

SEPTEMBER 2018



THE GER EXCHANGE

Promoting high-quality scholarly research in geoscience education.

Sept. 2018 Spotlight: Kathy Quardokus Fisher

The September 2018 [GER Spotlight](#) is Dr. Kathy Quardokus Fisher, Assistant Professor in the Department of Earth and Environment and the STEM Transformation Institute at the Florida International University. In this GER Spotlight, she discusses her work as a researcher of change in higher education and atmospheric science education. Check out the full [September 2018 Spotlight here!](#)



Featured Article

Understanding the development of interest and self-efficacy in active-learning undergraduate physics courses

"Modeling Instruction (MI), an active-learning introductory physics curriculum, has been shown to improve student academic success. Peer-to-peer interactions play a salient role in the MI classroom. Their impact on student interest and self-efficacy – preeminent constructs of various career theories – has not been thoroughly explored. Our examination of three undergraduate MI courses ($N=221$) revealed a decrease in students' physics self-efficacy, physics interest, and general science interest. We found a positive link from physics interest to self-efficacy, and a negative relationship between science interest and self-efficacy. We tested structural equation models confirming that student interactions make positive contributions to self-efficacy. This study frames students' classroom interactions within broader career theory frameworks and suggests nuanced considerations regarding interest and self-efficacy constructs in the context of undergraduate active-learning science courses."

Dou, R., Brewe, E., Potvin, G., Zwolak, J. P., & Hazari, Z. (2018). [Understanding the development of interest and self-efficacy in active-learning undergraduate physics courses](#). *International Journal of Science Education*, 1-19.

GER Division Bylaws Revision

The GER Division announces revisions to the bylaws. The original bylaws were ratified in 2014. Since then, the Division has grown and we are looking forward to adding two new positions to the Executive Board: Media Director and Graduate Student Liaison. Additionally, we have removed gendered pronouns from the bylaws, adjusted the language on term lengths, and modified the structure and duties of the communications committee. We hope these changes better serve the GER community and welcome feedback. Please review the new bylaws and provide feedback by visiting this page: https://nagt.org/nagt/divisions/geoed/ger_bylaws.html

Job and Internship Opportunities

- [Program Director for GeoSTEM](#), Jackson School of Geosciences, University of Texas at Austin
- Chair, Department of Geosciences, Middle Tennessee State University (review begins **September 3, 2018**; visit <http://mtsujobs.mtsu.edu>, posting number F386)
- [Assistant Professor of Mathematics, Science, Technology, or Cognitive Development Education](#), Graduate School of Education, University of California, Berkeley (deadline **September 21, 2018**)
- Postdoctoral research scholar in undergraduate STEM education research, Scientists Engaged in Education Research (SEER) Center, University of Georgia (review begins **September 30, 2018**; contact Tessa Andrews, tandrews@uga.edu, for details)
- [Midcareer Science & Technology Policy Fellowships](#), American Academy for the Advancement of Science (AAAS) (deadline **November 1, 2018**)

Short Course Announcement

Do your students struggle with the spatial thinking tasks that are ubiquitous in the geosciences? Have you wondered what you can do, as an instructor, to help your students develop facility at spatial thinking? The research is quite clear: Our students' spatial thinking skills -- even in courses for geoscience majors -- are extremely variable, and spatial thinking skills are malleable.

Nicole LaDue, Carol Ormand, and Tim Shipley are offering a half-day short course at GSA this year on *Strengthening Students' Spatial Thinking Skills*. This short course will focus on developing geoscience students' spatial thinking skills through research-based curricular materials. The course will focus on strategies and tools that support students with a range of spatial skills without imposing additional burdens on the instructor. The course will highlight two spatial learning principles: spatial feedback and spatial accommodation. Spatial feedback is feedback in the form of spatial information that allows students to see and correct any errors they made due to an incorrect mental

model. Spatial accommodation is the adjustment needed to revise mental models based on spatial feedback. This accommodation can be in the form of small adjustments to a mental model, significant reconstruction of an existing mental model, or development of an entirely new mental model. The course will review the cognitive science research related to spatial feedback and spatial accommodation and will show examples of curricular materials that incorporate these principles. Curricular materials will be suitable for a range of class sizes and course levels. Participants should come prepared with assignments that students find challenging. The second half of the short course will be work time to develop materials for providing spatial feedback to students working on these problems, in consultation with the leaders.

This short course will take place from 1-5 PM on Saturday, November 3rd. The cost is \$95. Register through GSA, in conjunction with your registration for the fall meeting: <https://community.geosociety.org/gsa2018/attendeeinfo/registration>.

Grant, Award, and Scholarship Deadlines

- GSA Geoscience Education Division [student travel grants](#) to present geoscience education work at the 2018 Annual Meeting (deadline **September 4, 2018**)
- NSF *Improving Undergraduate STEM Education: Pathways Into Geosciences* (letter of intent deadline **September 21, 2018**)
- NSF *Improving Undergraduate STEM Education: Education and Human Resources* (Exploration and Design Tier) (submission window **October 1, 2017-October 2, 2018**)
- NaEd/Spencer [Dissertation Fellowship Program](#) (deadline **October 4, 2018**)
- NaEd/Spencer [Postdoctoral Fellowship Program](#) (deadline **November 1, 2018**)
- Spencer Foundation [Small Research Grants](#) (deadline **November 1, 2018**)
- NSF *Improving Undergraduate STEM Education: Education and Human Resources* (Development and Implementation Tier) Full Proposal Deadline **December**

11, 2018

● NSF [ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers](#) "Partnerships" (letter of intent deadline **December 12, 2018**)

● NSF [Alliances for Graduate Education and the Professoriate \(AGEP\)](#) (full proposal deadline **December 14, 2018**)

Submit to the GER Exchange

NAGT-GER provides monthly updates on professional opportunities, funding, articles of note, researcher profiles, and other content of interest to our membership. Please consider [contributing items](#) of interest for inclusion in future editions of the Exchange!

For questions, or to join the GER Communications Committee, contact Communications Committee Chair [Kelsey Biting](#).



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This monthly email goes out to all GER Division members to share opportunities and ideas relevant to the community.

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