

Colby Tofel-Grehl
2805 Old Main Hill Logan, UT 84322
(435) 797-1342
Email: colby.tg@usu.edu

Academic and Professional Appointments

Utah State University

School of Teacher Education and Leadership

Associate Professor, Science Education	2020-present
Assistant Professor, Science Education	2013-2020
Coordinator of Science Education Graduate Programs	2020-present
Coordinator of the Science Education Ph.D. Concentration	2017-present
Coordinator of Secondary Science Teacher Education	2013-present
Coordinator of Mathematics, Engineering, & Science Achievement (MESA)	2018-2019

University of Virginia

Department of Curriculum and Instruction

Curry School of Education, University of Virginia

Graduate Research Assistant	2009-2013
Graduate Teaching Assistant, Elementary Education	2009-2013
University Student Teacher Supervisor	2009-2012

PS#1 Elementary School, Santa Monica, CA

Fourth/Fifth grade classroom teacher (9/02-6/05; 2008): Responsible for development, implementation, and assessment of all aspects of classroom curriculum for split age classroom. Additionally, I chaired Math & Science committees.

The Country School, North Hollywood, CA

Kindergarten grade classroom teacher (9/00-6/02): Responsible for development, implementation, and assessment of all aspects of classroom curriculum for split age classroom. Served as a member of the Seeking Equity through Education and Diversity (SEED) committee.

Crossroads High School Santa Monica, CA

High School Oceanography Teacher (6/00-8/00)

Responsible for developing and teaching oceanography to high school students across the spectrum from gifted to special needs.

Education

Ph.D., Curriculum and Instruction

2013

Concentration in Science Education

University of Virginia, Curry School of Education, Charlottesville, VA

Exploring Specialized STEM High Schools: Three Dissertation Studies Examining Commonalities and Differences across Six Case Studies

Committee: Carolyn Callahan (Chair), Joe Garofalo, Robert Q. Berry III, and Daniel Berch

B.A., Anthropology, Archaeology, and Primatology

1999

Thesis Paper: Paleo Ethno-Botany of the Wadi Qumran

Fordham University, New York, NY

Awards and Recognitions

2021 National Science Foundation Innovative Use of Technology and Learning Experiences in the Service of Broadening Participation Exemplar Project for *Project ESTITCH*. 3 awardees are selected annually by NSF ITEST program officers for each of the ITEST program pillars.

2021-2022 Emma Eccles Jones College of Education and Human Services' Center for the Schools of the Future Faculty Research Fellow. This research fellowship is awarded annually to a faculty member with an outstanding research agenda for promoting and supporting the mission of the Center for the Schools of the Future in teacher education.

Finalist for 2021 John C. Park National Technology Leadership Initiative (NTLI) Fellowship Award, Association for Science Teacher Education (2021). Nominated for paper *Making Space: Exploring the affordances of making for LGBTQ+ rural youth*.

Finalist for 2021 John C. Park National Technology Leadership Initiative (NTLI) Fellowship Award, Association for Science Teacher Education (2021). Nominated for paper *Exploring Shifts and Interactions Between Teacher and Student Attitudes During Maker Projects in Science*

School of Teacher Education and Leadership, Utah State University, Undergraduate Research Mentor of the Year (2020)

Association for Science Teacher Education Teacher Educator of the Year, Level 1 (2020). This award is given annually to the person who most significantly impacted science teacher education.

National Science Foundation Early Career Research Grant Award (2020) *Job Embedded Education for CT for Rural STEM Teachers*

Award for Significant Contribution to Educational Measurement and Research Methodology, Division D, American Educational Research Association (2019). Awarded for research methods paper "Phenomenography as a Foundation for Mixed Models Research" in *American Behavioral Scientist*, 62(7), 887-899.

Teacher of the Year, USU School of Teacher Education and Leadership (2018). Awarded for excellence and innovation in teaching for the 2017-2018 academic year. Awardees are automatically nominated for the College of Education Teacher of the Year Award.

Nominee, Utah Governor's Science and Technology Medal (2018). The Utah Governor's Medal for Science and Technology is the highest civilian award bestowed by the State in the fields of academia, science education, industry, and government.

Invited Panelist for National Association for Research in Science Teaching Early Career Faculty Forum (2017). Eight scholars from around the nation were selected to speak with junior faculty about their research agendas and how to successfully navigate academia as junior faculty.

SIGCSE NSF Selected Showcase Principal Investigator (2017). The National Science Foundation nominates 20 principal investigators annually to have their work showcased at the SIGCSE.

Researcher of the Year, USU School of Teacher Education & Leadership (2015). This award is given at the departmental level to recognize outstanding efforts in research and scholarship for faculty within TEAL. Awardees are automatically nominated for the College of Education Researcher of the Year Award.

Curry Cup Winner (2011). This award is given to the peer reviewed engineering design and business model project winner of the year from across University of Virginia.

Barbara Labrecque Corbin Scholarship Award (2010). This award is given to the outstanding science education Ph.D. candidate at University of Virginia who seeks to pursue a career in academe in science education & teacher training.

Editorial Review Boards and Editing Duties

Guest Editor for *The Science Teacher*: Special Issue “Infectious Disease Education”

Invited Guest Editor for *Education Sciences*: Special Issue “STEM Curricula in Early Childhood Education”
https://www.mdpi.com/journal/education/special_issues/STEM_in_Early - December 2020 to present

Editorial Review Board Member for *Contemporary Issues in Technology and Teacher Education*. (2021-present).

Editorial Review Board Member for *Journal of Science Teacher Education* (2019-present).

Editorial Review Board Member for *International Journal of Multiple Research Approaches* (2018-present).

Editorial Review Board for *Preparing Teachers to Teach Computer Science: Models, Practices and Policies* (2019- present). Editorial board for edited volume by C. Mouza, A. Yadav, and A. Leftwich.

Editorial Review Board Member for *Innovations in Science Teacher Education* (2016-present).

Funded Grants (Total funding: \$19,822,751)

(PI total: \$19,108,007, Co PI total: \$583,744, Senior Personnel total: \$199,000)

Noyce Capacity Building of Master STEM Teachers in Rural Spaces. (2020-2021; NSF 2050408).
Role: Principal Investigator. Budget: \$74,744 over 12 months. Submitted to the National Science Foundation. This project develops a statewide collaboration for STEM teacher development.

Collaborative Research: Indian Education in Computing: a Montana Story (2020-2024; NSF 2031279). *Role: Co-Principal Investigator.* Budget: \$364,744 over 36 months. Funded by the National Science Foundation. This grant explores the affordances of Maker technologies and computing for American Indian education.

RAPID: Virtual Epidemics for Promoting Upper Elementary and Middle School Students’ Immersion and Inquiry into Pandemic Outbreaks. (2020-2021; NSF 2031748). *Role: Senior Personnel.* Budget: \$199,000 over 12 months. Funded by the National Science Foundation. This project explores the development of a classroom curriculum and teacher professional learning to support learning around epidemics.

CAREER: Job Embedded Education for CT for Rural STEM Teachers. (2020-2025; NSF 2050408). *Role: Principal Investigator.* Budget: \$869,773 over 60 months. Funded by the National Science Foundation CAREER grant solicitation. This project explores rural PD approaches to computer science education.

Project E-STITCH: Elementary STEM Teaching Integrating Textiles and Computing Holistically Research Experiences for Undergraduates (2019-2021; NSF 1758823). *Role: Principal Investigator.* Budget: \$10,250 over 12 months. Funded by the National Science Foundation ITEST program, 2019-2020. This project explores the affordances of Maker technologies for social studies education.

Project E-STITCH: Elementary STEM Teaching Integrating Textiles and Computing Holistically

Supplement (2019-2022; NSF 1758823). *Role: Principal Investigator.* Budget: \$31,439. Funded by the National Science Foundation ITEST program, 2019-2020. This project explores the affordances of Maker technologies and computing for social studies education.

Project E-STITCH: Elementary STEM Teaching Integrating Textiles and Computing Holistically (2018-2022; NSF 1758823). *Role: Principal Investigator.* Budget: \$399,531 over 24 months. Funded by the National Science Foundation ITEST program, 2018-2020. This project explores the affordances of Maker technologies and computing for social studies education.

GEAR UP: USU STARS: Gaining Early Awareness and Readiness for Undergraduate Programs: Utah State University Science Technology Arithmetic Reading Students. (2017-2024; US-DOE Award Number: P334A170049). *Role: Principal Investigator.* Budget: \$16,500,000 over 84 months. Funded by the United States Department of Education GEAR UP program.

Project STITCH Supplement: STEM Teaching Integrating Textiles and Computing Holistically. (2015-2019; NSF 1745409). *Role: Principal Investigator.* Budget: \$52,873 over one year. Funded by the National Science Foundation STEM-C Program, 2017-2019. This project develops scaffolded professional learning for secondary science teachers around Making and computing.

Project STITCH: STEM Teaching Integrating Textiles and Computing Holistically. (2015-2019; NSF 1542801). *Role: Principal Investigator.* Budget: \$1,091,397. Funded by the National Science Foundation STEM-C Program.

Animal Investigators: Constructing Tools for Data-Driven Science. (2016-2017). *Role: Co-Principal Investigator.* Budget: \$20,000 over one year. Funded by Utah State University.

Elementary STEM Endorsement Professional Development. (2015-2017). *Role: Co-Principal Investigator.* Budget: \$199,000 for two years. Funded by Utah State Office of Education.

Expanding E-textiles in Wyoming CTE Classrooms. (2015-2016). *Role: Principal Investigator.* Budget: \$7,500. Funded by the Williams Corporation.

Retooling E-Textiles to Teach Utah Science Standards. (2014-2015). *Role: Principal Investigator.* Budget: \$2,500. Funded by the Williams Corporation.

Grants Under Review (pending total: \$6,397,918)

Collaborative Research: DTI: Connected threads across communities: Intergenerational Storytelling through E-textiles and XR (Co-PI: Tofel-Grehl). Budget: \$402,602. Submitted to the National Science Foundation ITEST Program.

The Migration Data Project (PI: Tofel-Grehl). Budget: \$1,495,000. Submitted to the National Science Foundation ITEST Program.

Utah STEM Master Educator Innovation Center. (PI: Tofel-Grehl). Budget: \$2,999,983. Submitted to the National Science Foundation NOYCE program.

COLLABORATIVE RESEARCH: Participatory Virtual Epidemics: Investigating Middle School Students' STEM Interests and Inquiry into Infectious Outbreaks. (Co-PI: Tofel-Grehl). Budget: 1,350,499. Submitted to the National Science Foundation

Making Space: An Art and STEM Research Collaborative. (Co-PI: Tofel-Grehl). Budget: \$149,987 over 24 months. Submitted to the National Endowment for the Arts.

Peer Reviewed Journal Articles (*denotes student co-author)
(average citation rate for research articles= 25)

35. Tofel-Grehl, C., Jeong, S., *Hansen, T., *Bennett, B., & Searle, K. (Under Review). Making it Worthwhile: A quasi-experimental study exploring the value of Maker technology in classrooms. *Journal of Science Education and Technology*.

34. Searle, K.A., **Tofel-Grehl, C.,** Fischback, L., & Hansen, T. (under review). Affordances and Limitations of Teachers Instructional Styles When Teaching Computer Science and Computational Thinking. *Computer Science Education*.

33. Hawkman, A. M., **Tofel-Grehl, C.,** Searle, K., & MacDonald, B. L. (under review). Successes, challenges, and surprises: Teacher reflections on using children's literature to explore complex social issues in the elementary classroom. *Teachers and Teaching*.

32. Tofel-Grehl, C., Searle, K., Ball, D., & Jeong, S. (under review) Exploring Science, Computing, and Project Engagement (ESCAPE): Understanding science student engagement with computer science and computational thinking for project-based learning. *International Journal of Computer Supported Collaborative Learning*.

31. Tofel-Grehl, C., *Bennett, B., Lott, K. *Hansen, T., *Ball, D., Longhurst, M., & *Balls, M. (Under Review) Misconceptions and Instruction: An Examination of How Elementary Science Teachers' Scientific Misconceptions Move from Private Understandings to Instructional Barriers. *School Science and Mathematics*.

30. Tofel-Grehl, C., *Olsen, E., *Ball, Doug., & Searle, K. (Under Review). Engaging faded scaffolds for preservice science teachers to facilitate technology adoption. *Innovations in Science Teacher Education*.

29. **Tofel-Grehl, C.,** Hawkman, A.M., Suarez, M., MacDonald, B., Searle, K., & Feldon, D. (Revise and Resubmit). "I can be the weird STEM kid who is also gay": Queer rightful presence in STEM making. *Journal of the Learning Sciences*.

28. **Tofel-Grehl, C.,** Searle, K., & Ball, D. (Revise and Resubmit). Integrating scientific reasoning practices with computational thinking practices for deeper learning in high school physics. *Journal of Science Education and Technology*.

27. Searle, K.A., **Tofel-Grehl, C.,** Hawkman, A., Suarez, M., & MacDonald, B. (Revise and Resubmit). Facing white fragility: Case study of an elementary teacher. *Cultural Studies of Science Education*.

26. Suárez, M. I., Hawkman, A. M., **Tofel-Grehl, C.,** MacDonald, B. L., Searle, K., Feldon, D. F., Sommers, T., & Hernandez, M. (Revise and Resubmit). STEM as a cover: Towards a framework for queer emotions, battle fatigue, and STEM identity. *International Journal of Qualitative Studies in Education*.

25. **Tofel-Grehl, C.,** Searle, K., Hawkman, A.M., MacDonald, B., & Suarez, M. (Accepted). Rural teachers' cultural and epistemic shifts in STEM teaching and learning. Submitted to *Theory and Practice in Rural Education*.

24. **Tofel-Grehl, C.,** Searle, K., Hawkman, A., *Hansen, T., & Lott, K. (2021). Crafting Circuits: Integrating Culturally Responsive Teaching and Current Events into Science. *Science and Children*. 58(4), 81-86.

23. Searle, K., **Tofel-Grehl, C.**, & MacDonald, B. (2021). Lighting up history: Integrating mathematics and computational thinking in the science classroom. *Science Scope*, 44(5).
22. **Tofel-Grehl, C.**, *Ball, D., & Searle, K. (2021). Coding as a novel metaphor for electric potential through making. *Journal of Educational Research*.
21. **Tofel-Grehl, C.**, *Jex, E., Searle, K., *Ball, D. & Zhao, X. (2020). Electrifying: One teacher's discursive and instructional changes through engagement in making to teach science content. *Contemporary Issues in Technology and Teacher Education*.
20. *Ball, D., & **Tofel-Grehl, C.** (2020). Potentially Electric: An E-Textiles Project as a Model for Teaching Electric Potential. *The Physics Teacher*, 58(1), 48-51. (cited 1 times as of 2.01.2021)
19. Searle, K., **Tofel-Grehl, C.**, & *Breitenstein, J. (2019). Equitable engagement in STEM: Using e-textiles to challenge the positioning of non-dominant girls in school science. *International Journal of Multicultural Education*, 21(1), 42-61. (cited 5 times as of 2.01.2021)
18. *Olsen, E., **Tofel-Grehl, C.**, & *Ball, D. (2018). The temperature-sensing lunchbox. *Science Scope*, 42(1), 47-52. (cited 3 times as of 2.01.2021)
17. Feldon, D. F., & **Tofel-Grehl, C.** (2018). Phenomenography as a foundation for mixed models research. *American Behavioral Scientist*, 62(7), 887-899. (cited 26 times as of 2.01.2021)
16. **Tofel-Grehl, C.**, Feldon, D. F., & Callahan, C. M. (2018). Impacts of learning standards and testing on gifted learners in STEM schools: A multilevel analytic induction. *Roeper Review*, 40(2), 130-138. (cited 9 times as of 2.01.2021)
15. **Tofel-Grehl, C.**, & Searle, K. (2017). Critical reflections on teacher conceptions of race as related to the effectiveness of science learning. *Journal of Multicultural Affairs*, 2(1), ar4. (cited 6 times as of 2.01.2021)
14. **Tofel-Grehl, C.**, Fields, D., Searle, K., Maahs-Fladung, C., Feldon, D., *Gu, G., & *Sun, C. (2017). Electrifying engagement in middle school science class: Improving student interest through e-textiles. *Journal of Science Education and Technology*, 26(4), 406-417. (cited 48 times as of 2.01.2021)
13. **Tofel-Grehl, C.**, Callahan, C. M., & Nadelson, L. S. (2017). Comparative analyses of discourse in specialized STEM school classes. *The Journal of Educational Research*, 110(3), 294-307. (cited 6 times as of 2.01.2021)
12. **Tofel-Grehl, C.**, & Callahan, C. M. (2017). STEM high school teachers' beliefs regarding STEM student giftedness. *Gifted Child Quarterly*, 61(1), 40-51. (cited 16 times as of 2.01.2021)\
11. Feldon, D. F., Peugh, J., Maher, M. A., Roksa, J., & **Tofel-Grehl, C.** (2017). Time-to-credit gender inequities of first-year Ph.D. students in the biological sciences. *CBE-Life Sciences Education*, 16(1), ar4. (cited 46 times as of 2.01.2021)
10. **Tofel-Grehl, C.**, Litts, B., & Searle, K. (2016). Getting crafty with the NGSS. *Science and Children*, 54(4), 48-53. (cited 4 times as of 2.01.2021)
9. **Tofel-Grehl, C.**, & Feldon, D. (2016). Reviewing STEM education for high ability learners. *Teachers' College Record*, ID 21604.
8. **Tofel-Grehl, C.**, & Callahan, C. M. (2016). STEM school discourse patterns. *Journal of STEM*

Education: Innovations and Research, 17(2), 34-41. (cited 8 times as of 2.01.2021)

7. **Tofel-Grehl, C.**, & Callahan, C. (2016). Variations in the intensity of specialized science, technology, engineering, and mathematics (STEM) high schools. *Journal of STEM Teacher Education*, 51(1), 33-56. (cited 3 times as of 2.01.2021)

6. **Tofel-Grehl, C.**, & Fields, D. (2015). Sewing up science. *The Science Teacher*, 82(8), 45-49. (cited 2 times as of 2.01.2021)

5. Forman, J., Gubbins, E. J., Villanueva, M., Massicotte, C., Callahan, C., & **Tofel-Grehl, C.** (2015). National survey of STEM high schools' curricular and instructional strategies and practices. *NCSSS Journal*, 20(1), 8-19. (cited 17 times as of 2.01.2021)

4. **Tofel-Grehl, C.** (2014). National Need for Parity in STEM Education. *Teaching Children Mathematics*, 21(5), 261-262.

3. **Tofel-Grehl, C.**, & Callahan, C. M. (2014). STEM high school communities: Common and differing features. *Journal of Advanced Academics*, 25(3), 237-271. (cited 41 times as of 2.01.2021)

2. **Tofel-Grehl, C.**, & Feldon, D. F. (2013). Cognitive task analysis-based training: A meta- analysis of studies. *Journal of Cognitive Engineering and Decision Making*, 7, 293-304. (cited 71 times as of 2.01.2021)

1. **Tofel-Grehl, C.** (2011). Reviewing a power shift in public education. *American School Board Journal*, 198, 46.

Invited Articles (*denotes student co-author)

1. *Jacob, S., Nguyen, H., **Tofel-Grehl, C.**, Richardson, D., & Warschauer, M. (2018). Teaching computational thinking to English learners. *NYS TESOL Journal*, 5(2), 12-24. (cited 16 times as of 2.01.2021)

Published Conference Proceedings (*denotes student co-author)

11. Strawhacker, A., Kafai, Y., T. Giang, M., Fields, D., & **Tofel-Grehl, C.** (2021). Designing the Virtual SPIKEY-20 Epidemic: Engaging Youth in Seeking Information and Using Personal Protection. In *Interaction Design and Children* (pp. 558-562).

10. Strawhacker, A., Hansen, T*, **Tofel-Grehl, C.**, & Kafai, Y. (2021). Teaching about COVID-19 : Using a Virtual Epidemic to Contextualize and Problematize Infectious Disease Epidemiology in a High School Class Submitted to *The Proceedings of 15th International Conference of the Learning Sciences (ICLS) 2021, Volume 1*.

9. Fischback, L., Searle, K., & **Tofel-Grehl, C.** (2021). Differentiated Instruction in Online Teacher Professional Development. Submitted to *The Proceedings of 15th International Conference of the Learning Sciences (ICLS) 2021, Volume 1*.

8. MacDonald, B., **Tofel-Grehl, C.**, Searle, K., & Hawkman, A. (2021). Putting the "M" back in STEM: Considering how units coordination relates to computational thinking. In XXX (Eds.). *Proceedings of the 42nd Annual Meeting of the North American Chapter of the International group for the Psychology of Mathematics Education (PME-NA)*. Maxatlan, Sinloa, Mexico.

7. *Cannell, C., **Tofel-Grehl, C.**, Searle, K., & Hawkman, A. (2020) Computational Migration: Using data visualization for understanding human movement. In *The Proceedings of 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1*. Nashville, TN.

6. Feldon, D., **Tofel-Grehl, C.**, & Searle, K. (2020) Measuring Contextual Shifts in Multidimensional Identity in Makerspaces. In *The Proceedings of 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1*. Nashville, TN.
5. *Ball, D., **Tofel-Grehl, C.**, & Searle, K. (2020) ESCAPE puzzles: Bringing physics to fruition through classroom-based making. In *The Proceedings of 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1*. Nashville, TN.
4. *Fischback, L. Searle, K., Shapiro, B. *Kelley, A., & **Tofel-Grehl, C.** (2020) Making changes: Counteracting Latina Young Women's Negative STEM Experiences through Culturally Responsive Physical Computing. In *The Proceedings of 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1*. Nashville, TN.
3. **Tofel-Grehl, C.**, Searle, K. & Feldon, D. (2018). Professional development for secondary science teachers: A faded scaffolding approach to preparing teachers to integrate computing. In J. Kay, & R. Luckin (Eds.), *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 1*. London, UK: International Society of the Learning Sciences.
2. *Ball, D., **Tofel-Grehl, C.**, & Searle, K. (2017). Sustaining Making in the era of accountability: STEM integration using e-textiles materials in a high school physics class. In *Proceedings of the 7th Annual Conference on Creativity and Fabrication in Education* (article 2). New York: Association for Computing Machinery (ACM).
1. Searle, K. A., **Tofel-Grehl, C.**, & Allan, V. (2016). The e-textiles bracelet hack: Bringing Making to middle school classrooms. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education* (pp. 107-110). New York: Association for Computing Machinery (ACM).

Manuscripts In Preparation (*denotes student co-author)

Tofel-Grehl, C., Peugh, J., & Jeong, S. (in preparation). A randomized control trial of e-textiles' impacts on learning and engagement in the secondary grades. *American Educational Research Journal*.

Tofel-Grehl, C., Searle, K., & Feldon, D. (in preparation). Merging cognition and constructionism: A unified theory of constructive cognitivism for scaffolding teacher cognitive load. *Cognition and Instruction*.

Tofel-Grehl, C., Strawhacker, A., Fields, D., Hansen, T., Giang, M., & Kafai, Y. Examining transfer from the virtual to real worlds: Exploring student action xxxx. *Journal of Science and Technology*.

Wei, Y., Kafai, Y., Fields, D., **Tofel-Grehl, C.** (in preparation). A Scoping Review of Tools and Environments for Teaching about Infectious Diseases in K-12 Education. *TBD*

Book Publications

4. **Tofel-Grehl, C.**, & Schanzer, E. (eds.) Data science for equity: Using data science to shift narratives and empower communities. *MIT Media Press*. (proposal under review)

3. **Tofel-Grehl, C.**, ESTITCH: Elementary STEM Teaching Integrating Technology Holistically. *Harvard Education Press*. (proposal in negotiation)

2. **Tofel-Grehl, C.** (2021). *Awesome Electronics Projects for Kids*. New York, NY. Calisto Media.

1. Gubbins, E. J., Villanueva, M., Gilson, C. M., Foreman, J. L., N. Bruce-Davis, M. N., Vahidi, S., Callahan, C., & **Tofel-Grehl, C.** (2013). *Status of STEM high schools and implications for practice*. Storrs, CT: University of Connecticut, The National Research Center on the Gifted and Talented.

Peer Reviewed Book Chapters (*denotes student co-author)

5. Feldon, D.F., & **Tofel-Grehl, C.**, (accepted). The application of phenomenography as a framework for the meaningful integration of mixed data types. In the *Routledge Handbook for Advancing Integration in Mixed Methods Research*. New York: Routledge.

4. **Tofel-Grehl, C.** (in press). Between a rock and a hard place: A reflective essay on anti-Semitism in the American academy. In Vol. 15, *Confronting Antisemitism on Campus Book Series: Equity in Higher Education Theory, Policy, & Praxis* Dr. Virginia Stead (General Editor), Peter Lang Publishing.

3. **Tofel-Grehl, C.** (2020). "Making" science meaningful and equitable. In Chahine, I.C., & de Beer, J. (Eds.) *Evidence-Based Inquiries in Ethno-STEM Research: Investigations in Knowledge Systems across Disciplines and Transcultural Settings*. Charlotte, NC: Information Age Publishing Inc.

2. **Tofel-Grehl, C.**, Callahan, C. M., & Hunsaker, S. (2017). Teacher beliefs regarding gifted and highly able learners in STEM schools in the United States. In K. S. Taber, M. Sumida, & L. McClure (Eds.), *Teaching gifted learners in STEM subjects: Developing talent in science, technology, engineering and mathematics* (pp. 31-45). New York: Routledge.

1. Howell, J., **Tofel-Grehl, C.**, Fields, D. A., & *Ducamp, G. J. (2016). E-textiles to teach electricity: An experiential, aesthetic, handcrafted approach to science. In C. Williams (Ed.), *Teacher pioneers: Visions from the edge of the map* (pp. 232-245). Pittsburgh, PA: ETC Press.

Conference Presentations (*denotes student coauthor)

International and National Presentations

77. Ball, D. & **Tofel-Grehl, C.** (2022) *Exploring the Relationship Between Discipline-Specific Subject Matter Knowledge and Discipline-Specific Science Teaching Efficacy of Elementary Teachers*. Paper presented at the International Meeting of the Association for Science Teacher Education.

76. Hansen, T. & **Tofel-Grehl, C.** (2022) *Science Discourse Patterns Compared with Pedagogical Content Knowledge During a Maker Project in an Elementary School Classroom*. Paper presented at the International Meeting of the Association for Science Teacher Education.

75. **Tofel-Grehl, C.** (2021). *Project ESTITCH: Elementary STEM Teaching Integrating Technology and Computing Holistically*. Poster presented at the National Science Foundation's Annual Principal Investigator Meeting for the ITEST Program. Alexandria, VA.

74. Kafai, Y., Xin, Y., Fields, D. & **Tofel-Grehl, C.** (submitted). *Texts, tools, games, and simulations for learning about infectious diseases: What do we know?* Paper presented as part of poster session entitled Infectious disease learning and teaching: Opportunities and challenges of integrating COVID-19 into K-16 education. Presented at the Annual Meeting of the American Education Research Association. San Diego, CA: April, 2022.

73. Strawhacker, A., Kafai, Y., Fields, D., & **Tofel-Grehl, C.** (submitted). *A vaccination drive for fighting a virtual virus in the online world of Whyville*. Paper presented as part of poster session entitled Infectious disease learning and teaching: Opportunities and challenges of integrating COVID-19 into K-16 education. Presented at the Annual Meeting of the American Education Research Association. San Diego, CA: April, 2022.

72. Sommers, T., Veon, R., Mather, J., **Tofel-Grehl, C.**, & Hernandez. M. (under review). *Inclusive, Art-based, STEAM Maker Spaces*. National Art Education Association Conference.

71. Kafai, Y., Fields, D., *Hansen, T., Strawhacker, A., Sun, J., & **Tofel-Grehl, C.** (2021). *Spikey-20: A virtual epidemic for learning about COVID-10*. Video showcase at the National Science Foundation STEM for All Video Showcase: COVID, Equity, & Social Justice for All.

70. Fischback, L., Searle, K.A., & **Tofel-Grehl, C.** (2021). *Differentiated instruction in online teacher professional development*. Poster presented at the International Conference of the Learning Sciences.

69. Strawhacker, A., *Hansen, T., **Tofel-Grehl, C.**, & Kafai, Y. (2021). *Teaching about COVID-19: Using a virtual epidemic to contextualize and problematize infectious disease epidemiology in a high school class*. Poster presented at the International Conference of the Learning Sciences.

68. Fischback, L., Searle, K.A., & **Tofel-Grehl, C.** (2021). *Affordances of online professional learning*. Paper presented at the European Science Education Research Association International Conference.

67. Feldon, D. F., & **Tofel-Grehl, C.** (2021). *Phenomenography as a foundation for mixed methods in measurement: Extensions*. Invited presenters for the Division D Awards session presented at the Annual Meeting of the American Educational Research Association. Virtual Conference: April 11, 2021.

66. Suárez, M. I., Hawkman, A. M., **Tofel-Grehl, C.**, MacDonald, B. L., & Searle, K. (2021). STEM as a cover: Towards a framework for queer emotions, battle fatigue, and STEM identity [Roundtable session]. Paper presented at the Annual Meeting American Educational Research Association. Virtual Conference: April 11, 2021

65. **Tofel-Grehl, C.**, *Hansen, T., Fields, D., Strawhacker, A., Kafai, Y., Sun, J., & Dinan, M. (2021). *Making connections: High school students writing in online newspaper about their experiences with virtual and real epidemics*. Presented as part of *the Infectious Designs: Youth and Family Learning about COVID-19 with Popular and Social Media* for the Connected Learning Summit

64. **Tofel-Grehl, C.**, Fields, D., Kafai, Y., Strawhacker, A., *Hansen, T., & Giang M. (2021). *Making connections to COVID: Students' sensemaking about prevention and behavior in a virtual epidemic*. Submitted to the European Science Education Research Association International Conference.

63. **Tofel-Grehl, C.**, Searle, K., Feldon, D., MacDonald, B., Hawkman, A., Suarez, M., Fischback, L., & Lundell, K*. (2021). *Making Space: Exploring the affordances of making for LGBTQ+ rural youth*. Paper presented virtually to the Association for Science Teacher Education Conference. Salt Lake City, UT.

62. Ball, D., **Tofel-Grehl, C.**, & Searle, K. (2021). *Exploring shifts and interactions between teacher and student attitudes during Maker projects in science*. Paper presented virtually to the Association for Science Teacher Education Conference. Salt Lake City, UT.

61. Searle, K.A., Litts, B.K., Hamilton, M.*, Garcia, P., Fasy, B.T., & **Tofel-Grehl, C.** (2020). *What do we mean when we say we're being culturally responsive?* Symposium at the 2020 AECT Convention. Orlando, FL.

60. Suárez, M. I., Hawkman, A. M., **Tofel-Grehl, C.**, MacDonald, B. L., & Searle, K. (2020). STEM as a cover: Towards a framework for queer emotions, battle fatigue, and STEM identity. Paper submitted to the 2021 American Educational Research Association Annual Conference, Orlando, FL.

59. *Sommers, T., Tofel-Grehl, C., & Veon, R. (2021). *Queer Maker-Spaces: Creating art-centered, technology-driven safe spaces for queer youth and allies*. Paper submitted to the 2021 National Art Ed Conference. Chicago, IL.

58. Hawkman, A. M., **Tofel-Grehl, C.**, Suárez, M. I., MacDonald, B., & Searle, K. (2020). *Reflections on Preparing Teachers to Engage Elementary Students in Discussion of Complex Social Issues*. Paper submitted to the 2020 American Educational Studies Association Annual Conference, San Antonio.
57. Suárez, M. I., Hawkman, A. M., MacDonald, B., Searle, K., & **Tofel-Grehl, C.** (under review). *Violence manifested through an informal STEM camp for queer youth in rural America*. Paper submitted to the 2020 American Educational Studies Association Annual Conference, San Antonio, TX.
56. Cannell, C., **Tofel-Grehl, C.**, Searle, K., & Hawkman, A. (2020) *Computational migration*. Presented at the Annual International Conference of the Learning Sciences. Nashville, TN. June 19-23. (conference canceled due to COVID).
55. *Ball, D., **Tofel-Grehl, C.**, & Searle, K. (2020) *ESCAPE puzzles: Bringing physics to fruition through classroom-based making*. Presented at the Annual International Conference of the Learning Sciences. Nashville, TN. June 19-23. (conference canceled due to COVID).
54. *Fischback, L. Searle, K., Shapiro, B. *Kelley, A., & **Tofel-Grehl, C.** (2020) *Making changes: Counteracting Latina Young Women's Negative STEM Experiences through Culturally Responsive Physical Computing*. Presented at the Annual International Conference of the Learning Sciences. Nashville, TN. June 19-23. (conference canceled due to COVID).
53. Feldon, D., **Tofel-Grehl, C.**, & Searle, K. (2020) *Measuring Contextual Shifts in Multidimensional Identity in Makerspaces*. Presented at the Annual International Conference of the Learning Sciences. Nashville, TN. June 19-23. (conference canceled due to COVID).
52. Searle, K., **Tofel-Grehl, C.**, & Hawkman, A., (2020) *Authenticity in integrated elementary school e-textiles learning*. Presented as part of a symposium at the Collaborative Learning Summit. Cambridge, MA: July 29-31, 2020. (conference canceled due to COVID).
51. **Tofel-Grehl, C.** (2020). *Sewing STEM solutions: E-textiles and crafting as vehicles for improving NGSS based science instruction*. Presented in structured poster session at the Annual Meeting of the American Education Research Association. San Francisco, CA: April, 2020. (Conference canceled due to COVID)
50. *Ball, D., **Tofel-Grehl, C.**, & Searle K. (2020). *Interaction of Student and Teacher Attitudes With In-Classroom Science Maker Projects*. Presented at the Annual Meeting of the American Education Research Association. San Francisco, CA: April, 2020. (Conference canceled due to COVID)
49. **Tofel-Grehl, C.**, *Bennett, B., *Balls, M., *Ball, D., Lott, K., & Longhurst. (2020). *From private conception to professional practice: A cross-case analysis of elementary teachers' scientific misconceptions and how they play out in classroom instruction*. Presented at the Annual Meeting of the Association for Science Teacher Education. San Antonio, TX: January 9-12, 2020.
48. *Ball, D., **Tofel-Grehl, C.**, French, S., *Bennett, B., Longhurst, M., & Lott, K. (2020). *Research experience influence on nature of science understanding*. Submitted to the Annual Meeting of the Association for Science Teacher Education. San Antonio, TX: January 9-12, 2020.
47. *Bennett, B., Longhurst, M., **Tofel-Grehl, C.**, & Lott, K. (2020). *Conceptions of matter from a STEM endorsement*. Submitted to the Annual Meeting of the Association for Science Teacher Education. San Antonio, TX: January 9-12, 2020.
46. Lott, K., **Tofel-Grehl, C.**, & *Mitchell, A. (2020). *Children's Conceptions of Engineers*. Submitted to the Annual Meeting of the Association for Science Teacher Education. San Antonio, TX: January 9-12, 2020.

45. Feldon, D.F., & **Tofel-Grehl, C.** (2020). *Preserving ideographic quality in mixed methodological analysis*. Presented at the Meeting of the Mixed Methods Special Interest Group at the Annual Meeting of the American Education Research Association. San Francisco, CA: April, 2020. (conference canceled due to COVID).
44. **Tofel-Grehl, C.** (2019). *Project STITCH: Engaging middle school students in making for science learning*. Talk presented at the annual National Science Foundation STEM+C PI & Evaluator Summit, Alexandria, VA: September, 2019.
43. **Tofel-Grehl, C.** (2019). *Affordances of e-textiles for shifting beliefs*. Talk presented at the annual National Science Foundation STEM+C PI & Evaluator Summit, Alexandria, VA: September, 2019.
42. **Tofel-Grehl, C.** (2019). *Never the less, they persisted: Engaged students in the face of disengaged teachers*. Poster presented at the annual National Science Foundation STEM+C PI & Evaluator Summit, Alexandria, VA: September, 2019.
41. Searle, K., **Tofel-Grehl, C.**, & Hawkman, A. (2019). *ESTITCH: Developing integrated e-textiles curriculum for upper elementary school*. Poster presented at the annual National Science Foundation ITEST PI & Evaluator Summit, Alexandria, VA: June, 2019.
40. **Tofel-Grehl, C.**, Searle, K., & Hawkman, A. (2019). *Computational migration: Integrating computing and science*. Virtual poster presented at the annual National Science Foundation's STEM for All Video Showcase, Washington, DC: May, 2019.
<https://stemforall2019.videohall.com/presentations/1348>
39. Searle, K., & **Tofel-Grehl, C.** (2019). *Using E-textiles for integrated science learning*. Virtual poster presented at the annual National Science Foundation's STEM for All Video Showcase, Washington, DC: May, 2019. <https://stemforall2019.videohall.com/presentations/1349>
38. **Tofel-Grehl, C.** & Searle, K. (2019). *E-textiles as a vehicle for shifting teachers' private conceptions about student ability and race*. Poster presented at the annual meeting of the American Educational Research Association, Toronto, CA: April, 2019.
37. **Tofel-Grehl, C.**, & Searle, K. (2019). *"Why didn't you teach me this?": One teachers journey with making from preservice into service*. Presented at the annual meeting of the National Association for Research on Science Teaching. Baltimore, MD: March, 2019.
36. **Tofel-Grehl, C.**, *Ball, D., Searle, K., & Cannell, C. (2019). *Making a science and computing escape room*. Workshop presented at the Annual Flagship Meeting of FabLearn. New York, NY: March, 2019.
35. Feldon, D.F., & **Tofel-Grehl, C.** (2018). *Preserving ideographic quality in mixed methodological analysis*. Paper presented at the Mixed Methods International Research Association International Conference. Vienna, Austria: August 22-25, 2018.
34. **Tofel-Grehl, C.**, Searle, K. & Feldon, D. (2018). *Professional development for secondary science teachers: A faded scaffolding approach to preparing teachers to integrate computing*. Paper presented at the International Conference of the Learning Sciences. London, UK.
33. Feldon, D. F., & **Tofel-Grehl, C.** (2018). *Phenomenography as a foundation for mixed models research*. Presented in the symposium Methodological Innovations in Mixed Methods Research at the Annual Meeting of the American Education Research Association. New York, NY: April, 2018.
32. **Tofel-Grehl, C.**, *Jex, E., Feldon, D., *Shenoy, A., & Searle, K. (2018). *Changing the fabric of classroom discourse: a quasi-experimental examination of shifting instructional practices through 'Making'*. Presented at the Annual Meeting of the American Education Research Association. New York,

NY: April, 2018.

31. **Tofel-Grehl, C.** (2018). *Big S little T little E little M: Using the TEM to make science happen in schools*. Presented at the Annual Meeting of the National Science Teachers Association. Atlanta, GA: March 15-18, 2018.

30. **Tofel-Grehl, C.**, & Searle, K., Litts, B. & *Olsen, E. (2017). *Workshop on e-textiles in elementary classrooms*. Paper presented at the National Science Teachers Association Conference, Elementary Extravaganza. Los Angeles, CA: March 16, 2018.

29. **Tofel-Grehl, C.** & *Olsen, E. (2018). *Finding the methods in methods education*. Presented at the Annual Meeting of the Association for Science Teacher Education. Baltimore, MD: January 3-6, 2018.

28. **Tofel-Grehl, C.**, & Searle, K. (2017). *Workshop on 'Making' classrooms provide equitable access*. Presented at the 7th Annual FabLearn (Flagship) Conference. Palo Alto, CA: October 21- 22, 2017.

27. *Ball, Doug., **Tofel-Grehl, C.**, & Searle, K. (2017). *Sustaining making in the era of accountability: STEM integration using e-textiles materials in a high school physics class*. Presented at the 7th Annual FabLearn (Flagship) Conference. Palo Alto, CA: October 21-22, 2017.

26. Searle, K., & **Tofel-Grehl, C.** (2017). *"That's something I never expected to deal with in a science class": Teachers' perspectives on integrating computing*. Presented at the International Computing Education Research Conference (ICER). Tacoma, WA: August 18-20, 2017.

25. **Tofel-Grehl, C.** (2017). *Making it into the classroom: Engaging teachers in digital media learning*. Presented at the Digital Media Learning Conference. Irvine, CA: October 4-5, 2017.

24. Kafai, Y., Peppler, K., Clegg, T., Buechley, L., Fields, D., & **Tofel-Grehl, C.** (2017) *Textile messages: Electronic textiles as disruptive designs and inclusive activities*. Presented at the Digital Media Learning Conference. Irvine, CA: October 4-5, 2017.

23. **Tofel-Grehl, C.** & Callahan, C. (2017). *Under pressure: Gifted student stress, drug use, and self-harm at specialized STEM schools*. Presented at the National Association for Gifted Children Annual Conference. Charlotte, NC: November 9-12, 2017.

22. Searle, K., **Tofel-Grehl, C.**, & Allan, V. (2017). *Using electronic textiles to train teachers to build models while teaching core content*. Presented at the Annual Meeting of National Association for Research in Science Teaching. San Antonio, TX: April 22-25, 2017.

21. Lott, K., **Tofel-Grehl, C.**, & Longhurst, M. (2017). *Assessing elementary teachers' conceptions of matter: Best practices that promote increased conceptual understanding*. Presented at the Association of Science Teacher Education National Conference. Des Moines, IA: January 12-14, 2017.

20. **Tofel-Grehl, C.** (2017). *Boiling point: Student pressure at specialized STEM schools*. Paper presented at the 15th Annual Hawaii International Conference on Education. Honolulu, HI: January 6, 2017.

19. **Tofel-Grehl, C.** (2017). *Three-tiered approach to makerspaces in science teacher education*. Paper presented at the 15th Annual Hawaii International Conference on Education. Honolulu, HI: January 6, 2017.

18. **Tofel-Grehl, C.** (2017). *"Making" three-dimensional learning happen: Using maker space technologies to engage the NGSS*. Presented at the Annual Meeting of the National Science Teachers Association. Los Angeles, CA: March 30-April 1, 2017.

17. **Tofel-Grehl, C.** (2017). *Making maker spaces equitable and accessible*. Presented at the Annual Meeting of the National Science Teachers Association. Los Angeles, CA: March 30-April 1, 2017.
16. **Tofel-Grehl, C.**, Callahan, C., & Hunsaker, S. (2016). *'This is what gifted kids need here!': The ways in which teacher belief about giftedness impact classroom instruction within specialized STEM schools*. Presented at the National Association of Gifted Children Annual Conference. Orlando, FL: November 4-5, 2016.
15. *Gu, J., **Tofel-Grehl, C.**, Fields, D., *Sun, C., & Maahs-Fladung, C. (2016). *Let them sew: Improving student interest in science*. Paper presented at the Annual Meeting of the American Educational Research Association. Washington, DC: April 8-12, 2016.
14. **Tofel-Grehl, C.** & Callahan, C., (2016). *'I own it!': The influence of agency on discourse patterns in STEM schools*. Paper presented at the Annual Meeting of the American Educational Research Association. Washington, DC: April 8-12, 2016.
12. **Tofel-Grehl, C.**, & Fields, D., (2016). *Sewing science: Using electronic textiles technology to teach electricity and circuits*. Paper presented at the National Science Teacher Association National Conference. Nashville, TN: March 31-April 3, 2016.
11. **Tofel-Grehl, C.** (2016). *Sewing in the science: Using electronic textiles and maker space technologies to improve science teacher education*. Presented at the Association for Science Teacher Education Conference. Reno, NV: January 7-9, 2016.
10. **Tofel-Grehl, C.** & Callahan, C. (2015). *Language of the gifted: Questioning patterns within specialized STEM schools as a teacher mechanism for encouraging higher order thinking*. Presented at the National Association of the Gifted Child Conference. Phoenix, AZ: November 12-15, 2015.
9. **Tofel-Grehl, C.** (2015). *Sewing in the science: Using electronic textiles to improve science teacher education programs*. Presented at the APLU Science and Mathematics Teacher Initiative National Conference. New Orleans, LA: June 3-4, 2015.
8. **Tofel-Grehl, C.**, & Fields, D., (2015). *Sewing science: Crafting technology for teaching science*. Presented at the National Science Teacher Association STEM Forum & Expo. Minneapolis, MN: May 20-23, 2015.
7. **Tofel-Grehl, C.**, Callahan, C. & *Ducamp, G. (2014). *STEM high schools in the United States: Teacher belief regarding STEM student giftedness*. Presented at the National Association of the Gifted Child Conference. Baltimore, MD: November 13-16, 2014.
6. **Tofel-Grehl, C.** (2014). *Feedback for effective instruction: How to tell students they are wrong*. Presented at the 2nd Annual International Visible Learning Conference. San Diego, CA: July 11-12, 2014.
5. **Tofel-Grehl, C.**, & Callahan, C. (2014). *Variations in the intensity of specialized science, technology, engineering, and mathematics (STEM) high schools*. Paper presented at the annual meeting of the American Educational Research Association. Philadelphia, PA: April 6, 2014.
4. Forman, J., Gubbins, J., Bruce-Davis, M., Villanueva, Massicotte, M., Callahan, C., & **Tofel-Grehl, C.** (2014). *Firsthand STEM inquiry for all? Student research opportunities in selective and inclusive STEM schools*. Paper presented at the 2014 meeting of the American Educational Research Association. Philadelphia, PA: April 6, 2014.

3. Gubbins, E., Callahan, C., Bruce-Davis, N., Gilson, C. Villanueva, M., Foreman, J., & **Tofel- Grehl, C.** (2013). *STEM schools of excellence: Unique characteristics and effective strategies*. Presented at the National Association of the Gifted Child Conference. Indianapolis, IN: August 6, 2013.

2. **Tofel-Grehl, C.**, & Callahan, C. (2013). *Specialized STEM high school programs: What makes them special*. Paper presented at the annual meeting of the American Educational Research Association. San Francisco, CA: April, 2013.

1. **Tofel-Grehl, C.**, & Feldon, D. F. (2013). *Cognitive task analysis-based training: A meta- analysis of studies*. Paper presented at the annual meeting of the American Educational Research Association. San Francisco, CA: April, 2013.

State & Regional Presentations

10. Searle, K., **Tofel-Grehl, C.**, & Hawkman, A. (2019) Pursuing and Embodying Inclusivity in Research. Presented at the Utah State University's 2019 Inclusive Excellence Symposium. October 2019.

9. *Ball, D., **Tofel-Grehl, C.**, & Cannell, C. (2019) *Rallying Student Interest Through Maker Science Education*. Presented at the National Science Teachers' Association Regional Meeting. Salt Lake City, UT. October, 2019.

8. Lott, K., **Tofel-Grehl, C.**, & *Mitchell, A. (2019) *ASEE Session: Early Childhood Engineering Encounters*. Presented at the National Science Teachers' Association Regional Meeting. Salt Lake City, UT. October, 2019.

7. **Tofel-Grehl, C.**, Searle, K., Hawkman, A., *Ball, D., *Breitenstein, J., & Cannell, C. (2019) *Electrifying Human Migration: Bridging Social Studies and Science Content*. Presented at the National Science Teachers' Association Regional Meeting. Salt Lake City, UT. October, 2019.

6. **Tofel-Grehl, C.** (2017) *Creating faded scaffolds for chemistry instruction*. Presented at the Utah State University Chemistry Department Symposium. Logan, UT.

5. **Tofel-Grehl, C.** (2016). *Preparing preservice teachers to meaningfully integrate new technologies using faded scaffolds and worked examples*. Presented at the Utah Council of Education Deans Annual Conference. Salt Lake City, UT.

4. **Tofel-Grehl, C.**, & Feldon, D. (2016). *Worked examples and faded scaffolds*. Presented at the Utah State University Empowering Teaching Excellence Faculty Conference. Logan, UT.

2. *Gu, J., **Tofel-Grehl, C.**, & Fields, D. (2015). *Let them sew: Improving student interest in science*. Presented at the Utah State University STE²M Center Making Innovation Makerspace Conference. Logan, UT.

2. **Tofel-Grehl, C.** (2015). *Science and art: Using paper circuits for self-expression*. Presentation to Utah State University Latino Discovery Program Day. Logan, UT.

1. **Tofel-Grehl, C.** (2014). *Decision making calculus of STEM high school students: How they choose*. Paper presented at the University of Utah Bird in The Hand Symposium, Salt Lake City, UT.

Invited Talks

11. Tofel-Grehl, C. (2021). *Project ESTITCH: Elementary STEM Teaching Integrating Technology and Computing Holistically*. Honorary talk requested by the NSF Program Officers presented at the National Science Foundation's Annual Principal Investigator Meeting for the ITEST Program. Alexandria, VA.

10. Cutler, R., Posselt, J., Feldon, D., Okhana, H., Griffin, K., & **Tofel-Grehl, C.** (moderator) (2021). *Equity in Graduate Education* Panel presented via zoom at Utah State University. Logan, UT.

9. **Tofel-Grehl, C.**, & Searle, K. (2020) *Project E-STITCH: Connecting curriculum and computational thinking for equitable access*. Talk presented at the Preparing Computationally Literate Pre-Service Teachers Project for the University of Delaware. Via zoom. October, 2020.

8. **Tofel-Grehl, C.**, (2020) *Teaching da Vinci: Using making to integrate art across the curriculum*. Keynote talk presented at the University of Maryland Department of Education Arts Integration Conference. Baltimore, MD. February, 2020.

7. **Tofel-Grehl, C.** (2019) *Petticoats and processors: Using computer to design clothing, costumes, and other craft based projects for increasing STEM learning and interest*. Talk presented to the Cache Valley Chamber of Commerce Women's Conference. Logan, UT. October, 2019.

6. **Tofel-Grehl, C.** (2018). *Engaging teachers in making to support content learning in science*. Talk presented to Santa Ana School District Administration at University of California, Irvine. Irvine, CA. February, 2018.

5. **Tofel-Grehl, C.** (2018). *Making science instruction engaging and effective*. Talk presented University of Indiana, Bloomington. Bloomington, IN: January 15, 2018.

4. **Tofel-Grehl, C.** (2018). *Crafting effective science instruction*. Talk presented at University of Pennsylvania. Philadelphia, PA: January 16, 2018.

3. **Tofel-Grehl, C.** (2017). Using E-textiles to further core STEM content integration with computing. Talk presented to the Open University. London, UK: November 24, 2017.

2. **Tofel-Grehl, C.** (2017). *Electronic textiles for facilitating equity and diverse access in STEM for underrepresented groups of women*. Georgia State University. Atlanta, GA. January, 2017.

1. **Tofel-Grehl, C.** & Longhurst, M., (2015). Using maker space technologies as a classroom teacher (Keynote). Presented at the Utah State University STE2M Center Making Innovation Makerspace Conference. Logan, UT.

Service

University

2021

- University Faculty Advisory Committee to the Office of Equity on Title IX

2020

- A. Deliman's Tenure Advisory Committee member
- School of Teacher Education and Leadership Qualitative Research Taskforce
- Emma Eccles Jones College of Education and Human Services Awards Committee for Researcher of the Year
- School of Teacher Education and Leadership Awards Committee Chair
- School of Teacher Education and Leadership Scholarship Review Committee Member
- School of Teacher Education and Leadership Scholarship Selection Committee Member
- School of Teacher Education and Leadership Jewish Holiday Calendar Coordinator

2019

- Ad hoc Teacher Education and Leadership Course Review Committee: 7300
- Ad hoc Teacher Education and Leadership Qualitative Methods Committee Member
- College of Education and Human Services Hazard Committee Member
- Teacher Education and Leadership Awards Committee Chair.

- Teacher Education and Leadership Scholarship Review Committee Member
- Teacher Education and Leadership Scholarship Selection Committee Member
- Teacher Education and Leadership Awards Committee Chair
- School of Teacher Education and Leadership Jewish Holiday Calendar Coordinator
- Utah State University MESA (Mathematics, Engineering, Science Achievement) Program Coordinator
- Science Education Ph.D. Program Coordinator
- Teacher Education and Leadership Teaching Mentor for TEAL 5210

2018

- Teacher Education and Leadership Graduate Program Advisory Committee Member
- Teacher Education and Leadership Awards Committee Chair
- Utah State University MESA (Mathematics, Engineering, Science Achievement) Program Coordinator
- Science Education Ph.D. Program Coordinator

2017

- Developed Science Education Ph.D. Program
- Coordinator of Science Education Ph.D. Program
- Dean's Committee for Review of Secondary Teacher Education Review
- Search Committee for Secondary Social Studies Job Search
- Secondary Faculty Committee Member
- Judge for USU Student Research Conference
- Graduate Faculty Committee Member
- Undergraduate Faculty Committee Member

2016

- Dean's Committee for Review of Secondary Teacher Education Review
- Search Committee for Secondary Social Studies Job Search
- Committee to revise Administration Manual for Student Teaching Supervisors
- Judge for USU Student Research Conference
- Graduate Faculty Committee Member
- Undergraduate Faculty Committee Member

2015

- Graduate Faculty Committee Member
- Undergraduate Faculty Committee Member
- Hiring Committee for Salt Lake Secondary ARL lecturer
- Facilitator and Discussant for The Latino Discovery Day STEM Learning
- Judge recruitment for Bridgerland Science and Engineering Fair
- Chair of the Ad hoc Committee for the Student Teaching Seminar in TEAL

2014

- Chair of the Ad hoc Committee for the Student Teaching Seminar in TEAL

2013

- Hiring committee for the Directorship of the Emma Eccles Early Childhood Center on campus

Organization or Field

2021

- AERA Science Teaching and Learning SIG Treasurer
- NSF Panel Reviewer for multiple panels
- Organizing Committee for 2021 International Conference of the *Association of Science Teacher Educators*
- Strand Coordinator for 2020 International Conference of the *Association of Science Teacher Educators*
- Editorial Board and reviewer for *Journal of Science Teacher Education*
- Editorial Board and reviewer for *Innovations in Science Teaching Journal*
- Editorial Board and reviewer for *International Journal of Multiple Research Methods*

2020

- AERA Science Teaching and Learning SIG Treasurer
- NSF Panel Reviewer for multiple panels
- Organizing Committee for 2020 International Conference of the *Association of Science Teacher Educators*
- Strand Coordinator for 2020 International Conference of the *Association of Science Teacher Educators*
- Educators Ad hoc member of the Equity Committee for the *Association for Science Teacher Education*.
- Editorial Board and reviewer for *Journal of Science Teacher Education*
- Editorial Board and reviewer for *Innovations in Science Teaching Journal*
- Editorial Board and reviewer for *International Journal of Multiple Research Methods*
- Track chair and reviewer for full paper track of the *International Flagship Fablearn Conference, Columbia University*.
- *American Educational Research Education* SIG Treasurer (3 year term) for the Science Teaching and Learning.

2019

- Organizing Committee for 2020 International Conference of the *Association of Science Teacher Educators*
- National Science Foundation Panel Reviewer for STEM+C Program
- National Science Foundation Ad hoc Reviewer for Special Programs
- Reviewer for *ACM Transactions on Computing Education*
- Editorial Board and reviewer for *Journal of Science Teacher Education*
- Editorial Board and reviewer for *Innovations in Science Teaching Journal*
- Reviewer for *Journal of Science Education and Technology*
- Editorial Board and reviewer for *International Journal of Multiple Research Methods*
- Reviewer for *Journal of STEM Education, Research and Practice*
- Reviewer for *FabLearn* Conference Full Papers Panel
- NSF Panel Reviewer for AISL Program
- Chair for Demo and Workshops track for the Flagship FabLearn Conference 2019

2018

- NSF Panel Reviewer
- Reviewer for the *International Conference of the Learning Sciences*
- Reviewer for the *Connected Learning Summit*

- Reviewer for *Roeper Review*

2017

- Reviewer for *Journal of Science Education and Technology*
- Reviewer for the National Association of Research in Science Teaching National Conference
- Reviewer for *Journal of STEM Education, Research and Practice*
- Reviewer for *FabLearn* Conference Full Papers Panel
- NSF Panel Reviewer
- Advisory board member for Yasmin Kafai's ITEST grant
- Advisory board member for LACES CTE grant project

2016

- Reviewer for *Journal of Science Education and Technology*
- Reviewer for the National Association of Research in Science Teaching National Conference
- Reviewer for *Teacher Education Quarterly*
- Editorial Board and reviewer for *Innovations in Science Teaching Journal*
- Reviewer for *Journal of STEM Education, Research and Practice*
- Reviewer for *FabLearn* Conference Short Papers Panel
- NSF STEM+C Panel Reviewer
- Advisory board member for Yasmin Kafai's ITEST grant
- Advisory board member for LACES CTE grant project
- Reviewer for *Teacher Education Quarterly*

2015

- Reviewer for *Teacher Education Quarterly*
- Reviewer for *Journal of STEM Education, Research and Practice*
- Science Teaching and Learning SIG Reviewer for the American Educational Research Association Conference
- Division C-Curriculum and Instruction Science Reviewer for the American Educational Research Association Conference
- Curriculum development for STEM-U professional development at USU
- Advisory board member for Yasmin Kafai's ITEST grant
- Advisory board member for LACES CTE grant project

2014

- Reviewer for *Journal of Advanced Academics*
- Member of STEM Action Center Committee on STEM School Standards
- Nominated for chair of Gifted, Creativity, and Talented SIG for AERA
- Advisory board member for ITEST Grant "E-textiles for Promoting Computer Science in High Schools."
- Review of Beth Jordan's dissertation validity assessments

Doctoral Student Committee Service (*Chair; *Italics indicates current*)

*Tyler Hansen**

Gabriella DuCamp

Alex Hilbrand

David Joy

Lauren Burton

Brenda Bennett

Ashley Strong

Eric Jorgensen

Bryce Day

Kristy Lister

*Douglas Ball**

April Mitchell

Sarah Urghart

Ryan Caine
Janet Breitenstein
Katie Lundell*
Vicky Lyons
Melia Balls

Victor Larsen
Georgia Burnell
Kent Hoffman
Tanner Robinson
Liam Fischback

Graduate Student Mentorship

Tyler Hansen (2019-present) Tyler worked as a graduate research assistant on ESTITCH under my supervision.

Katie Lundell (2019-present) Katie worked as a graduate research assistant on Dr. Susannah French's career grant under my supervision. She also works as a graduate research assistant on the E- STITCH grant under my supervision.

Liam Fischback (2019-present) Liam works as a graduate research assistant on the E- STITCH grant under my supervision. He is working with me on data collection and analysis.

Georgia Burnell (2019) Georgia worked on research with me during her department funded research experience.

Janet Breitenstein (2018-2019) Janet works as a graduate research assistant on the E- STITCH grant under my supervision. She is working with me on developing an integrated STEM curricular unit for elementary teachers to teach science and social studies content through e-textiles.

April Mitchell (2018) April worked as a graduate research assistant on the E-STITCH grant under my supervision. She is working with me on developing an integrated STEM curricular unit for elementary teachers to teach science and social studies content through e-textiles. I also mentor April in her teaching of TEAL 5210.

Ryan Cain (2018) Ryan was a graduate teaching assistant working under my supervision for SCED 3400.

Rohit Gopalan (2017-2018) Rohit worked on developing an app for teachers to engage curriculum.

Kirkman Amos (2017-2018) Kirk has worked as a masters' research assistant focusing on learning qualitative research methods and data collection.

Doug Ball: 2017-present: Doug has worked as a doctoral research assistant under my supervision and advisement focusing on the ways in which electronic textiles improve learning around electric potential and potential difference.

David Joy (2013-2016) Developing grant proposal for Havasa Tribe STEM project in which he develops a qualitative design for exploring the potential impacts of outdoor education on tribal lands on science content learning at the high school level.

Vincent Sun (2014- 2016) Design and analysis of the discourse patterns of STEM schools across Utah.

Grace Gu (2015-2016) Development of an instructional technology curriculum for 6-12th grade science using electronic textiles. Much of my research work with Grace focused on developing her skills as an academic writer and her skills of analysis of data.

Michael Oliva (2015-2016) Research assistantship focused on integrating qualitative and quantitative data in the exploration of electronic textiles within K-12 learning environments.

Undergraduate Student Research Mentorship (n=10)

Abby Hawkman (2020- present) Abby works on data management and coding within the Chaos Learning Lab. Funded on Project E-STITCH

Nizhoni Warren (2019- 2020) Nizhoni works with our lab group on various research for undergraduate experiences at USU Eastern. Funded on Project E-STITCH

Michael Hernandez (2018- present) Michael works as an undergraduate research assistant on the E-STITCH grant under my supervision and advisement. He is working on analyzing data related to student identity across projects. He also co-leads our LGBTQ maker classes. Funded on Project E-STITCH

Taryn Somers (2018-present) Taryn works as an undergraduate research assistant on the E-STITCH grant under my supervision and advisement. She is working with me on developing integrated art and STEM curricular unit for elementary. Funded on Project E-STITCH

Tyler Brower (2018-present) Tyler works as an undergraduate research assistant on the E-STITCH grant under my supervision and advisement. He is working with me on developing an integrated STEM curricular unit for elementary teachers to teach science and social studies content through e-textiles. . Funded on Project E-STITCH

Zac Coones (2018) Zac worked on teacher professional development for preparation and materials preparation. Funded on Project STITCH

Justin Wheeler (2018) Justin worked on designing projects and escape room puzzles for curricular materials. Funded on Project STITCH

Sarah Sanders (2017-2018) Sarah worked as a research assistant and an undergraduate research fellow for science methods 4400. Her research work focused on curriculum development and teacher training. . Funded on Project STITCH & ESTITCH

Kati Mattison (2016-2017) Kati worked as a summer research assistant and an undergraduate research fellow for science methods 3400. Her research work focused on syllabus review and analysis as part of improving the secondary science methods classes as well as developing a meta analytic lens for examining science methods classes nationally. Funded on Project STITCH

Eliza Ward (2016-2017) Eliza collected data a school based project and prepared materials for teachers and students in classrooms. Funded on Project STITCH

Emily Olsen (2015-2018) Designing and implementing researching for her undergraduate honors contracts and thesis. Her research project focuses on a mixed methods comparative analysis of two programs for tutoring students in chemistry. Funded on Project STITCH

University Teaching History

Fall 2020: Utah State University TEAL, Logan UT

EDUC 6700: Qualitative Research (3 credits)

SCED 5210: Assessment and Learning Theory (3 credits)

Spring 2020: Utah State University TEAL, Logan UT

TEAL 4300/TEAL 6740: Science Teaching Clinical Placement 1 (1 credit)

SCED 4400/SCED 5820: Teaching Science (3 credits)

SCED 5210: Assessment and Learning Theory (3 credits)

Fall 2019: Utah State University TEAL, Logan UT

TEAL 3300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 3400/SCED 5820: Teaching Science (3 credits)

SCED 5210: Assessment and Learning Theory (3 credits)

Spring 2019: Utah State University TEAL, Logan UT

EDUC 6800: Mixed Methods Research Design (3 credits)

TEAL 7820: Misconceptions in Science Education (3 credits)

Fall 2018: Utah State University TEAL, Logan UT

TEAL 7820: Journal Readings in Science Education (3 credits)

TEAL 3300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 3400/SCED 5820: Teaching Science: Methods 2 (3 credits)

EDUC 6770: Qualitative Research Methods (3 credits)

Spring 2018: Utah State University TEAL, Logan UT

TEAL 4210: Assessment and Curriculum Design (3 credits)

TEAL 4300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 4400/SCED 5820: Teaching Science: Methods 2 (3 credits)

Fall 2017: Utah State University TEAL, Logan UT

TEAL 7820: Journal Readings in Science Education (3 credits)

Spring 2017: Utah State University TEAL, Logan UT

EDUC 6800: Mixed Methods Research Design (3 credits)

TEAL 4300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 4400/SCED 5820: Teaching Science: Methods 2 (3 credits)

Fall 2016: Utah State University TEAL, Logan UT

TEAL 3300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 3400/SCED 5820: Teaching Science: Methods 2 (3 credits)

SCED 5500: Science Student Teaching Seminar (2 credits)

Summer 2016: Utah State University TEAL, Logan UT

TEAL 6560 KT1: Energy in STEM (3 credits)

TEAL 6560 KT2: Energy in STEM (3 credits)

Spring 2016: Utah State University, TEAL, Logan UT

TEAL 4300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 4400/SCED 5820: Teaching Science: Methods 2 (3 credits)

TEAL 7900: Independent Study for Doctoral student Science Education (3 credits) – Karen Ray

Fall 2015 Utah State University TEAL, Logan UT

TEAL 3300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 3400/SCED 5820: Teaching Science: Methods 2 (3 credits)

Spring 2015 Utah State University, TEAL, Logan UT

TEAL 4300/TEAL 6720: Science Teaching Clinical Placement 1 (1 credit)

SCED 4400/SCED 5820: Teaching Science: Methods 2 (3 credits)

SCED 5500: Science Student Teaching Seminar (2 credits)

TEAL 7900: Independent Study for on Science Education Research (3 credits) - Chongning Sun

SCED 6700: Improving Science Instruction for Masters' students (3 credits)

Fall 2014: Utah State University, TEAL, Logan, UT

TEAL 3300/TEAL 6720: Science Clinical Placement 1 (1 credit)

SCED 3400/SCED 5820: Teaching Science Methods 1 (3 credits)

SCED 5500: Science Student Teaching Seminar (2 credits)

TEAL 7900: Independent Study for on Science Education Research (3 credits) - Chongning Sun

Spring 2014: Utah State University, TEAL, Logan, UT

SCED 5500: Science Student Teaching Seminar (2 credits)

Supervision of Practicum Students: Secondary Science Education (2 credits)

SCED 6480: Materials and Methods in Gifted Education* (3 credits)

* Co-Instructor of Record

Spring 2010: Fall 2012: University of Virginia, Charlottesville VA

EDIS 2020: Instruction and Assessment, *Spring 2011* (Instructor: Ellie Wilson)

EDIS 5320: Mathematics in Elementary Schools, *Spring 2010* (Instructor: Robert Q. Berry)

EDIS 5330: Science in the Elementary Schools, *Fall 2009* (Instructor: Robert Tai)