

# Ryan G. Summers

## CURRICULUM VITAE

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### EDUCATION

Ph.D. Curriculum and Instruction 2016  
University of Illinois at Urbana-Champaign  
Dissertation: *A Statewide Examination of Illinois Students' Attitudes toward Science in Grades 5-12*. Advisor and dissertation director: Fouad Abd-El-Khalick

M.S. Curriculum and Instruction 2012  
University of Illinois at Urbana-Champaign

B.S. Biological Sciences 2007  
Eastern Illinois University  
Minor: Chemistry  
Teacher Certification

### PROFESSIONAL APPOINTMENTS

Associate Professor 2022 – Present  
College of Education and Human Development

Assistant Professor 2016 – 2022  
College of Education and Human Development

Graduate Faculty 2016 – Present  
School of Graduate Studies

### TEACHING

#### Graduate Level Courses

*TL 577 Assessment of Learning*, Spring 2017 – 2023  
Facilitated a graduate course organized in seminar-style (face-to-face delivery in Spring 2017 and hybrid delivery with synchronous sessions in Spring 2018 and 2019).

*TL 556 Constructivism in STEM Education* Fall 2021, Spring 2023, Fall 2023  
Facilitated a graduate course organized in seminar-style (online delivery).

*TL 555 Issues of Motivation and Equity in STEM Education* Spring 2022, 2023  
Facilitated a graduate course organized in seminar-style (online delivery).

*TL 554 Nature of Science and Science Education* Spring 2021, Fall 2022  
Facilitated a graduate course organized in seminar-style (online delivery).

*TL 590 Specialized Methods and Materials: Science* Fall 2019, Fall 2020  
Facilitated a science education methods courses for teacher candidates at the graduate level (online delivery).

*TL 580 Graduate Field Experience – Science,* Spring 2017, Fall 2019, 2020, 2021  
Supervised a graduate student in a 30-hour field placement experience in a high school science setting.

*TL 542 Models of Teaching* Fall 2018, 2020, 2021  
Facilitated a graduate course organized in seminar-style with a hybrid delivery format for face-to-face and distance learners in synchronous sessions.

*TL 518 Science in the Elementary School,* Fall 2017  
Facilitated a graduate course organized in bi-weekly synchronous sessions with an online delivery format.

### **Undergraduate Level Courses**

*TL 400 Secondary Methods and Materials – Science,* Fall 2016 – Present  
Required course for undergraduate secondary science education teacher candidates delivered in a face-to-face format.

*TL 401 School Safety Science* Fall 2017 – Present  
Co-requisite for TL 400 for undergraduate secondary science education teacher candidates delivered in an online format.

*TL 486 Field Experience – Science,* Fall 2016 – Present  
Co-requisite field experience for TL 400. Teacher candidates complete 60 hours in a middle or high school classroom under the supervision of a cooperating classroom teacher and the course instructor.

## **ACADEMIC SERVICE**

### **Service to the Department**

*Program Area Coordinator,* 2017 – 2018, 2021 – Present  
Undergraduate Secondary Education Program Area

*Committee Member,* 2016 – Present

Middle and Secondary Education Program Area Committee

*Committee Member,* 2019 – Present  
UND Teaching & Leadership Master’s Program Committee

*Committee Member,* 2020 – Present  
Teaching & Leadership Ph.D. Program Committee

*Committee Member,* 2016 – Present  
Teaching & Learning Ph.D. Program Committee

*Committee Member, Ad hoc, Appointed* 2022 – 2023  
Search for Teaching, Leadership, and Professional Practice Department Chair

*Committee Member, Ad hoc, Appointed* 2022 – 2023  
Search for STEM Education Research Faculty

*Committee Member, Ad hoc, Appointed* 2022 – 2023  
Search for Elementary Science Teacher Education Faculty

*Committee Member, Ad hoc, Appointed* 2022 – 2023  
Search for Middle Level and Secondary Math Teacher Education Faculty

*Committee Member, Ad hoc, Appointed* 2021 – 2022  
Search for Educational Leadership Clinical Assistant Professor

*Committee Member, Ad hoc, Appointed* 2021 – 2022  
Search for Math Teacher Education Faculty

*Committee Co-chair, Ad hoc, Appointed* 2019 – 2020  
Search for Math Teacher Education Faculty

*Committee Member,* 2016 – 2019  
Curriculum & Instruction Master’s Program Committee

*Committee Member, Ad hoc, Appointed* 2018 – 2019  
Search for Math Teacher Educator

*Committee Member, Ad hoc, Appointed* 2016 – 2017  
Search for Elementary Science Teacher Education Faculty

<i>Committee Member, Ad hoc, Appointed</i> Taskforce Reviewing Undergraduate Teacher Education Field Experiences (TL 486)	2016
<i>Graduate Committee Member, Ad hoc, Appointed</i> Search for UIUC Curriculum and Instruction Department Head	2014
<b>Service to the College</b>	
<i>Committee Member, Elected,</i> CEHD Promotion & Tenure Committee (Tenured Representative)	2024 – Present
<i>Faculty Member, Appointed,</i> CEHD Bureau of Evaluation and Research Services (BEARS)	2021 – Present
<i>Committee Member, Elected,</i> CEHD Student Appeals and Academic Grievances Committee	2023 – 2024
<i>Faculty Member, Appointed,</i> CEHD Teacher Recruitment and Retention Initiative	2022 – 2024
<i>Committee Member, Elected,</i> CEHD Strategic Enrollment, Recruitment, and Marketing	2021 – 2022
<i>Committee Member, Elected,</i> CEHD Research and Faculty Development	2017 – 2020
<i>Committee Member, Ad hoc, Appointed,</i> Data Core Advisory and Working Group	2020 – 2021
<i>Committee Member, Ad hoc, Appointed,</i> NDACTE Taskforce for Reviewing Basic Skills Requirements and Praxis I Use	2019 – 2020
<i>Committee Member, Ad hoc, Appointed,</i> Search for CEHD Associate Dean for Student Services and Assessment	2019
<i>Poster Judge,</i> CEHD Annual Research Fair	2017
<i>Committee Member, Ad hoc, Elected,</i> Search for CEHD Associate Dean for Research	2017

**Service to the University**

*Committee Member, Standing, Appointed,* 2017 – Present  
Teacher and School Professionals Education Committee (TSPEC)

*Committee Member, Standing, Elected,* 2022 – Present  
Senate Conflict of Interest/Scientific Misconduct Committee

*Committee Member, Ad hoc, Appointed,* 2022  
Student Success through Academic Excellence Strategic Plan Workgroup

*Committee Member, Ad hoc, Appointed,* 2020  
Data Literacy Taskforce

*Faculty Tour Guide,* 2018  
New Student Orientation for First Generation College Students

**SERVICE TO THE PROFESSIONAL COMMUNITY****National Committee Service**

*Committee Member, Standing, Appointed,* 2023 – Present  
NSTA Research Committee

*Committee Member, Standing, Appointed,* 2022 – Present  
ASTE Membership and Participation Committee

*Executive Board Member, Elected,* 2020 – 2022  
Northern Rocky Mountain Educational Research Association (NRMERA)

*Strand coordinator, Appointed,* 2021 – 2022  
ASTE History, Philosophy, and Nature of Science Strand

NARST Research Committee,  
*Chair,* 2019 – 2020  
*Co-chair,* 2018 – 2019  
*Committee Member,* 2017 – 2018

*Committee Member,* 2019  
Search for Editorial Team for the *Journal of Research in Science Teaching*

**External Funding Review**

Invited Merit Review Panelist, 2023  
National Institute of Health (NIH)

Invited Expert Panelist (Education),  
National Science Foundation (NSF) 2023

Invited Merit Review Panelist,  
National Science Foundation (NSF) 2020

### **Editorial Responsibilities**

Associate Editor,  
*School Science and Mathematics* 2021 – Present

Editorial Board,  
*International Journal of Science Education* 2022 – Present

Invited Reviewer,  
*International Journal of Research in Education and Science (IJRES)* 2020 – Present  
*Science & Education* 2018 – Present  
*Public Library of Science (PLOS) ONE* 2018 – Present  
*Canadian Journal of Science, Mathematics and Technology Education* 2018 – Present  
*Teaching and Teacher Education* 2017 – Present  
*Journal of Research in Science Teaching* 2015 – Present  
*International Journal of Science Education* 2014 – Present  
*Journal of Science Education and Technology* 2013 – Present

Occasional Reviewer,  
NARST Strand 2 2012 – Present  
Science Learning: Contexts, Characteristics, and Interactions. Learning environments, teacher-student and student-student interactions, and factors related to and/or affecting learning. Annual meeting of the National Association for Research in Science Teaching.

NARST Strand 13 2012 – Present  
History, Philosophy, and Sociology of Science. Historical, philosophical, and social issues of science as related to science education. Annual meeting of the National Association for Research in Science Teaching.

### **Professional Memberships**

American Educational Research Association (AERA)  
The Association for Science Teacher Education (ASTE)  
National Association for Research in Science Teaching (NARST)  
National Science Teaching Association (NSTA)

School Science and Mathematics Association (SSMA)

## SERVICE TO THE COMMUNITY

<i>Judge,</i> Regional Science and Engineering Fair, Grand Forks, ND	2024
<i>Head Judge,</i> North Dakota State Science and Engineering Fair, Grand Forks, ND	2022
<i>Presenter,</i> STEM Professional Development Workshop for Rock Creek Grant Teachers College of Education and Human Development, Grand Forks, ND	2021
<i>Presenter,</i> The Usefulness and Importance of Models in Science Teaching and Learning North Dakota State Science and Engineering Fair, Grand Forks, ND	2018
<i>Presenter,</i> Models and Modeling in Science North Dakota State Science and Engineering Fair, Grand Forks, ND	2017
<i>Presenter,</i> Exploring Middle and Secondary Education Northern Valley Career Expo, Grand Forks, ND	2016

## PUBLICATIONS

(\*indicates collaboration with graduate students, +indicates collaboration with undergraduate students,  
^indicates collaboration with K-12 teachers)

### Refereed Research Articles

**Summers, R.** (2024). Appraising Instructional Materials from TeachersPayTeachers for Features of NGSS Design and Nature of Science Representations. *Research in Science Education, 54*(3), 523-546.

Taylor, J., Bowen, G. M., Patrick, T., **Summers, R.**, Kubsch, M., Warfa, A., Sezen Barrie, A., Guzey, S., LaChapelle, C. (accepted). Crossing boundaries between research and practitioner communities: The role of research use and cross-community journal authorship. *Journal of Research in Science Teaching*.

Abd-El-Khalick, F., **Summers, R.**, Brunner, J., Myers, J., & Belarmino, J. (accepted). Development and validation of *VAScoR*: A rubric to qualify and quantify responses to the

Views of Nature of Science (VNOS) questionnaire. *Journal of Research in Science Teaching*.

**Summers R., & Wang, S.** (2023). Measuring a cross-sectional sample of students' intentions to engage with science and modelling associations according to two theoretical perspectives. *International Journal of Science Education*, 45(7), 521-540.

**Summers R.** (2021). A mixed methods exploration of secondary students' attitudes and intentions in relation to elective science course enrollment. *School Science and Mathematics*, 121(7), 395-407.

**Summers, R., Alameh, S., Brunner, J., Maddux, J., Wallon, R., & Abd-El-Khalick, F.** (2019). Representations of nature of science in U.S. science standards: A historical account with contemporary implications. *Journal of Research in Science Teaching*, 56(9), 1234-1268.

**Summers, R., & Abd-El-Khalick, F.** (2019). An examination of Illinois students' attitudes toward science using multivariate multi-level modeling to analyze a cross-sectional sample of responses from grades 5 through 10. *Journal of Research in Science Teaching*, 56(8), 1106-1134.

**Summers, R., Wang, S., Abd-El-Khalick, F., & Said, Z.** (2019). Comparing Likert scale functionality across culturally and linguistically diverse groups in science education research: An illustration using Qatari students' responses to an attitude toward science survey. *International Journal of Mathematics and Science Education*, 17(5), 885-903.

**Summers, R., & Abd-El-Khalick, F.** (2019). Examining the Representations of NOS in Educational Resources: An Analysis of Lesson Plans Aligned with the Next Generation Science Standards. *Science & Education*, 28, 269-289.

**Summers, R., Rodems, K., Denos, S., & Atkinson, A.** (2019). Using claims and evidence to support the search for extraterrestrial life: Teacher reflections following an interdisciplinary English–science argumentation unit. *Middle School Journal*, 50(2), 5-16.

**Summers, R., & Abd-El-Khalick, F.** (2018). Development and validation of an instrument to assess student attitudes toward science across grades 5 through 10. *Journal of Research in Science Teaching*, 55, 172-205.

Abd-El-Khalick, F., Myers, J., **Summers, R.**, Waight, N., Belarmino, J., Brunner, J., Wahbeh, N., & Zeineddin, A. (2017). A longitudinal analysis of the extent and manner of representations of nature of science in U.S. high school biology and physics textbooks. *Journal of Research in Science Teaching*, 54, 82-120.

Said, Z., **Summers, R.**, Abd-El-Khalick, F., & Wang, S. (2016). Attitudes toward science among grades 3 through 12 Arab students in Qatar: Findings from a cross-sectional national study. *International Journal of Science Education*, 38(4), 621-643.

Abd-El-Khalick, F., **Summers, R.**, Said, Z., Wang, S., & Culbertson, M. (2015). Development and large-scale validation of an instrument to assess Arabic-speaking students' attitudes toward science. *International Journal of Science Education*, 37(16), 2637-2663.

### **Manuscripts under review**

\*Boz, T., Lee, M., Macias, M., **Summers, R.**, Zaman, M., Inouye, M., Robinson, J., Hammack, R. J. (2024, under review). "I felt like I met people, like actually met people": Large-Scale Online STEM Professional Learning for Rural Teachers. *Computers and Education*.

\*Wang, S., Chen, S., **Summers, R.** (2024, under review). Analyzing students' intentions to engage with science in the future using outlook profiles based on their attitudes and beliefs.

### **Manuscripts in preparation**

**Summers, R.** (in preparation). Assessing teacherpreneurship: A case of for-profit materials misrepresenting science ideas and practices. *The Science Teacher*.

\*<sup>^</sup>Ries, K., & **Summers, R.** (in preparation). Supporting early career teachers' selection of instructional materials when planning to incorporate NOS ideas in elementary classrooms. *American Educator*.

### **Book Chapters**

**Summers, R.** (2023). Fostering preservice science teachers' global awareness through a socio-scientific issues approach set in the context of COVID-19. In V. Akerson, G. A. Buck, & V. Dimitrieska (Eds.) *Internationalizing rural science teacher preparation: Action research for global competency*. Springer.

<sup>^</sup>**Summers, R.**, Rodems, K., Denos, S., & Atkinson, A. (2020). Using claims and evidence to support the search for extraterrestrial life: Teacher reflections following an interdisciplinary English–science argumentation unit. In K. Brinegar, L. Harrison, & E.

Hurd (Eds.) *Integrative and interdisciplinary curriculum in the middle school: Integrated approaches in teacher preparation and practice*. New York, NY: Routledge. (Note: Previously published in the *Middle School Journal* and selected for inclusion in this monograph.)

Lederman, N., Abd-El-Khalick, F., **Summers, R.**, & LePretre, D. (2020). *Connections to Nature of Science* (Chapter 7). In T. Willard (Ed.) *NSTA Atlas of the Three Dimensions*. NSTA Press.

Abd-El-Khalick, F., Belarmino, J., Brunner, J., Le, A., Myers, J. Y., **Summers, R.**, Wahbeh, N., Waight, N., Waters, M., & Zeineddin, A. (2017). *A longitudinal analysis of the prominence and representations of nature of science in U.S. high school chemistry, biology, and physics textbooks*. In C. McDonald & F. Abd-El-Khalick (Eds.), *Representations of nature of science in school science textbooks: Global perspectives*. New York: Routledge.

### **Commissioned Work and Reports**

Abd-El-Khalick, F., Lederman, N., **Summers, R.**, & LePretre, D. (2018). *Review of NOS Maps and Briefs in Development for the NSTA Atlas of the Three Dimensions*. Report prepared for Ted Willard, National Science Teachers Association. (Note: Contributions later published in the *NSTA Atlas of the Three Dimensions*.)

Abd-El-Khalick, F., & **Summers, R.** (2010). *Science curriculum framework mapping for grades 1–10: Nile Egyptian Schools versus the Finnish National Science Curriculum*. Report prepared for the Nile Egyptian Schools, A Project with the Education Development Fund of Egypt, Cairo, Egypt.

### **Indexed Conference Proceedings**

\*Hammack, R., Robinson, J., Boz., T., Lee, M. J., **Summers, R.**, Iveland, A., Inouye., M., Macias, M., Zaman, M., Galisky, J., Johansen, N., Ringstaff, C. (2024, June). Supporting Elementary Engineering Instruction in Rural Contexts Through Online Professional Learning and Modest Supports. Paper presented at the annual meeting of the American Society for Engineering Education (ASEE).

### **Practitioner Articles**

\*Zaman, M., **Summers, R.**, Boese-Noreen, S. (2024, March). Elevating ELLs in a science classroom: Evidence-informed strategies to support language development used by a high school teacher. The official publication of Teachers of English as a Second Language Association of Ontario, *Contact Magazine*.

### **Public and Community Publications**

**Summers, R.** (2024, August 21). *Politicians step up attacks on the teaching of scientific theories in US schools*. The Conversation. Retrieved from <  
<https://theconversation.com/politicians-step-up-attacks-on-the-teaching-of-scientific-theories-in-us-schools-235083>>

**Summers, R.** (2020, December). Op-Ed: Remote instruction in K-12 schools is a stopgap. *Grand Forks Herald, Fargo Inforum, and Bismarck Tribune*.

## RESEARCH PAPERS AND CONFERENCE PRESENTATIONS

(\*indicates collaboration with graduate students, +indicates collaboration with undergraduate students,  
^indicates collaboration with K-12 teachers)

\***Summers, R.**, Iveland, A., Hammack, R., Macias, M., Galisky, J., & Herbert, M. (2025, under review). *Supporting Elementary Teachers' Self-Efficacy in Science and Engineering through a Year-Long Professional Learning Program*. Paper submitted for presentation at the NARST Annual International Conference, National Harbor, MD.

**Summers, R.**, Lee, M., Inouye, M., Hammack, R., & Macias, M. (2025, under review). *Delivering Formative Assessment and Reflecting on Student Learning as Components of Elementary Teacher Professional Learning*. Paper submitted for presentation at the annual conference of the Association for Science Teacher Education (ASTE), Long Beach, CA.

\*Galisky, J., Macias, M., Iveland, A., Inouye, M., Hammack, R., Robinson, J., Ringstaff, C., & **Summers, R.** (2024, March). *Science professional learning that offers opportunities for growth in engineering self-efficacy for rural school elementary teachers*. Paper presented at the NARST Annual International Conference, Denver, CO.

\*Chen, S., Wang, S., **Summers, R.** (2024, March). *Analyzing students' future intentions using outlook profiles based on attitudes toward science and associated beliefs*. Paper presented at the NARST Annual International Conference, Denver, CO. [Online Presentation.]

\***Summers, R.**, Iveland, A., Hammack, R., Inouye, M., Robinson, J., Macias, M., Boz, T., Lee, M. J., Galisky, J., & Ringstaff, C. (2024, January). *Offering Rural Elementary Teachers Modest Supports to Sustain Professional Development Outcomes in Science and Engineering*. Paper presented at the annual conference of the Association for Science Teacher Education in New Orleans, LA.

Abd-El-Khalick, F., **Summers, R.**, & Brunner, J. (2023, April). *Development of a Rubric to Qualify and Score Responses to the Views of Nature of Science (VNOS) Questionnaire*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

**Summers, R.,** Wayt, J., Burns, R., Ostrom-Blonigen, J., & Rusch, K. A. (2023, January). *Investigating Teachers, Administrators, and Families Perspectives on STEM Education in North Dakota with a Focus on Indigenous Communities*. Paper presented at the annual conference of the Association for Science Teacher Education in Salt Lake City, Utah.

Brunner, J., & **Summers, R.** (2022, March). *How teachers used the COVID-19 pandemic to teach how science works*. Paper presented at the NARST Annual International Conference in Vancouver, British Columbia, Canada.

Abd-El-Khalick, F., **Summers, R.,** Brunner, J., Myers, J., & Belarmino, J. (2022, March). *Development and Validation of a Rubric to Qualify and Quantify Responses to the VNOS Questionnaire*. Paper presented at the NARST Annual International Conference in Vancouver, British Columbia, Canada.

\*<sup>^</sup>**Summers, R.,** Nelson, J., & Dickerman, L. (2022, January). *Appraising nature of science instructional materials from TeachersPayTeachers for the middle grades with a focus on NGSS alignment*. Paper presented as a Round Table Discussion to the annual conference of the Association for Science Teacher Education in Greenville, South Carolina.

\*<sup>^</sup>Dickerman, L., Nelson, J., & **Summers, R.** (2021, October). *Exploring teachers' selection of instructional materials for science lesson planning*. Poster presented at the annual meeting of Northern Rocky Mountain Educational Research Association to be held in Sun Valley, Idaho.

**Summers, R.,** & Brunner, J. (2021, October). *Gauging the importance placed on developing teachers understanding of nature of science by analyzing science methods course syllabi*. Paper presented at the annual meeting of Northern Rocky Mountain Educational Research Association to be held in Sun Valley, Idaho.

Taylor, J., Bowen, G. M., Patrick, T., **Summers, R.,** Kubsch, M., Warfa, A., Sezen Barrie, A., Guzey, S., LaChapelle, C. (2021, April). *Translating Research into Classroom Practice: Who is citing what in Science Education Practitioner Journals (SEPJ)s?*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, Florida. [Conference changed to virtual delivery due to COVID-19]

**Summers, R.,** & Brunner, J. (2021, January). *Examining pre-service science teacher methods courses to better understand the on-going challenges with improving teachers' understandings of NOS*. Paper presented at the annual meeting of the Association of Science Teacher Education, Salt Lake City, Utah. [Conference changed to virtual delivery due to COVID-19]

Bowen, G. M., Taylor, J., Patrick, P., **Summers, R.,** Kubsch, M., Warfa, A., Sezen Barrie, A., Guzey, S., LaChapelle, C. (2020). *Understanding the use of academic research in science education practitioner journals*. Paper accepted for presentation at the Science Education Research Group for the annual conference of the Canadian Society for the

Study of Education, London, Ontario. [Presentation scheduled 1 June 2020 canceled due to COVID-19. Abstract published in the *Journal of the Canadian Association for Curriculum Studies*]

Taylor, J., Bowen, G. M., Patrick, T., **Summers, R.**, Kubsch, M., Warfa, A., Sezen Barrie, A., Guzey, S., LaChapelle, C. (2020). *Translating research into classroom practice: Examining the use of research in science education practitioner journals (SEPs)*. Paper accepted for presentation at the annual meeting of the National Association for Research in Science Teaching, Portland, OR. [Presentation scheduled 17 March 2020 canceled due to COVID-19]

**Summers, R.**, Abd-El-Khalick, F., & Brunner, J. (2020). *Evidence and rationale for expanding The Views of Nature of Science Questionnaire*. Paper accepted for presentation at the annual meeting of the National Association for Research in Science Teaching, Portland, OR. [Presentation scheduled 17 March 2020 canceled due to COVID-19. Conference paper available through University of North Dakota Scholarly Commons]

**Summers, R.**, Wang, S., & Hutchison, A. (2019, April). Exploring students' intentions to engage with science: A side-by-side comparison of two theoretical models. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

**Summers, R.** (2018, March). *What led me here? An exploration into secondary students' attitudes and intentions in relation to elective course enrollment*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Atlanta, GA.

Henderson, J. A., Greer, R. P., **Summers, R.**, & Morphew, J. W. (2017, June). *Engagement in Practice: Successes Gleaned from the St. Elmo Brady STEM Academy*. Paper presented at the annual meeting of the American Society for Engineering Education, Columbus, OH.

**Summers, R.**, Alameh, S., Brunner, J., Maddux, J., Wallon, R., & Abd-El-Khalick, F., (2017, April). *Nature of science treatment in U.S. science standards: A historical account with contemporary implications*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Antonio, TX.

**Summers, R.**, Maddux, J., Wallon, R., Alameh, S., Brunner, J., Myers, J., Pabuccu, A., Akyol, G., Silliman, C., Shehab, S., & Abd-El-Khalick, F. (2016, April). *The history of nature of science representation in state science standards: A systematic assessment*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

Brunner, J. L., **Summers, R.**, Myers, J. Y., & Abd-El-Khalick, F. (2016, April). *Toward quantifying responses to the Views of Nature Of Science Questionnaire: Empirically investigating qualitative coding*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

**Summers, R., & Abd-El-Khalick, F.** (2016, April). *A cross-sectional investigation into Illinois students' attitudes toward science using multi-level modeling*. Paper presented at the annual meeting of the American Educational Research Association, Washington, D.C.

**Summers, R.** (2015, October). *A statewide examination of attitudes toward science among Illinois students in grades 5-12*. Paper presented at the Focus on Illinois Education Research Symposium, Lisle, IL.

**Summers, R., & Abd-El-Khalick, F.** (2015, April). *Cross-sectional study of Illinois students' attitudes toward science*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Chicago, IL.

**Summers, R., Abd-El-Khalick, F., Said, Z., & Culbertson, M.** (2014, March-April). *Assessment of Precollege Qatari Students' Attitudes toward Science*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Pittsburgh, PA.

Abd-El-Khalick, F., Belarmino, J., Myers, J., **Summers, R., & Brunner, J.** (2013, April-May). *Views of nature of science (VNOS) questionnaire: development and validation of a scoring rubric*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Said, Z., Abd-El-Khalick, F., **Summers, R., & Culbertson, M.** (2013, April-May). *Development and validation of an instrument to assess grade 3 through 12 Arab students' attitudes toward science*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Said, Z., Abd-El-Khalick, F., **Summers, R., Culbertson, M., & Friesen, H.** (2013, April). *Large-scale validation of an instrument to assess precollege students' attitudes toward science*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Rio Grande, Puerto Rico.

**Summers, R., Abd-El-Khalick, F., Said, Z., Friesen, H., & Culbertson, M.** (2012, October). *Development and validation of an instrument to assess Arabic speaking students' attitudes toward science*. Paper presented at the annual meeting of the Qatar National Research Foundation, Doha, Qatar.

**Summers, R., Abd-El-Khalick, F., Said, Z., Friesen, H., & Culbertson, M.** (2012, March). *Development and validation of an instrument to assess Arabic speaking students'*

*attitudes toward science*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Abd-El-Khalick, F., Belarmino, J., & **Summers, R.** (2012, March). *Development and validation of a rubric to score the views of nature of science questionnaire*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

### **Conference Sessions: Symposia and Panel Discussions**

Park, W., **Summers, R.**, Pleasants, J., Brock, R., Isozaki, T., Tsybulsky, D., Pshenichny-Mamo, A., Simon, H. B., Özer, F., Han-Tosunoğlu, C., Bogdan Toma, R., Levrini, O., Caramaschi, M., Satanassi, S., Kremer, K., Schmidt, E., Gurgel, I., Pietrocola, M., & Adúriz-Bravo, A. (2025, under review). Nature of science symposium. In W. Park, **R. Summers** & J. Pleasants (Session Organizers), Strand 13 Sponsored Session. Panel discussion submitted for consideration at the annual meeting of the National Association for Research in Science Teaching, National Harbor, MD.

**Summers, R.** (2023, April). Globalizing STEM in Rural Teacher Education Programs. V. Akerson, G. A. Buck, & V. Dimitrieska (Session Organizers), Strand 7 Symposium. Panel discussion at the annual meeting of the National Association for Research in Science Teaching, Chicago, IL.

**Summers, R.**, Vo, T., Siry, C., Leak, A., Lo, S., Atwater, M., Allen, C., Owens, D., Lederman, N., & Marshall, S. (2020). Impacting Practice through Science Education Research: Communicating Within and Across Places, Contexts, and Communities. In R. Summers & T. Vo (Session Organizers), Research Committee Symposium. Panel discussion at the annual meeting of the National Association for Research in Science Teaching, Portland, OR. [Presentation scheduled 17 March 2020 canceled due to COVID-19]

Boda, P. A., **Summers, R.**, Steinberg, S. R., Parker, C. A., Chinn, P. W. U., Chen, Y.-C., Tippins, D. J., Vo, T., Rodriguez, A. J. Adams, J., Tal, T., & Kahn, S. (2019, April). Embodying Collective Activism in Science Education Research: Philosophies, Praxis, and Pragmatics. In P. Boda & R. Summers (Session Organizers), *Research Committee Symposium*. Administrative session at the annual meeting of the National Association for Research in Science Teaching, Boston, MA

### **Conference Sessions: Workshops**

Philipp, S., **Summers, R.**, Boda, P., Angelone, L., & Yin, X. (2021, May). *Balancing act: Bridging content pedagogy with equity issues in methods courses*. Virtual hands-on workshop presented at an Association of Science Teacher Education (ASTE) sponsored session during National Science Teaching Association (NSTA) Engage Spring 2021.

**Summers, R.,** Philipp, S., Wygant, H., Angelone, L., Pitot, L., Hagevik, R., Yin, X., & Perkins Coppola, M. (2021, January). *Methods for Secondary Science Education Methods*. Workshop presented at the annual meeting of the Association of Science Teacher Education, Salt Lake City, Utah. [Conference changed to virtual delivery due to COVID-19]

## STATE AND REGIONAL CONFERENCE PRESENTATIONS

**Summers, R.,** Robinson, J., & Lee, M. J. (2024, April). *Combining Online Professional Learning and Modest Supports to Improve Science and Engineering Teaching in Rural Schools*. Poster presented at the annual research fair hosted by the College of Education and Human Development, Memorial Union, University of North Dakota, Grand Forks.

Inouye, M., Hammack, R., Robinson, J., Boz, T., Lee, M., **Summers, R.,** Iveland, A. (2024, March). *The Rural Community Walk: A strategy to deepen understanding of your unique teaching context to support authentic, relevant instruction*. Presented at the University of Wyoming, College of Education Summit, Laramie, Wyoming.

\*Zhao, J. X., Wu, Y., Sun, D., Okosun, B., Xue, Y., Baird, J., **Summers, R.,** & Darland, D.C. (2023, August). *Science, Technology, Engineering, and Mathematics—Module*. Nurturing STEM in the PreK-12 Classroom (Oral Presentation), Memorial Union, University of North Dakota, Grand Forks.

\*Zhao, J. X., Wu, Y., Sun, D., Okosun, B., Xue, Y., Baird, J., **Summers, R.,** & Darland, D.C. (2023, August) *Science and Scale from Atoms to Ecosystems*. Nurturing STEM in the PreK-12 Classroom (Poster Presentation, Exhibition, and Demonstration), Memorial Union, University of North Dakota, Grand Forks.

\*<sup>^</sup>Ries, K., & **Summers, R.** (2023, April). *Nature of science and trade books*. Paper presented at the annual meeting of the North Dakota Association for Colleges of Teacher Education (NDACTE), Mayville, ND.

\*Zaman, M., Baird, J., & **Summers, R.** (2023, March). *Mentoring Early Career Teachers and Supporting North Dakota Schools through the Rural Student Teaching Experience: Participant Profiles from Fall 2021 to Spring 2023*. Poster presented at the annual conference of the North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR), Fargo, ND.

\***Summers, R.,** Walch, T., Kelliher, A., Robinson, J., Bhatta, A., Basson, M., Warne, D., & Navarro, R. (2022, April). *ND EPSCoR STEM Award: Educating Middle School Students about Clinical Trials and Randomized Control Experiments*. Poster presented at the

annual conference of the North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR), Grand Forks, ND.

\*^Baird, J., Boese-Noreen, S., & **Summers, R.** (2022, April). *Developing and Refining Tasks for ND-ACES Bioscience Modules*. Poster presented at the annual conference of the North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR), Grand Forks, ND.

\*+Algarni, S., **Summers, R.**, Beaty, A., & Belfiori, M. (2021, April). *Map of topics and concepts addressed in ND ACES bioscience module 1: Cellular scaffolding*. Poster presented at the annual conference of the North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR), Fargo, ND. [Online presentation.]

**Summers, R.**, & Navarro, R. (2020). *Exploring students' intentions to engage with science: A side-by-side comparison of two theoretical models*. Paper accepted for presentation at the annual conference of the North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR), Grand Forks, ND. [Presentation scheduled 21 April 2020 canceled due to COVID-19]

**Summers, R.** (2020). *Making Science Practices Explicit and Encouraging Student Reflection through Formative Assessment*. Presentation accepted for the annual conference of the North Dakota Science Teachers Association, West Fargo, ND. [Presentation scheduled 13 March 2020 canceled due to COVID-19]

#### INVITED SESSIONS: SEMINARS AND LECTURES

Amador, J., Sansom, R., & **Summers, R.** (2024, February). Rural partnerships (Part 2): Building partnerships and proposal preparation. Consultation session organized by Ilana Horn, Vanderbilt University, Community for Advancing Discovery Research in Education (CADRE) Learning Series. [Online]

Amador, J., Sansom, R., & **Summers, R.** (2024, January). Rural partnerships (Part 1): Creating mutually beneficial partnerships. Invited panel discussion moderated by Ilana Horn, Vanderbilt University, Community for Advancing Discovery Research in Education (CADRE) Learning Series. [Online]

**Summers, R.**, Levenson, K., Jonas, D., & Karmen, R. (2023, December). STEM education in North Dakota. Invited panel discussion hosted by Justin Walden, moderated by Ricot Aladin. North Dakota EPSCoR, North Dakota State University, Fargo, ND.

**Summers, R.** (2021, December). Translating research into practice: Exploring the inclusion of science education research in practitioner-focused journals. Invited lecture, delivered online, Jeanne Brunner's Survey of Mathematics and Science Education Research (EDUC 738), University of Massachusetts, Amherst. [Online]

Herbert, M., Van Eck, R., **Summers, R.**, Tomkinson, G., & Anderson, R. (2021, November). Team Science in CEHD: Should I Start a Research Group? Invited panel discussion moderated by Robert Stupnisky, Research and Faculty Development Committee, College of Education and Human Development, University of North Dakota, Grand Forks, ND.

Stupnisky, R., & **Summers, R.** (2018, April). Submitting your first external research grant application. Invited lecture, Scholarship and Teaching Enhancement Presentation Series (STEPS), University of North Dakota, Grand Forks, ND.

## IN THE NEWS

Criswell, W. (2024, August 20). *New technologies take spotlight at Pages & Pathways conference [contributions by R. Summers]*. UND Today. Retrieved from <[https://blogs.und.edu/und-today/2024/08/new-technologies-take-spotlight-at-pages-pathways-conference/?utm\\_source=mailpoet&utm\\_medium=email&utm\\_source\\_platform=mailpoet&utm\\_campaign=Aug.%202024%20issue](https://blogs.und.edu/und-today/2024/08/new-technologies-take-spotlight-at-pages-pathways-conference/?utm_source=mailpoet&utm_medium=email&utm_source_platform=mailpoet&utm_campaign=Aug.%202024%20issue)>

Community for Advancing Discovery Research in Education (CADRE). (2024, July 29). *Assessing teaching practice [contributions by R. Summers]*. Retrieved from <<https://cadrek12.org/spotlight/assessing-teaching-practice#resources>>

WestEd. (2024, May 29). Spotlight on Rural Education: Addressing the Challenges to Support Student Success [**highlights NSF-funded research, PI Summers**]. Retrieved from <<https://www.wested.org/wested-bulletin/insights-impact/spotlight-on-rural-education-addressing-the-challenges-to-support-student-success/>>

WestEd. (2024, April 17). Demystifying Science and Engineering Education in Rural Classrooms: Q&A With Dr. Ashley Iveland and Jill Grace [**highlights NSF-funded research, PI Summers**]. Retrieved from <<https://www.wested.org/wested-bulletin/insights-impact/demystifying-science-and-engineering-rural-classrooms/>>

WestEd. (2023, October). *Rural education spotlight: STEM STRONG [contributions by R. Summers]*. NGSS Now Newsletter. Retrieved from <<https://ngs.wested.org/ngss-now/>>

<sup>+</sup>Vonasek, J. (2023, November 30). *From banana splits (flash frozen) to splitting atoms [Contributions by R. Summers, & T. Twedell]*. UND Today. Retrieved from <[https://blogs.und.edu/und-today/2023/11/from-banana-splits-flash-frozen-to-splitting-atoms/?utm\\_source=mailpoet&utm\\_medium=email&utm\\_campaign=Nov.+30%2C+2023+issue](https://blogs.und.edu/und-today/2023/11/from-banana-splits-flash-frozen-to-splitting-atoms/?utm_source=mailpoet&utm_medium=email&utm_campaign=Nov.+30%2C+2023+issue)>

Criswell, W. (2023, August 15). *Teachers teaching teachers about STEM teaching [Contributions by R. Summers]*. UND Today. Retrieved from

<<https://blogs.und.edu/und-today/2023/08/teachers-teaching-teachers-about-stem-education/>>

Community for Advancing Discovery Research in Education (CADRE). (2023, April). *Rural STEM education* [Research highlight prepared by **R. Summers**]. Retrieved from <<https://cadrek12.org/spotlight/rural-stem-education>>

\*+Murphy, C. (2020, November 11). *Students in 'methods and materials' class earn field experience through virtual collaborations, tutoring* [Contributions by **R. Summers**, L. Dickerman, & M. Johnson]. Retrieved from <<http://blogs.und.edu/und-today/2020/11/how-unds-teachers-in-training-navigate-covid-19/>>

## RESEARCH GRANTS

### Awarded

National Science Foundation, Discovery Research, Late stage design and development K-12. *Investigating how combining intensive professional development and modest support affects rural, elementary teachers? science and engineering practice*. \$2,955,381. **R. Summers (Principal Investigator)**, R. Hammack, A. Iveland, M. Inouye, C. Ringstaff (co-Principal Investigators), J. Robinson. August 2022 – July 2026.

National Institute of Health, National Institute of Neurological Disorders and Stroke (R25 NS110050). \$530,075. *Indians into Medicine: Native Educator University Research Opportunity in Neuroscience*. H. Brown-Borg (Managing Principal Investigator), formerly S. Sletten, **R. Summers (co-PI)**. June 2021 – May 2026.

National Science Foundation. CAREER: Molecular Recognition of 8-oxoguanine Modified G-Quadruplexes by the FANCD1 Helicase and the REV1 Polymerase. C. Wu (Principal Investigator), & **R. Summers (Science Education Consultant)**. January 2022 – December 2026.

U.S. Department of Education. 21<sup>st</sup> Century Community Learning Centers. *Beyond the Bell*. N. M. Lowey, T. Bell (Illinois School District #204) ... **R. Summers, Science Education Research and Evaluation**. July 2020 – Present. [\$30,000]

National Science Foundation, North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR) STEM Education, Research, and Outreach SEED Award. *Engaging Pre-college Students in Working with Authentic Biomedical Data to Develop Understandings of Experimental Design and Clinical Research*. **R. Summers, Principal Investigator**, T. Walch, A. Kelliher, J. Robinson, M. Basson, D. Warne, & R. Navarro. October 2021 – Present. [\$15,000]

National Science Foundation. Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES). Planning: *Cultivating Indigenous Research Communities for Leadership in Education and STEM (CIRCLES)*. A. Thomas Overall Principal Investigator (Montana), K.A. Rusch, Principal Investigator, J. Ostrom-Blonigen, Co-Principal Investigator, ... **R. Summers, co-PI, STEM Education Faculty**. September 2020 – September 2022. [\$50,000]

Education, Outreach & Workforce Development, National Science Foundation, North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR) Track-1 Award. *New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES)*. C. Fitzgerald, Principal Investigator (formerly K.A. Rusch), J. Mihelich, Co-Principal Investigator, ... **R. Summers, Education and Workforce Development**. July 2020 – Present. [\$5,963,361]

Education, Outreach & Workforce Development (Rural STEM Education), National Science Foundation, North Dakota Experimental Program to Stimulate Competitive Research (ND-EPSCoR) Track-1 Award. *Innovative and Strategic Program Initiatives for Research and Education-North Dakota (INSPIRE-North Dakota)*. Research Grant. K.A. Rusch, Project Director and Principal Investigator (NDSU), M. Hoffmann, Co-Principal Investigator (UND), J. Ostrom-Blonigen, Co-Principal Investigator (NDSU), ... **R. Summers, Education and Workforce Development**. August 2016 – Present. [\$224,995]

National Science Foundation. EAGER: Observations of Falling Snow in Windy Environments. A. Kennedy (Principal Investigator), & **R. Summers (Science Education Consultant)**. August 2018 – July 2020. [\$166,563]

North Dakota IDeA Network of Biomedical Research Excellence (NDINBRE). Health and the Environment. D. Sens (Principal Investigator), V. Doze, S. Sletten, & **R. Summers (Science Education Consultant)**. Sponsored by the National Institutes of Health. August 2014 – April 2019. [\$16,892,803]

## **CAPACITY BUILDING GRANTS**

North Dakota University System. Strategic Investment, UND Center for Engineering Education Research (CEER). Awarded to the Colleges of Engineering and Mines and Education and Human Development. Prepared by R. Navarro, **R. Summers**, & J. Robinson. July 2023 – June 2027. [\$300,570]

North Dakota University System, UND Office of the Provost. Strategic Investment, Engineering Education Post-Doctoral Seed Funding Program. Awarded to the Colleges of

Engineering and Mines and Education and Human Development. Prepared by R. Navarro, **R. Summers**, & J. Robinson. July 2020 – June 2022. [\$140,000]

## **EDUCATION AND TRAINING GRANTS**

Rural Schools Collaborative. UND Catalyst Grant, A Strengths-Approach to Rural Collaborations: Identifying and collaborating in the recruitment and retention of teachers in diverse rural settings. C. Hunter, B. Gourneau (Corresponding Investigator), D. D'Amico-Pawlewicz, J. Robinson, & **R. Summers**. [\$25,000]

North Dakota Career and Technical Education Department. *Future City in North Dakota*. T. Young, Principal Investigator, M. Gilmore, Y. Ji, & **R. Summers, Co-Principal Investigators**. August 2019 – July 2021. [\$50,000]

STEAM Energy!, North Dakota Department of Public Instruction. ND-DPI, Mathematics and Science Partnership Grant Program. T. Young Principal Investigator, M. Gilmore & **R. Summers**, Co-Principal Investigators. September 2017 – October 2018 [\$50,000]

STEAM Energy!, North Dakota Department of Public Instruction. ND-DPI, Mathematics and Science Partnership Grant Program. T. Young Principal Investigator, S. Ralph & **R. Summers, Co-Principal Investigators**. September 2015 – October 2017. [\$323,674]

## **RESEARCH AWARDS**

Rose Isabella Kelly Fischer Professorship Award, 2022 – 2024  
College of Education and Human Development, University of North Dakota. [\$30,000]

Early Career Award for Excellence in Research (ASPIRE Award) 2023  
College of Education and Human Development, University of North Dakota. [\$500]

Excellence in Research and Scholarship, 2021  
College of Education and Human Development, University of North Dakota. [\$500]

Research Mini-Grant, College of Education and Human Development, 2020  
University of North Dakota. [\$3000]

New Faculty Scholar Award, Senate Scholarly Activities Committee, 2017  
University of North Dakota. [\$2,700]

Dissertation Completion Fellowship, Graduate College, 2015  
University of Illinois at Urbana-Champaign. [\$20,000]

Hardie Dissertation Award, College of Education, 2015

University of Illinois at Urbana-Champaign. [\$2000]

Robert Ferber Dissertation Award for Excellence in Survey Research, 2014  
Survey Research Lab, University of Illinois at Urbana-Champaign. [\$2000]

### **PROFESSIONAL AWARDS**

UND Faculty Scholar Award for Excellence in Teaching, Research, and Service, 2022  
*Nominee*

TLPP Department Service Award, University of North Dakota. 2021

### **TRAVEL AWARDS**

Conference Travel Award, College of Education and Human Development, 2017, 2018  
University of North Dakota

Conference Travel Award, Graduate College, 2015  
University of Illinois at Urbana-Champaign.

Hardie Conference Travel Award, College of Education, 2013, 2015  
University of Illinois at Urbana-Champaign.

### **PROFESSIONAL DEVELOPMENT**

*Attendee,* 2023  
Understanding Generative AI's Impact on the Information Landscape (2023, September 8).  
Hosted by Teaching Transformation and Development Academy (TTADA), University of  
North Dakota, Grand Forks, ND.

*Attendee,* 2023  
Pitch Like a Pro (2023, June 29). Hosted online by The Conversation U.S, University of  
North Dakota, Grand Forks, ND.

*Attendee,* 2021  
Facilitating Entering Mentoring Workshop. Presented by A. B. O'Connell, K. J. Martinez-  
Hernandez, & M. McDaniels. Hosted online by the Center for the Improvement of Mentored  
Experiences in Research, University of Wisconsin, Madison, WI.

*Attendee,* 2020  
PERSIST National Science Foundation (NSF) NOYCE Track 4 Informational Workshop.  
(2020, January 8). Presented by G. Roehrig, J. Wieselmann, H. Sevian, K. Caushi, W. M.

Smith, & R. Funk. Hosted by the Association for Science Teacher Education (ASTE), San Antonio, TX.

*Attendee,* 2019  
Holding Space: A Toolkit for Partners in Tribal Research. (2019, April 13). Presented by Y. Roubideaux, J. E. Lucero, G. Evans-Lomayesva, & A. D. Emerson. Hosted by the School of Medicine and Health Science, University of North Dakota, Grand Forks, ND.

*Attendee,* 2019  
Hanover Research Grant Writing Workshop. (2019, February 21). Presented by C. Doggett. Hosted by the College of Education and Human Development and College of Nursing and Professional Disciplines, University of North Dakota, Grand Forks, ND.

*Attendee,* 2018  
Systematic Literature Reviews. (2018, April 20). Presented by V. Clinton, Scholarship and Teaching Enhancement Presentation Series (STEPS). Hosted by the College of Education and Human Development, University of North Dakota, Grand Forks, ND.

*Attendee,* 2018  
Embedding High Impact Practices (HIPs) Strategically. (2018, February 26). Presented by A. Kelsch. Hosted by the Teaching Transformation and Development Academy, University of North Dakota, Grand Forks, ND.

*Attendee,* 2018  
Recording Lectures with Tegrity. (2018, February 22). Presented by T. Storkson. Hosted by the Teaching Transformation and Development Academy, University of North Dakota, Grand Forks, ND.

*Attendee,* 2018  
Conflict Resolution Training. (2018, February 16). Hosted by the College of Education and Human Development, University of North Dakota, Grand Forks, ND.

*Attendee,* 2017  
Live Text VIA Training. (2017, May 15). Presented by T. Salwey. Hosted by Teacher Education, University of North Dakota, Grand Forks, ND.

*Attendee,* 2017  
Being a grant reviewer. (2017, April 19). Presented by R. Navarro. Hosted by the College of Education and Human Development, University of North Dakota, Grand Forks, ND.

*Attendee,* 2017  
Safe spaces and difficult conversations. (2016, October 7). Presented by S. Mitchell. Hosted by the College of Education and Human Development, University of North Dakota, Grand Forks, ND.

*Participant,* 2017, 2018, 2019  
Assessment Retreat for Undergraduate Initial Licensure Programs. Hosted Teacher Education, University of North Dakota, Grand Forks, ND.

## **PROGRAM DEVELOPMENT**

M.S. Teaching & Leadership Dual Credit Tracks 2023  
Facilitated conversations between Education and Human Development and Arts and Sciences with Dr. Laura Link leading to the creation of online graduate courses designed to prepare educators to teach content courses for college credit.

M.S. Teaching & Leadership STEM Education 2021  
Developed three new courses to launch STEM Education track with Dr. Julie Robinson.

Teaching & Leadership Graduate Certificate 2021  
Developed Graduate Certificate Program, Computer Science Education for Teachers.

STEAM Energy 2019  
Developed Continuing Education Module for Middle Level Science Teachers.  
C&I (Track 2) Master of Science Fall 2017 – Spring 2018  
Developed online course, TL 5XX Specialized Methods: Science.

B.S.Ed. Composite Science Spring 2017  
Revised course requirements for the undergraduate program area.