

# INTEGRATING SCIENCE COMMUNICATION MODULES INTO GRADUATE-LEVEL AGRICULTURAL & NATURAL RESOURCE SCIENCE COURSES



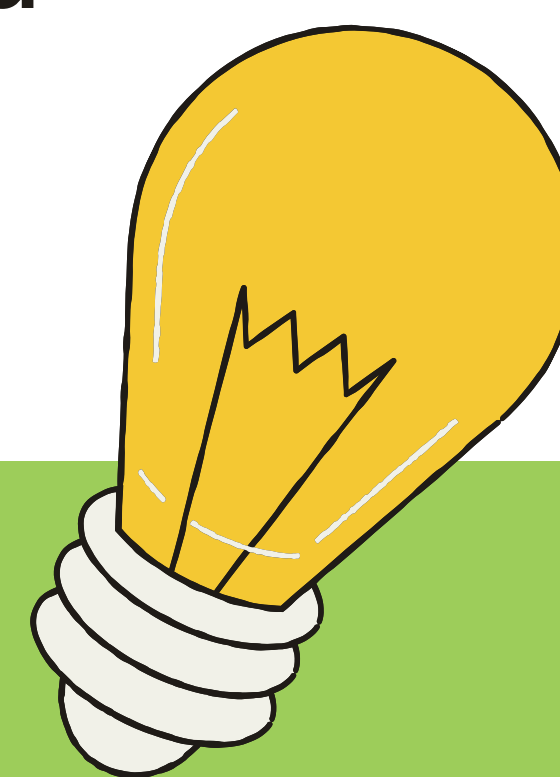
Garrett M. Steede, Ph.D., Rebecca D. Swenson, Ph.D., Lauri Baker, Ph.D., Sadie Hundemer, Ph.D., Hikaru Peterson, Ph.D., Ashley N. McLeod-Morin, Ph.D. & Troy D. McKay, Ph.D.

## INTRODUCTION

- Scientists, especially those at land-grant institutions working in food, agriculture, and natural resources, must be prepared to communicate their research effectively to secure funding, influence policy, and encourage technology adoption.
- Science communication training helps graduate students engage diverse audiences by using strategic media, dialogue, and activities to build understanding and interest in scientific topics.
- Although interest in science communication is growing, many agricultural science graduate programs lack formal instruction in these skills, prompting calls for integrating theory-based communication training into coursework.

## HOW IT WORKS

- A new set of 18 comprehensive science communication modules has been developed for graduate students in food, agricultural, natural, and human sciences, funded by a USDA Higher Education Challenge grant.
- The modules are designed for flexible use by faculty across disciplines, allowing integration of entire modules or individual components to fit specific curriculum needs.
- Each module includes a curriculum guide, lecture slides, readings, and assignments with rubrics, and can be delivered synchronously or asynchronously to support a range of teaching formats.



## FUTURE PLANS

- Future plans include further formal evaluation of each module to ensure relevant content is delivered at the appropriate level for the graduate student audience.
- All modules with resources will be made available online free of charge for any instructor to incorporate into their classroom.
- One institution additionally plans to leverage these modules as a framework for a graduate-level minor or certificate program in science communication.

## RESULTS TO DATE

- In 2024 and 2025, the science communication modules were piloted across graduate courses in four departments at three universities, including integration into both existing and newly developed curricula.
- Modules were successfully used in courses within agricultural and natural resource communication, as well as agricultural and applied economics programs.
- Faculty found the modules flexible, using them as either core weekly content or as supplemental materials in hybrid course formats.
- One instructor appreciated the ability to engage students online using the module activities, even if not used for graded assignments.
- Students highlighted the value of the asynchronous format, the balance of readings and videos, and the usefulness of the materials both during and after the course.
- An instructor from outside the communication discipline found the data visualization module especially helpful, noting it saved preparation time and filled gaps left by traditional disciplinary training.

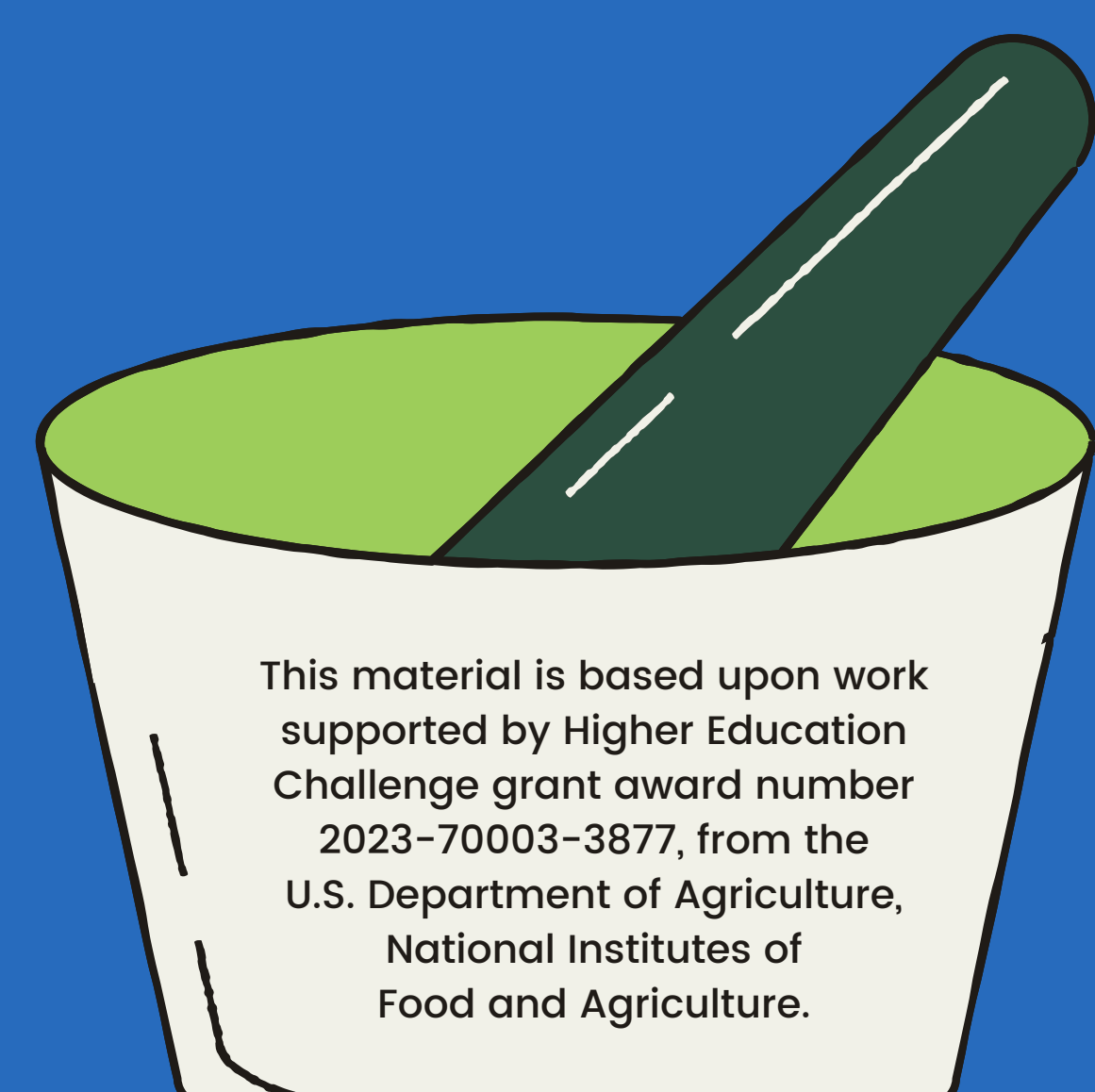


UNIVERSITY OF MINNESOTA

- MODULE 1: INTRODUCTION TO SCIENCE COMMUNICATION
- MODULE 2: COMMUNICATION THEORY
- MODULE 3: CONCEPTS OF STRATEGIC SCIENCE COMMUNICATION
- MODULE 4: ISSUE-BASED COMMUNICATION
- MODULE 5: ETHICS IN SCIENCE COMMUNICATION
- MODULE 6: RESEARCH IN SCIENCE COMMUNICATION
- MODULE 7: RESEARCH METHODS IN SCIENCE COMMUNICATION
- MODULE 8: AUDIENCE ANALYSIS
- MODULE 9: COMMUNICATION EVALUATION
- MODULE 10: DATA ANALYSIS
- MODULE 11: DATA VISUALIZATION
- MODULE 12: NEW MEDIA
- MODULE 13: WRITTEN COMMUNICATION
- MODULE 14: ORAL COMMUNICATION
- MODULE 15: MEDIA SKILLS
- MODULE 16: VISUAL DESIGN & PHOTOGRAPHY
- MODULE 17: AUDIO STORYTELLING
- MODULE 18: VIDEOGRAPHY

## REFERENCES

- Bennett, N., Dudo, A., Yuan, S., & Besley, J. (2019). Scientists, trainers, and the strategic communication of science. In *Theory and best practices in science communication training* (pp. 9-31). Routledge.
- Brownell, S. E., Price, J. V., & Steinman, L. (2013). Science communication to the general public: why we need to teach undergraduate and graduate students this skill as part of their formal scientific training. *Journal of undergraduate neuroscience education*, 12(1), E6.
- Dudo, A., Besley, J. C., & Yuan, S. (2021). Science communication training in North America: Preparing whom to do what with what effect?. *Science Communication*, 43(1), 33-63.
- McLeod-Morin, A., Peterson, H.H., Baker, L., Steede, G. M., Hundemer, S., Swenson, R. D., & McKay, T. D. (2024). Show us your skills: Exploring the science communication landscape in graduate education. *Journal of Applied Communications*, 108(4). doi.org/10.4148/1051-0834.2570
- McLeod-Morin, A., Rumble, J. N., & Telg, R. W. (2021). Challenges and motivations of science communication: An administrative perspective at Land-Grant Universities. *Journal of Applied Communications*, 105(3). <https://doi.org/10.4148/1051-0834.2387>
- Swenson, R. & Marson, C. (2024) Perceptions of science communication's domain, practices, and identity: What concerns members on the peripheral edge of a community of practice. *Journal of Applied Communications*, 108(1). <https://doi.org/10.4148/1051-0834.2498>



This material is based upon work supported by Higher Education Challenge grant award number 2023-70003-3877, from the U.S. Department of Agriculture, National Institutes of Food and Agriculture.