Workshop

From Practice to Publication: Writing for the Nordic Journal of STEM Education

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Sammendrag: The Nordic Journal of STEM Education (NJSTEME) is a recently transformed, free, non-commercial and open-access venue for disseminating educational research and development in Science, Technology, Engineering, and Mathematics (STEM) higher education. NJSTEME is designed to be an entry point for publication for those new to either the scholarship of teaching and learning (SoTL) or discipline-based education research (DBER). We also welcome experienced researchers and authors. As part of our transformation, we aim to work with potential authors to help them envision their work as an NJSTEME publication in one of three formats: research article, teaching tool, or perspectives piece. In this workshop, we invite participants to bring their conference abstracts (or similar "starting point" for discussion); alternatively, we will have examples participants can use. We will then introduce the journal and its aims, and, using our new rubrics as our framing, focus on the steps necessary to transform abstracts into journal contributions. Small-group discussion will dominate our time, with introduction and wrap-up in plenum. Several materials will be provided to participants, along with suggestions from journal management, recent authors, and reviewers. We hope this discussion will be productive for those interested in publishing their STEM-education work—in NJSTEME or elsewhere.

Nøkkelord:
Nordic Journal of STEM Education, scientific publishing

1 Why this workshop?

Despite accumulating evidence in favor of student-centered active learning, along with other reformations in teaching and learning (e.g., work-integrated learning, course-based research experiences, etc.), most STEM (science, technology, engineering, and math) higher education instructors continue to teach using outdated, ineffective methods (Stains et al., 2018). Suggested reasons for this are varied, and include a lack of accessible (to practitioners) information about what is effective in specific contexts, and a culture that doesn't view teaching as a scientific endeavor (Wissman and Leontyev 2024, Indorf et al., 2021, Lane et al., 2019). Many venues for publishing STEM-education findings are published in education-science journals, and are not necessarily read by the STEM practitioners whose teaching could most benefit. The fields of Discipline-Based Education Research (DBER; LeRoux et al., 2021, Henderson et al., 2017) and the Scholarship of Teaching and Learning (SoTL; Shulman 2001) both aim to address these discrepancies, by engaging practitioners in research, reflective practice and subsequent dissemination.

Discipline-based education research is an interdisciplinary approach that merges the expertise of STEM educators with psychological and educational research. DBER uses scientific methods to understand how students learn in the STEM disciplines, the challenges they face, and effective teaching strategies. The goal is to develop evidence-based practices that improve teaching and learning in STEM disciplines. The DBER approach ensures that research findings are not only translated into local action but also shared with an international audience of STEM educators and practitioners (Henderson et al., 2017). While DBER is well-established in the United States, this approach is relatively new in Europe (Kortemeyer 2020). SoTL, however, is better established in Europe.

Like DBER, the Scholarship of Teaching and Learning (SoTL) is an evolving multidisciplinary field focused on improving teaching practices and student learning outcomes in higher education (Fanghanel et al., 2016, Shulman 2001). SoTL research also encompasses various topics, including assessment, accountability, student motivation, and learning theories. While there is considerable overlap between these approaches, SoTL historically has emphasized reflective teaching practices (in which the scholarship may center on one's own teaching), and DBER has focused on taking an interdisciplinary, scientific approach to teaching and learning. Compared with DBER, SoTL is broader and less grounded in a specific discipline.

In this workshop, we specifically focus on communicating our DBER or SoTL findings to our communities of educators in STEM higher education. Working from the vantage point of one journal, we will lead an interactive discussion on how participants can envision their conference abstracts as journal contributions.

1.1 What is NJSTEME?

The Nordic Journal of STEM Education (NJSTEME) is a recently transformed, free, non-commercial and open access venue for disseminating educational research and development in Science, Technology, Engineering, and Mathematics (STEM) higher education. NJSTEME invites contributions that address pedagogical, educational, and

academic developments or studies. Nordic perspectives are our main focus; however, articles with a wider scope can be considered if the authors have positioned them to be relevant to issues in Nordic STEM higher education. NJSTEME invites contributions classified as both the Scholarship of Teaching and Learning (SoTL) and Discipline-Based Education Research (DBER).

2 The workshop

As part of the Journal's recent transformation, with a new home, new Editorial Board, new workflows and new review rubrics, we have created a workshop to engage potential authors (for this or any similar journal) in reviewing their own work in light of specific journal criteria:

1. An evidence-based, theoretically grounded rationale for the work described
2. A clear research question or testable hypothesis
3. Sound methodology that can be replicated based on the information provided
4. Data that align with the stated question or hypothesis
5. Conclusions and critical reflections that are justified based on the data presented
6. Findings that advance our understanding of teaching and learning in STEM higher education

Participants will bring their own conference abstracts, or we will provide them with an example, to work with during our discussions. Specifically, we will introduce the journal and review criteria, and lead participants in a paired activity in which they view abstracts in light of our review rubrics. We will emphasize addressing the overarching question: "what would it take to get this abstract ready for submission to a peer-reviewed journal?"
After the workshop the participants will be able to

- *Use a rubric to analyze their own and their peers' works in progress, in relation to broad ideas of scholarly work suitable for the journal, and the aims and scope of the journal*
- *Create a plan for further independent work on their own manuscript that addresses both the process and the anticipated product*

Several materials will be provided to workshop participants, along with suggestions from journal management, recent authors, and reviewers. We hope this discussion will be productive for those interested in publishing their STEM-education work—whether in NJSTEME or elsewhere. An example worksheet is provided below.

The workshop timeline is as follows:

Time	Activity Description	Objective
00:00 - 00:10	**Introduction and Workshop objectives**	Participants understand the workshop purpose and objectives.
00:10- 00:30	**First breakout: reading short examples and giving guided feedback, in pairs**	Familiarize participants with extended abstracts (either their NJSTEME abstracts or examples provided by the workshop leaders) prior to discussing "What would it take to turn this into a NJSTEME submission?"
00:30 - 00:40	**Introduce the NJSTEME rubrics**	Introduce discussion of "What would it take to turn this into a NJSTEME submission?"

00:40 – 1:30	**Second breakout: complete worksheet and discuss in pairs, with break**	Identify concrete steps to be taken to transform conference submissions into NJSTEME submissions
01:30 - 02:00	**Conclusion, share materials online, and open for follow-up questions**	Provide links to online supplementary materials, rubrics for different article types, and other journals in the STEM Education Research sphere. Include short testimonials from recent authors, reviewers, and the editorial team.

Takk til

UHR-MNT, for financial support.

Referanser

Fanghanel, J., Pritchard, J., Potter, J., & Wisker, G. (2016). Defining and supporting the Scholarship of Teaching and Learning (SoTL): A sector-wide study. *Literature review. York: HE Academy*.

Henderson, C., Connolly, M., Dolan, E. L., Finkelstein, N., Franklin, S., Malcom, S., ... & St. John, K. (2017). Towards the STEM DBER alliance: Why we need a discipline-based, STEM-education research community. *Journal of Geoscience Education*, *65*(3), 215-218.

Indorf, J. L., Benabentos, R., Daubenmire, P., Murasko, D., Hazari, Z., Potvin, G., ... & Stanford, J. S. (2021). Distinct factors predict use of active learning techniques by pre-tenure and tenured STEM faculty. *Journal of Geoscience Education*, *69*(4), 357-372.

Kortemeyer, G. (2020). Physics Education Research: a replicable model for Discipline-Based Educational Research at European universities?. *ETH Learning and Teaching Journal*, *2*(1), 137-146.

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le Roux, K., Taylor, D. L., Kloot, B., & Allie, S. (2021). Research on higher education: a perspective on the relations between Higher Education Studies and Discipline-Based Education Research. *Teaching in Higher Education*.

Shulman, L. (2001). From Minsk to Pinsk: Why a scholarship of teaching and learning?. *Journal of the Scholarship of Teaching and Learning*, 48-53.

Stains, M., Harshman, J., Barker, M. K., Chasteen, S. V., Cole, R., DeChenne-Peters, S. E., ... & Young, A. M. (2018). Anatomy of STEM teaching in North American universities. *Science*, *359*(6383), 1468-1470.

Wissman, K. T., & Leontyev, A. (2024). Awareness and Implementation of Evidence-Based Learning Strategies Among STEM Faculty. *Journal of College Science Teaching*, 1-10.

	Insufficient	**Good**	**Excellent**	**Where is this now? What needs to be done?**
Aim and problem	The contribution is insufficiently motivated and the question or problem formulation is incomplete or missing.	The question or problem is clearly formulated and the contribution is reasonably contextualised.	The question or problem formulation is clearly articulated and the contextualisation is relevant. The contribution has the potential to stimulate pedagogical discussion or development in higher education.	
Scholarly context	The connection to experience or research is missing or vague.	The contribution is connected to research or experience.	The contribution is explicitly situated and supported in relevant research or experience via clear reference to theories, approaches, and communities.	
Methods	Methods or approaches are not sufficiently accounted for or are not appropriate to the research question or target group.	The contribution describes appropriate methods and approaches but lack sufficient information to be replicable.	Methods or approaches are described and motivated relative to the question or problem formulation of the contribution. Methods are replicable.	
Findings	The accounts of results and data are missing or critically insufficient.	Results and data are accounted for in relation to the question or problem formulation.	Results and analyses of data are related to and develop the aim, the question or problem formulation, the methods, as well as the research and experience.	
Discussion and reflection	The results or experiences are not analysed or discussed in relation to the question or problem formulation.	The contribution contains discussion or reflection relative to the question or problem formulation.	Results and experiences are discussed in relation to the question or problem formulation. Critical connections or recommendations for future study are developed. The discussion contributes to a broader understanding of teaching and learning in Nordic STEM higher education.	
Communication	The contribution fails to argue and communicate in one or several of the following: audience adaptation, language, structure, or reference handling.	The contents of the contribution are well communicated and argued for. It is audience-adapted for accessibility in terms of language as well as structure. The contribution applies the APA style for referencing.	The content is well communicated and audience-adapted for accessibility in terms of language as well as structure. The argumentation is convincing and adapted in order not to exclude relevant groups. The contribution applies the APA style for referencing.	