

Call for Papers

Journal of Science Education and Technology

Special Issue: Transforming Issues-based Science Education with Innovative Technologies

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The *Journal of Science Education and Technology* (JOST) is soliciting manuscripts for a special issue that will feature **research on the use of technologies in support of issues-based science education**. Issues-based science education represents a suite of approaches for science teaching and learning that prioritizes contextualization of learning experiences in real-world issues that are societal problems. Issues based approaches include socio-scientific issues (SSI) teaching, context-based teaching, education for sustainability, and teaching to solve grand challenges (among other labels). Each approach emphasizes a specific dimension or focal point; for example, SSI teaching emphasizes ethical dimensions of issues while education for sustainability prioritizes environmental issues. However, all of these issues-based approaches center an issue as the context for learning and create opportunities for learners to build new understandings as they make sense of a complex issue.

Issues-based teaching has grown in prominence within the science education community (research and practice) over the last decade. Research on issues-based science teaching has provided evidence that these approaches can support student learning of science concepts, nature of science, science and engineering practices, and reasoning skills in addition to supporting character development, generating interest in learning, and more responsible engagement with modern media (Zeidler, 2014). At the same time, researchers have documented numerous ways in which issues-based science teaching has proven challenging to enact. Science teachers frequently report that while they support issues-based teaching, they feel ill-prepared to actually enact these approaches. They typically feel comfortable presenting science content but are often unsure of how to help their students deal with the social complexities presented by the issues (Avargil, Herscovitz & Dori, 2012). Educators often express concern associated with the instructional time necessary for issues-based teaching, how to ensure that course standards are adequately addressed, and how to support rich discourse in their classrooms when the topics can be controversial, and in some cases, polarizing (Hancock, Friedrichsen, Kinslow & Sadler, 2017). Other common challenges for issues-based teaching relate to assessment: teachers struggle to design and implement classroom assessments that adequately account for the learning that takes place in issues-based education and there are substantial differences between issues-based learning experiences and what is expected on most standardized, high stakes assessments (Tidemand & Nielsen, 2017).

These challenges are at least part of the reason why issues-based teaching is not more common in classrooms and other science learning environments. This gap between the positive potential of issues-based science education and the reality of science learning spaces creates opportunities for innovation. The purpose of this special issue is to explore ways in which educational technologies can be used to promote innovations that narrow this gap. Researchers, designers, and teachers are using a range of technologies to address the challenges that have, to this point, limited the proliferation of issues-based teaching. This special issue will bring together research and theory related to how technologies are being

leveraged to support issues-based teaching and the ways in which innovative uses of technology can address barriers to issues-based teaching. Technologies designed for student use such as virtual environments and simulations can support learner engagement with complex dimensions of issues that may be inaccessible with more traditional methods. Technology based teaching tools may provide educators with new ways of monitoring student learning and greater possibilities for providing feedback. Advances in information and media technologies can provide new ways in which both teachers and students consume and share their perspectives and knowledge building processes about ongoing issues.

For this special issue, we invite a variety of manuscript types including empirical investigations, theoretical explorations, reviews of existing research, and position papers. Regardless of the manuscript type, submissions should be robustly supported with evidence and/or theory. Whereas we encourage authors to discuss implications of their research for teaching and learning, the special issue will not publish manuscripts which have a primary purpose of just describing use of technologies for issues-based teaching. The purpose of the issue is to bring together scholarly contributions and diverse perspectives that explore the ways in which technologies are being leveraged to support issues-based teaching. We encourage submissions from researchers around the globe as our goal is to capture international advances in issues-based teaching and technologies. The following questions highlight themes that align well with the focus of the special issue; although, the list is certainly not complete.

- How can innovative technologies (e.g., computer-based games, virtual reality) be used to transform the ways in which learners engage in issues-based learning opportunities?
- What technologies can be leveraged to manage or ameliorate constraints perceived and experienced by teachers trying to enact issues-based instruction?
- How can technologies such as open education resources, online curriculum materials, and learning management platforms be leveraged to improve issues-based learning?
- In what ways can automated assessment support student reasoning and argumentation in the context of issue-based instruction?
- How can students productively use computational resources and tools to access and analyze “big data” essential for negotiating complex issues?

The review process will proceed in two phases. Authors are invited to submit an extended abstract for initial consideration by the guest editors. Extended abstracts should not exceed 1,000 words (excluding references). The editors will invite authors of abstracts that fit well with the special issue theme and expectations to submit a full manuscript. The full manuscripts should follow all JOST guidelines for submission and will be sent out for a full review. The guest editors will process reviewer feedback and make publication decisions. Not all manuscripts that have been invited following the consideration of extended abstracts will necessarily be published in the special issue. Inquiries about the special issue and the suitability of possible contributions can be directed to any of the Guest Editors via email.

Extended abstracts should be submitted through the following email: JOST_SI@hotmail.com

Timeline: Submission deadline for **extended abstracts: February 28, 2022**

Issue date for manuscript invitations: March 31, 2022

Submission deadline for invited manuscripts: July 31, 2022