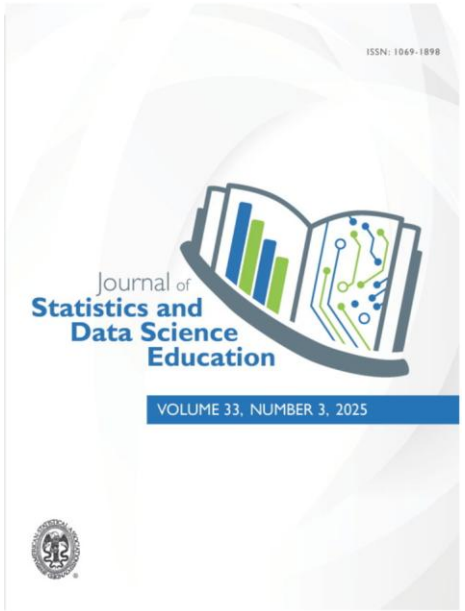
Charlotte Bolch
Midwestern University (AZ)




# Journal of Statistics and Data Science Education (JSDSE)

An ASA's Open Access, Double-Anonymized, Peer-Reviewed International Journal on the Practice of Teaching and Learning Statistics and Data Science – published by T&F

https://www.tandfonline.com/toc/ujse21/current

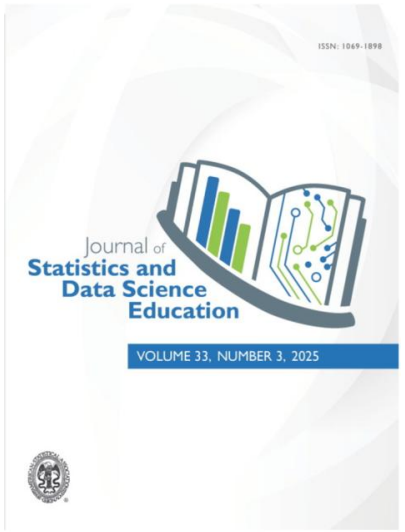



# Aims and Scope

To disseminate *accessible knowledge* for the improvement of the practice of SDSE *at all levels* (elementary, secondary, post-secondary, post-graduate, continuing, and workplace education).

*What Statistics and Data Science Educators Consider Essential for Preparing Learners to Enter the Modern WorkForce*

**Publications are:**
Articles that contribute knowledge in a novel, interesting, actionable, creative, and generalizable way to improve the planning, assessment and execution of SDSE in a specific context.



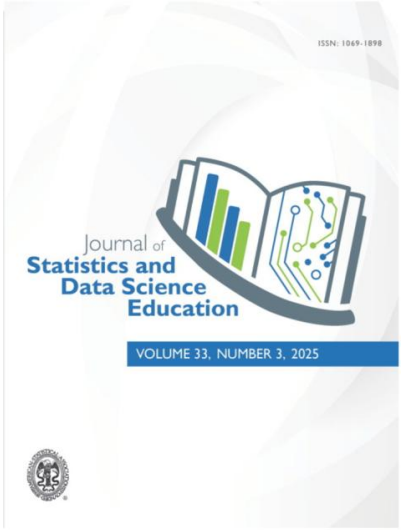

# Topics

1. Setting learning outcomes and learning process objectives, with examples of 2,3
2. Assessment aligned with 1 and 3
3. Aligning the teaching process, content and resources with 1 and 2

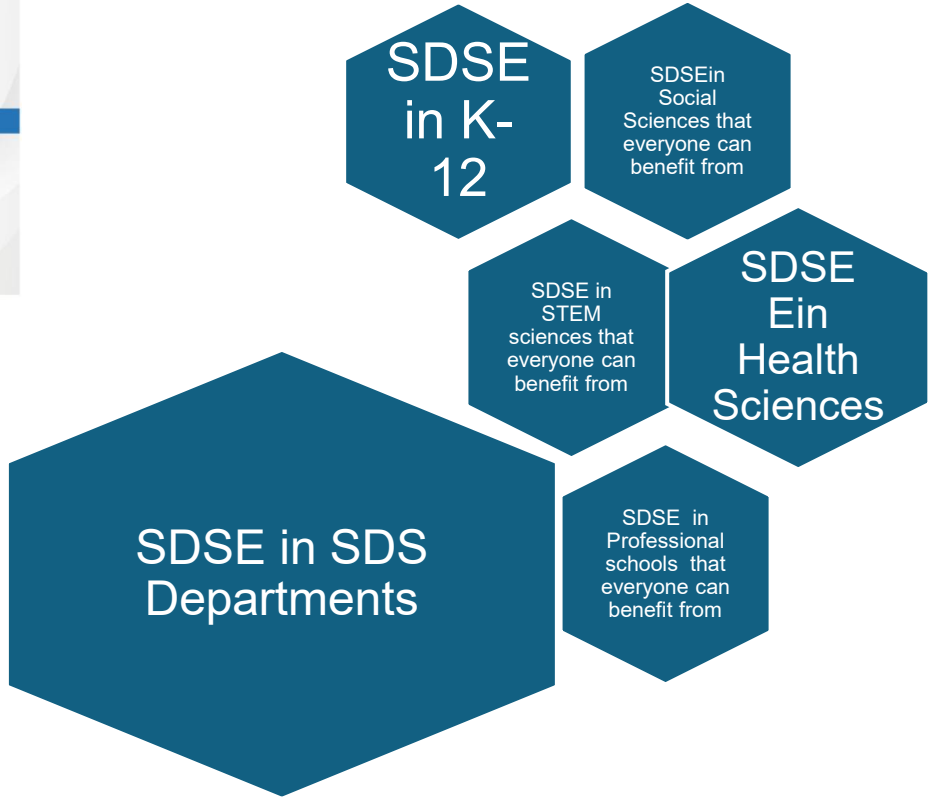
- Curriculum
- Use of novel active learning, student centered pedagogies
- Distance, online learning
- Learning of computational techniques and workflow
- Statistics and data literacy
- Ethics, AI

- Students understanding of SDSE
- Students attitudes and beliefs about SDSE
- Students development of data fluency and acumen, workflow, reproducibility, PPDAC

- Experiences with teaching materials (software, books, AI, other)
- Novel uses of new datasets and their stories
- Innovative methods of instruction of a concept
- Creative and tested ideas (including experiments)



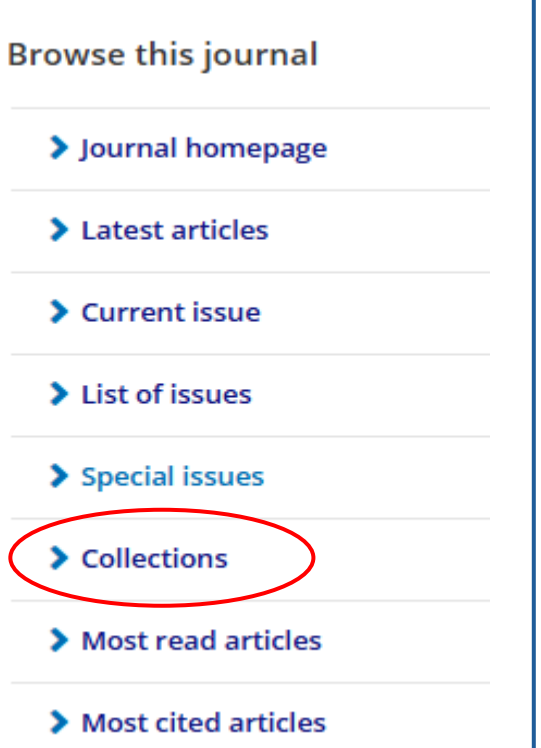

# Scholarship: a JSDSE paper tells the readers where the paper fits in the map of past work, what gap it fills



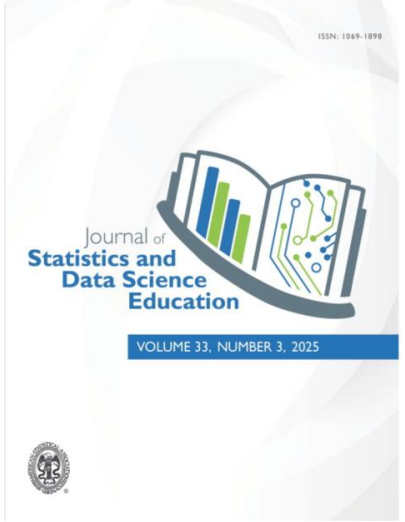

# Readers can find JSDSE papers on topics that interest them by

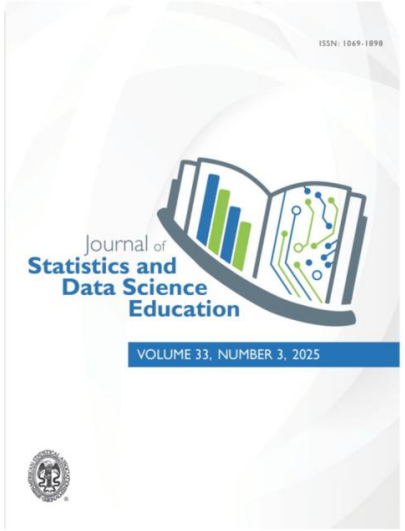
1. **Searching the JSDSE with keywords that reflect their interest, being aware that there are more than one keyword for the same topic**


2. **Browsing the Collections**



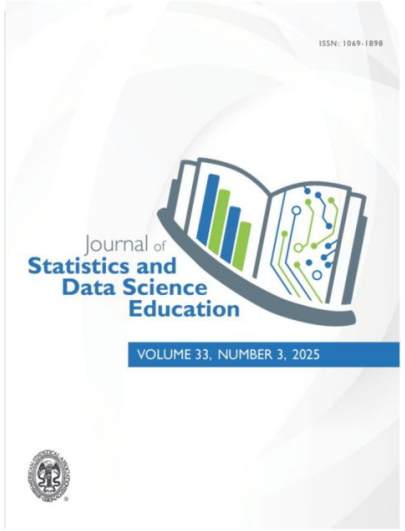

The JSDSE also publishes **scholarly overviews** of the literature on topics in SDSE






## The JSDSE does not publish

- Articles that deal with a theoretical result, its derivation and proof
- Articles on learning analytics that do not deal with the practice of teaching of statistics
- Articles that describe the analysis of data in a particular field if the focus of the article is on the analysis of the data for consumption by researchers in other disciplines
- Articles that do not model good and novel statistical practices
- Articles that are not well planned and well executed
- Articles that do not do good assessment of learning or process objectives
- Articles that do not use scholarship to place themselves in the map of SDSE publications




# Some history
# Editorial Board of the first issue of the JSDSE (then JSE) in 1993

**Editor-in-chief:** **Jackie Dietz**

**Editorial Board members (1993):** J. Tim Arnold, Joan Garfield, J. Laurie Snell, Robin H. Lock, Donald Bentley, George Cobb, Janice Derr, Peter Holmes, Gudmund Iversen, Thomas Johnson, Peter A. Lachenbruch, James M. Landwehr, David S. Moore, Mary Parker, Walter R. Pirie, Allen H. Reed, Thomas Reiland, Eiki Satake, Richard L. Scheaffer, Judith Singer, Henry B. Slotnick, Eric R. Sowey, W. Robert Stephenson, William Swallow, Jim Swift, Michael J.Symons, John Waski, Ann E. Watkins, **Jeffrey Witmer**.

**The Jackie Dietz Award is awarded each year to the best paper selected by an independent committee appointed by the ASA.**

**JSE: 1993-2015 Hosted by the ASA; 2016-today hosted by Taylor and Francis; JSDSE: 2021-today**

# 4. Floor Q&A and discussion (see handout, part 4)

Five minutes to reflect and discuss with your group your impressions about what you heard from us, addressing if possible the following questions (write your own thoughts on the handout).

**Q3.** What do we need from statistics and data science education journals that would make our research and teaching in statistics and data science more effective in schools, universities, and workplaces both within and across disciplines?

**Q4.** We printed in Appendix B the Aims and Scope of each of our journals that we also discussed in the presentations. How could aims, scope and criteria be extended or changed to increase usefulness of statistics and data science journals for readers and potential authors? You may select just one aim and scope, if you want.