CESAR DELGADO, ASSOCIATE PROFESSOR
https://scholar.google.com/citations?user=-SiTMfMAAAAJ&hl=en&oi=ao

Department of STEM Education
North Carolina State University
1010 Main Campus Dr., Raleigh, NC 27606
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ORCID: 0000-0002-8873-9920

EDUCATION

PhD, Educational Studies (Science Education), *University of Michigan,* Ann Arbor, MI 2009
Dissertation: *Development of a research-based learning progression for middle school through undergraduate students' conceptual understanding of size and scale.*
Chair: Joseph Krajcik
46 citations - Google Scholar 12/18/2024

MS, Chemistry, *University of Michigan,* Ann Arbor, MI 2008

MA, Educational Studies (Learning Technologies), *University of Michigan*, Ann Arbor, MI 2008

MA, Secondary Education, *University of Alabama,* Tuscaloosa, AL 2003

BS, Chemical Engineering, *University of California at Los Angeles*, Los Angeles, CA

PROFESSIONAL APPOINTMENTS

Associate Professor with Tenure 2018-present
Assistant Professor 2015-2018
STEM Education
North Carolina State University

Assistant Professor 2009-2015
Department of Curriculum and Instruction, Science and Mathematics Education
University of Texas at Austin

Research Assistant
Instructional Development & Education Assessment Institute2008
National Center for Learning and Teaching in Nanoscale Science and Engineering 2006-2009
BioKIDS 2004-2005
University of Michigan

K-12 TEACHING EXPERIENCE

Science Teacher, American School Foundation, Mexico City, Mexico 2001-2004
Accredited by Southern Association of Colleges and Schools (SACS)
Science Teacher, Westwood Institute, Mexico City, Mexico 1998-2001
Accredited by SACS
Science Teacher, Colegio Peterson, Mexico City, Mexico 1997-1998

HONORS, AWARDS, AND COMPETITIVE FELLOWSHIPS

Advisee (Gary Wright): NARST Outstanding Dissertation Research Award 2023
"The Outstanding Doctoral Research Award (ODRA) is the highest award that NARST bestows on a dissertation judged …to have the greatest significance in the field of science education research from among all dissertations nominated for the award that year."

Part-Time Graduate Student Research Project. Competitive NCSU College of Education award to fund graduate student research. $1000. 2022, 2023

Outstanding Teacher Award, NCSU 2019

Publons Top Peer Reviewer (top 1% social sciences, #7 in world and #2 in US for science education) 2019

Dean's Fellowship, College of Education, The University of Texas at Austin 2013
Two-course release and $3000 research stipend.

Early Career Workshop, International Conference of the Learning Sciences (ICLS) 2012
Sydney, Australia. Included $1750 travel stipend through NSF.

School of Education Scholar's Award and Rackham Merit Fellowships 2004-2009
University of Michigan.

Doctoral Consortium, International Conference of the Learning Sciences (ICLS) 2008
Utrecht, Holland. Included $1500 travel stipend through NSF.

Equity Scholar Award, National Association for Research in Science Teaching (NARST), 2008.
Baltimore, MD. $500 travel stipend through NARST.

Social Science Summer Training Award, Institute for Social Research. Ann Arbor, MI 2007
Tuition waiver

Middle School Teacher of the Year; High School Co-Teacher of the Year 2000
Westhill Institute, Mexico City, Mexico.

RESEARCH METRICS

h-index: 20 (20 publications cited at least 20 times)(Google Scholar 1/22/2026)
i10-index: 32 (32 publications cited at least 10 times)(Google Scholar 4/24/2025)
g-index: 42 (top 42 publications cited 42 times on average)(Google Scholar 7/2/2026)
1845 citations (Google Scholar 7/2/2026)
64 publications with citations (Google Scholar 7/2/2026)
One paper in **top 1 percent** of citations in category – InCites Clarivate Analytics 1/31/25
Three papers in **top 3 percent** of citations in category – InCites Clarivate Analytics 1/31/25
Five papers in **top 10 percent** of citations in category – InCites Clarivate Analytics 1/31/25
One top-cited article, *Science Education*, 2023
One top-cited article, *Journal of Research in Science Education*, 2024

PATENTS
Provisional patent #63/145511: "Automated Partial-Credit Grading System and Method"
Patent Cooperation Treaty patent application PCT/US2022/015270: “Computerized Partial Grading System and Method”

START-UP COMPANY
Grade-It, Inc. Developing an automated partial-credit grading system. CEO and founder.

RESEARCH GRANT ACTIVITY
Funded, External
Co-Principal Investigator (with co-PI Matthew Peterson and PI Karen Chen, NCSU).
NSF EHR CORE 2055680. *Virtual Reality to Improve Students’ Understanding of the Extremes of Scale in STEM.*
2021-July 2025. Amount $1,342,682.

Co-Principal Investigator (with co-PI Collin Lynch and PI Kevin Han, NCSU)
NSF IGE 2105555. *Learning the Entire Pipeline: Analyzing and Improving Graduate Engineering Education through Communities of Practice.*
2021-2024. Amount $ $332,184.

Funded, Internal
Spark Plug, Office of Research Commercialization, NC State. Grant. Amount: $5000.

Co-Principal Investigator (with Gail Jones, PI, and Sarah Carrier, LaTricia Townsend, and Jill Grifenhagen, co-PIs). CATALYST grant: A Sense of Awe: A Tool for Enhancing Science Instruction. Awarded January 13, 2020. Amount: $5000.

Principal Investigator (with Soonhye Park and Gail Jones, co-PIs).
NCSU Foundation Grant: *Supporting Underserved Students in Science Education Through Graduate Studies for In-Service Teachers.* Awarded August 15, 2016. Amount: $24,000.

Principal Investigator.
71967 NCSU Faculty Research and Professional Development (FRPD: *Professional Development to Increase Teachers’ Ability to Support English Language Learners’ STEM Achievement.* Awarded 2016. Amount: $6000

Principal Investigator.
UT Austin Faculty Summer Research Grant and Special Research Grant. *Cross-cultural Comparison of Metric-Native and English-Native Middle and High School Students' Conceptions of Size and Scale.* Awarded 2010. Amount $13,850

DEVELOPMENT GRANT ACTIVITY
NSF I-Corps/NCSU Sweat Equity Challenge awardee 2020

From Boundaries To Breakthroughs: Harnessing faculty research & innovation 2025
Nine-week entrepreneurship course supported by NC IDEA and NC Innovation

PUBLICATIONS IN PEER-REVIEWED JOURNALS (35)
* Co-author was a graduate student at the time of submission

J1. You, H., Park, S., **Delgado,** C., Yang, S.H. (2026). Advancing interdisciplinary science education: Validating the Interdisciplinary Science Assessment of Carbon Cycling II through internal structure and external factors. *Research in Science Education.* https://doi.org/10.1007/s11165-026-10337-6. (RISE is a quartile-1 journal. 2024 ISI impact factor = 2.3. Rank 156/762 in Education and Educational Research journals.)

J2. Castro, A., Diaz, B., Aguilera, C., & **Delgado, C.** (2025, early view). Using an engineering design approach to implement interdisciplinary integration of sustainability, energy, and material science: The experience of rural, multigrade elementary schools. *Journal of Chemical Education.* DOI: 10.1021/acs.jchemed.5c00715
(JChEd is a quartile-1 journal. Rank 53/241 in Chemistry, Interdisciplinary.)

J3. Díaz, B., **Delgado, C**., Bacher, J., Lynch, C., Han, H. (2025). Analyzing the functioning of a graduate engineering class with multiple collaborating groups using Slack: An embedded mixed methods research. *International Journal of STEM Education, 12*, 49. *https://doi.org/10.1186/s40594-025-00571-1.* (IJSTEM is a leading Q1 journal, ranked 11 of 760 in Education and Educational Research and 2 of 86 in Education, Scientific Disciplines, ISI impact factor = 5.6)

J4. Harper-Gampp, T., **Delgado, C.**, You, H., Peterson, M., & Chen, K.B. (2026). Measuring size and scale: The development and validation of the Assessment of Size and Scale Cognition (ASSC). *Research in Science Education, 56*(2). https://doi.org/10.1007/s11165-025-10274-w
(RISE is a quartile-1 journal. 2023 ISI impact factor = 2.2. Rank 169/760 in Education and Educational Research journals.)

J5. Díaz, B., Chen, G., Jaselskis, E., **Delgado, C**. (2025). Exploring the pedagogical role of ChatGPT's integration in engineering classes. *Comunicar, 33*(82), 46-61. 10.5281/zenodo.15993999
(Comunicar is a quartile-1 journal. 2023 ISI impact factor = 5.1. Rank 13/760 in Education and Educational Research journals.)

J6. Diaz*, B., & **Delgado, C.**, Han, K., & Lynch, C. (2025, early view). A scaffolding model for designing and implementing Work-Integrated Learning experiences through the analysis of the university and company's arrangements. *Higher Education*. https://doi.org/10.1007/s10734-025-01442-y
(Higher Education is a quartile-1 journal. 2022 ISI impact factor = 5.0. Rank 23/269 education and educational research journals.)
1 citation - Google Scholar 10/14/2025

J7. Díaz*, B., Lynch, C., **Delgado, C**., Han, K. (2025). Analysis of two pedagogical approaches to foster discipline integrations in an educational data mining class using communities of practice. *International Journal of STEM Education, 12*, 17 https://doi.org/10.1186/s40594-025-00538-2.
(IJSTEM is a leading Q1 journal, ranked 11 of 760 in Education and Educational Research and 2 of 86 in Education, Scientific Disciplines, ISI impact factor = 5.6)

3 citations - Google Scholar 10/14/2025

J8. Diaz*, B., **Delgado, C.** (2024). Artificial intelligence: Tool or teammate? *Journal of Research in Science Teaching 61*(10), 2575-2584. https://doi.org/10.1002/tea.21993
(JRST is the top-ranked science education empirical research journal. 2022 ISI impact factor = 4.6. Rank 32/269 education and education research journals. Acceptance rate: 12.5%)
6 citations - Google Scholar 10/14/2025

J9. Diaz*, B., **Delgado, C.**, Han, K., & Lynch, C. (2024). Using communities of practice to investigate work-integrated learning in engineering education: A grounded theory approach. *Higher Education 88,* 2419–2443. https://doi.org/10.1007/s10734-024-01225-x
(Higher Education is a quartile-1 journal. 2022 ISI impact factor = 5.0. Rank 23/269 education and education research journals.)
8 citations - Google Scholar 10/14/2025
In top 20 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J10. Wright*, G., **Delgado, C.,** & Rende, R. (2024). Exploring the impact of an intervention on pre-service science teachers' attitudes and beliefs about gender and sexual diversity-inclusive science teaching. *Journal of Research in Science Teaching 61*(8), 2011-2045.https://doi.org/10.1002/tea.21942.
5 citations - Google Scholar 10/14/2025
In top 20 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025. A top-ten cited paper in *Science Education* 2024.

J11. Wright*, G., & **Delgado, C.** (2023). Generating a framework for gender and sexual diversity‐inclusive STEM education. *Science Education, 107,* 713– 740. https://doi.org/10.1002/sce.21786.
(Science Education is a quartile-1 science education research journal. 2021 ISI Impact factor = 6.00. Rank 14/270 education and education research journals. Highest ranked science education journal in 2021.)
42 citations - Google Scholar 10/14/2025
In top 3 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025. A top-ten cited paper in *Science Education* 2023.

J12. Jones, M. G., Nieuwsma*, J., Rende, K., Carrier, S., Refvem*, E., **Delgado, C.**, Grifenhagen, J., & Huff*, P. (2022). Leveraging the epistemic emotion of awe as a pedagogical tool to teach science. *International Journal of Science Education, 44*(16), 2485-2504. https://doi.org/10.1080/09500693.2022.2133557
(IJSE is an ISI-indexed education research journal with 2021 impact factor = 2.241)
21 citations - Google Scholar 10/14/2025
In top 17 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J13. You, H. S., Park, S., Marshall, J., & **Delgado, C.,** (2022). Interdisciplinary Science Assessment of Carbon Cycling: Construct validity evidence based on internal structure. *Research in Science Education, 52*, 473-492. https://doi.org/10.1007/s11165-020-09943-9
(RISE is a quartile-1 education research journal. 2020 impact factor = 5.439, rank 9/265. Highest ranked science education journal in 2020.)
4 citations - Google Scholar 12/18/2024

J14. You, H.-S., **Delgado, C., &** DeAtley*, K. (2021). Experts' model-based reasoning and interdisciplinary understanding of carbon cycling. *International Journal of Research in Education and Science, 7*(2), 562-579. https://doi.org/10.46328/ijres.1494
(IJRES is a peer-reviewed scholarly online journal, listed in Scimago journal rankings.)
8 citations - Google Scholar 10/14/2025

J15. Smith, C., & **Delgado, C.** (2021). Developing a model of graduate teaching assistant teacher efficacy: How do high and low teacher efficacy teaching assistants compare? *CBE - Life Sciences Education 20*(1), 1-10. https://doi.org/10.1187/cbe.20-05-0096
(CBE-Life Sciences Education is a quartile-1 education research journal. 2020 ISI Impact factor = 3.325, rank 10/44 education-scientific disciplines research journals.)
22 citations - Google Scholar 10/14/2025
In top 31 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J16. Green, K., & **Delgado, C**. (2021). Crossing cultural borders: Results of an intervention on community college biology students' understanding and acceptance of evolution. *International Journal of Science Education 43*(4), 469-496. https://doi.org/10.1080/09500693.2020.1869854.
(IJSE is an ISI-indexed education research journal with 2020 impact factor = 2.241)
21 citations - Google Scholar 10/14/2025
In top 20 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J17. Peterson, M., **Delgado, C.,** Tang, K.-S., Norville, K.*, & Bordas*, C. (2021). A taxonomy of cognitive image functions for science curriculum materials: Identifying and creating 'performative' visual displays. *International Journal of Science Education, 43*(2)*,* 314-343. https://doi.org/10.1080/09500693.2020.1868609.
(IJSE is an ISI-indexed education research journal with 2020 impact factor = 2.241)
26 citations - Google Scholar 10/14/2025
In top 26 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J18. You, H. S., Park, S., & **Delgado, C**. (2021). A closer look at US schools: What characteristics are associated with scientific literacy? A multivariate multilevel analysis using PISA 2015. *Science Education, 105*(2), 205-468. https://doi.org/10.1002/sce.21609.
(Science Education is a quartile-1 education research journal. 2020 ISI Impact factor = 4.593, rank 31/265 education and education research journals. Highest ranked science education research journal in 2021.)
46 citations - Google Scholar 10/14/2025
In top 22 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J19. You, H. S., Marshall, J., & **Delgado, C.** (2021). Toward interdisciplinary learning: Development and validation of an assessment for interdisciplinary understanding of global carbon cycling. *Research in Science Education 51*(5), 1197-1221. https://doi.org/10.1007/.
(RISE is a quartile-1 education research journal. 2020 impact factor = 5.439, rank 9/265)
15 citations - Google Scholar 10/14/2025
In top 30 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J20. Lucero, M., **Delgado, C.**, & Green, K.* (2020). Elucidating high school biology teachers' knowledge of students' conceptions regarding natural selection. *International Journal of Science and Mathematics Education 18,* 1041–1061. https://doi.org/10.1007/s10763-019-10008-1.
(IJSME is an ISI-indexed journal with 2020 impact factor = 2.073)

10 citations - Google Scholar 10/14/2025

J21. Jin, H., **Delgado, C.,** Bauer, M., Wylie, C., & Llort, K. (2019). A hypothetical learning progression for quantifying phenomena in science. *Science & Education, 28*(9), 1181-1208. DOI: 10.1007/s11191-019-00076-8.
(Science & Education is a Q1 ISI-indexed journal with 2019 impact factor = 1.266. Rank 12/63 in History & Philosophy of Science)
22 citations - Google Scholar 10/14/2025
In top 18 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J22. Green, K.*, Langerhans, B., Dempsey, M., & **Delgado, C**. (April/May 2018). The evolution of a partnership: How a scientist, a teacher, and a researcher brought real-world science to students. *Science Scope*. https://www.jstor.org/stable/44843340.
("Science Scope is an award-winning, peer-reviewed, practitioners' journal for grade 6–8 teachers, university faculty responsible for teacher preparation, and state and district science supervisors and leaders.")

J23. You, H. S., Marshall, J., & **Delgado, C.** (2018). Assessing students' disciplinary and interdisciplinary understanding of global carbon cycling. *Journal of Research in Science Teaching, 55*(3), 377-398. https://doi.org/10.1002/tea.21423.
(JRST is the top-ranked science education research journal. 2018 ISI impact factor = 3.135. Rank 10/263 education and education research journals. Acceptance rate: 12.5%)
65 citations - Google Scholar 10/14/2025
In top 10 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

J24. **Delgado, C.,** Jones, M. G., You, H. S., Robertson, L., Chesnutt, K.*, & Halberda, J. (2017). Scale and the evolutionarily based Approximate Number System: An exploratory study. *International Journal of Science Education 39*(8), 1008-1024. DOI: 10.1080/09500693.2017.1312626
(IJSE is an ISI-indexed education research journal with impact factor = 1.325)
7 citations - Google Scholar 10/14/2025

J25. Lucero, M., Petrosino, A., & **Delgado, C.** (2017). Exploring the relationship between secondary science teachers' subject matter knowledge and knowledge of student conceptions while teaching evolution by natural selection. *Journal of Research in Science Teaching 54*(2), 219-246. DOI: https://doi.org/10.1002/tea.21344.
(JRST is the top-ranked science education research journal. 2017 ISI impact factor = 3.210. Rank 10/236 education and education research journals. Acceptance rate: 12.5%)
55 citations - Google Scholar 10/14/2025
In top 21 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

J26. **Delgado, C.,** & Lucero, M.* (2015). Scale construction for graphing: An investigation of students' resources. *Journal of Research in Science Teaching, 52*(5), 633-658. DOI: 10.1002/tea.21205
(JRST is the top-ranked science education research journal. 2015 ISI impact factor = 3.052. Rank 6/231 education and education research journals. Acceptance rate: 12.5%)
19 citations - Google Scholar 12/18/2024
In top 31 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

J27. **Delgado, C**. (2015). Navigating tensions between conceptual and metaconceptual goals in the use of models. *Journal of Science Education and Technology 24*(2-3), 132-147. DOI: 10.1007/s10956-014-9495-7
(JOST is a top journal for technology in science education research. 2015 ISI impact factor = 1.12. Rank 23/40 "education, scientific disciplines" journals. Acceptance rate: 21%)
17 citations - Google Scholar 10/14/2025
In top 39 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

J28. **Delgado, C**., Stevens, S. Y., Shin, N., & Krajcik, J. S. (2015). A middle school instructional unit for size and scale contextualized in nanotechnology. *Nanotechnology Reviews 4*(1), 51-69. DOI: 10.1515/ntrev-2014-0023
(Nanotechnology Reviews is a quartile-2 materials science journal. 2015 ISI impact factor = 2.044.)
50 citations - Google Scholar 10/14/2025
In top 37 percentile for citations in subject area – InCites Clarivate Analytics 1/31/25

J29. **Delgado, C**. (2014). Collective landmarks for deep time: A new tool for evolution education. *Journal of Biological Education 48*(3), 133-141. DOI: 10.5408/12-300.1.
("Journal of Biological Education is firmly established as the authoritative voice in the world of biological education." 2015 ISI Impact factor = 0.507. Rank 33/40 "education, scientific disciplines" journals.)
18 citations - Google Scholar 10/14/2025

J30. Tang, K., **Delgado, C**., & Moje, E. (2014). An integrative framework for the analysis of multiple and multimodal representations for science meaning-making in science education. *Science Education 98*(2), 305-326. DOI: 10.1002/sce.21099
(Science Education is a quartile-1 science education research journal. 2013 ISI Impact factor = 2.921. Rank 8/219 education and education research journals.)
255 citations - Google Scholar 10/14/2025
In top 2 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J31. You, H. S.*, & **Delgado, C.** (2014). Toward an interdisciplinary science curriculum: Analysis of the connections across science learning progressions. *International Journal for Cross-Disciplinary Subjects in Education 4*(1), 1854-1862. DOI: 10.20533/ijcdse.2042.6364.2014.0258
(IJCDSE is a peer-reviewed, open access quarterly journal. Indexing Citation Board Impact factor = 5.214)
6 citations - Google Scholar 10/14/2025

J32. **Delgado, C**. (2013). Cross-cultural study of understanding of scale and measurement: Does the everyday use of US customary units disadvantage US students? *International Journal of Science Education 35* (8), 1277-1298. DOI: 10.1080/09500693.2013.779761.
(IJSE is a quartile-1 science education research journal. 2013 ISI Journal Citation Reports impact factor = 1.516, rank 31/ 219 education and education research journals.)
19 citations - Google Scholar 10/14/2025
In top 44 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

J33. **Delgado, C.** (2013). Navigating deep time: Landmarks for time from the Big Bang to the present. *Journal of Geoscience Education 61*(1), 103-112. DOI: 10.5408/12-300.1
("The Journal of Geoscience Education is the premier peer-reviewed publication for geoscience education research at the undergraduate and pre-college levels. JGE is the publication of record for NAGT, and serves as the only international forum for the publication of research concerning the pedagogy, assessment, and philosophy of teaching and learning about the geosciences." 2013 Scimago Impact factor 0.486)
27 citations - Google Scholar 10/14/2025

J34. Stevens, S., **Delgado, C.,** & Krajcik, J. (2010). Developing a hypothetical multi-dimensional learning progression for the nature of matter. *Journal of Research in Science Teaching 47*(6), 687-715. DOI: 10.1002/tea.20324
(JRST is the top-ranked science education research journal. 2010 ISI impact factor = 2.728. Rank 4/184 education and education research journals. Acceptance rate: 12.5%)
413 citations - Google Scholar 10/14/2025
In top 1 percent for citations in subject area – InCites Clarivate Analytics 1/31/2025

J35. Beyer, C., **Delgado, C.,** Davis, E., & Krajcik, J. (2009). Investigating teacher learning supports in high school biology curricular programs to inform the design of educative curriculum materials. *Journal of Research in Science Teaching 46*(9), 977-998. https://doi.org/10.1002/tea.20293.
(JRST is the top-ranked science education research journal. 2009 ISI impact factor = 1.910. Rank 13/139 education and education research journals. Acceptance rate: 12.5%)
160 citations - Google Scholar 10/14/2025
In top 8 percent for citations in subject area – InCites Clarivate Analytics 1/31/25

BOOK CHAPTERS, ENCYCLOPEDIA ENTRIES, AND REPORTS (5)

Ch1. **Delgado, C.,** Jones, M. G., & Parker, D. (2021). Crosscutting concept: Scale, proportion, and quantity. In J. Nordine & O. Lee (Eds)., *Crosscutting Concepts*. Arlington, VA: NSTA Press.

Ch2. **Delgado, C.** (2012). Spatial thinking and dimensionality. In K. Kastens & C. Manduca (Eds.), *Earth and mind 2: A synthesis of research on thinking and learning in the geosciences*. Special Paper 486. Boulder, CO: Geological Society of America.
3 citations - Google Scholar 10/14/2025

Ch3. **Delgado, C.** & Krajcik, J. (2010). Technology supports for science learning. In E. Baker, P. Peterson, & B. McGraw (Eds.), *The International Encyclopedia of Education* (3rd Edition). Oxford: Elsevier. DOI: 10.1016/B978-0-08-044894-7.00729-6.
21 citations - Google Scholar 10/14/2025

Ch4. Cahill, C., **Delgado, C**., & Song, M. (2010). Engaging students in content learning and scientific critique through a nanoscience context. In R. E. Yager (Ed.), *Exemplary science for resolving societal challenges*. Arlington, VA: NSTA Press.

Ch5. Beyer, **C., Delgado**, C., Davis, E. A., & Krajcik, J. S. (2006). Investigating high school biology texts as educative curriculum materials: Curriculum review process (Report).
9 citations - Google Scholar 10/14/2025

PUBLISHED PEER REVIEWED CONFERENCE PROCEEDINGS/ABSTRACTS (30)

CP1. **Delgado, C.**, Diaz, B., Trembath-Reichert, S., Keyes, E., Salako, T., Ferrell, M., & Thorpe, J. (accepted). Integrating ChatGPT into a STEM PhD course writing assignment. In *International Conference of the Learning Sciences*. Irvine, CA June 2026.

CP2. Chen, K.B.,Harper-Gampp, T., Wu, L., **Delgado**, C., & Peterson, M. (20240).Learning Scale in Virtual Reality: Experiences and Perception of Immersive Technology at a Public Middle School. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting 68*, 1, 270-275.

CP3. Cheng, F., Harper-Gampp, T., Planchart, R., Dunning, M., Peterson, M., **Delgado**, C., & Chen, K.B. (2024). Study of graphic armatures, multimodal cues, and numeric measures in virtual reality on learners' performance and workload. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting 68*, 1, 1229-1234.
1 citation - Google Scholar 9/19/2025

CP4. Díaz, B., Lynch, C., Delgado, C., Han, K. (2024). A comparative analysis of across interdisciplinary setting integration practice in educational data mining class using Community of Practice. American Society of Engineering Education (ASEE) 2024, Portland, Oregon.

CP5. **Delgado, C**., Martin, M., & Miller, T. (2024). Implementation and evaluation of impact on student learning of an automated platform to score and provide feedback on constructed-response problems in chemistry. In: Olney, A.M., Chounta, IA., Liu, Z., Santos, O.C., Bittencourt, I.I. (eds) Artificial Intelligence in Education. Posters and Late Breaking Results, Workshops and Tutorials, Industry and Innovation Tracks, Practitioners, Doctoral Consortium and Blue Sky. AIED 2024. **Communications in Computer and Information Science, 2150**. Springer. DOI: 10.1007/978-3-031-64315-6_31
1 citation - Google Scholar 9/19/2025

CP6. Planchart, R., Dunning, M., Peterson, M., Delgado, C., and B. Chen, K. (2024) Isolating and Addressing Theoretically-Grounded Limitations from the Rapid Translation of Interaction Design across Media Platforms, in Gray, C., Ciliotta Chehade, E., Hekkert, P., Forlano, L., Ciuccarelli, P., Lloyd, P. (eds.), DRS2024: Boston, 23–28 June, Boston, USA. https://doi.org/10.21606/drs.2024.1187
1 citation - Google Scholar 9/19/2025

CP7. Harper-Gampp, T., **Delgado, C**., Alharbi, K., Peterson, M., & Chen, K. B. (2024). Does shrinking and growing in VR induce awe among young students? In R. Lindgren, T. Asino, E. A. Kyza, C. Look, D. T. Keifert, & E. Suárez (Eds.). (2024). *Proceedings of the 18th International Conference of the Learning Sciences* (pp. 2447-8). International Society of the Learning Sciences. https://doi.org/10.22318/icls2024.920480

CP8. Sekelsky, B., Peterson, M., **Delgado, C**.,and Chen, K. B. (2023). Preserving theoretically-grounded functions across media platforms in interaction design. In D. Sainz Molestina, L. Galluzzo, F. Rizzo, & D. Spallazzo (Eds.), IASDR 2023: Life-changing design. International Association of Societies of Design Research. https://doi.org/10.21606/iasdr.2023.500

CP9. Díaz, B., **Delgado, C**., Han, K., Lynch, C. (2023, June). Improving graduate engineering education through Communities of Practice approach: Analysis of implementation in

computer science, robotics, and construction engineering courses. Papers on Engineering Education Repository, American Society of Engineering Education (ASEE), Baltimore, Maryland. https://peer.asee.org/43581 http://dx.doi.org/10.18260/1-2--43581
5 citations - Google Scholar 10/14/2025

CP10. Wu, L., Chen, K. B., Sekelsky, B., Peterson, M., Harper-Gampp, T., & **Delgado, C.** (2023). Shrink or grow the kids? Scale cognition in an immersive virtual environment for K-12 summer camp. In 2*023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops* (VRW) (pp. 721–722). IEEE. DOI: 10.1109/VRW58643.2023.00203

CP11. **Delgado, C**., Harper-Gampp, T., Peterson, M., & Chen, K.B. (2023). Virtual Reality induces awe but possibly not accommodation. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.). (2023). *Proceedings of the 17th International Conference of the Learning Sciences - ICLS 2023* (pp. 1050-1053). Montreal, Canada: International Society of the Learning Sciences. https://doi.org/10.22318/icls2023.115633
2 citations - Google Scholar 10/14/2025

CP12. Díaz, B., **Delgado**, C., Lynch, C., & Han, K. (2023). Using Social Network Analysis to evaluate the functioning of a class with multiple collaborating groups. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.). (2023). *Proceedings of the 17th International Conference of the Learning Sciences - ICLS 2023* (pp. 1382-1385). Montreal, Canada: International Society of the Learning Sciences.
1 citation - Google Scholar 12/18/2024

CP13. Gampp*, T., **Delgado, C.,** Peterson, M., & Chen, K. (2022). Embodied cognition in virtual reality to support learning of scale. In C. Chinn, E. Tan, C. Chan, & Y. Kali (Eds.), *ICLS Proceedings 2022, International Collaboration Toward Educational Innovation for all,* 1900-1902. https://dx.doi.org/10.22318/icls2022.1900
3 citations - Google Scholar 10/14/2025

CP14. Wu*, L., Sekelsky*, B., Peterson, M., Gampp*, T., **Delgado, C.**, & Chen, K. B. (2022, October). Immersive virtual environment for scale cognition and learning: Expert-based evaluation for balancing usability versus cognitive theories. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 66(1), 1089–1093. https://doi.org/10.1177/1071181322661094.
12 citations – Google Scholar 10/14/2025

CP15. Díaz, B., **Delgado, C**., Han, K., Lynch, C. (2022, June). Use of Communities of Practice to analyze and improve graduate engineering education. Papers on Engineering Education Repository, American Society of Engineering Education (ASEE), Minneapolis, Minnesota. https://peer.asee.org/40996 http://dx.doi.org/10.18260/1-2--40996
11 citations - Google Scholar 10/14/2025

CP16. Delgado, C., & Silver, E. A. (2020). Reconceptualizing Measurement. In Gresalfi, M. and Horn, I. S. (Eds.), *The Interdisciplinarity of the Learning Sciences, 14th International*

Conference of the Learning Sciences (ICLS) 2020, Volume 2 (pp. 693-696). Nashville, Tennessee: International Society of the Learning Sciences.
(Acceptance rate ~30%)

CP17. Yoon, S., **Delgado, C.**, McKenna, T. J., Krajcik, J. S., Levites,L. & Sussman, A. (2019). The integration of cross-cutting concepts in three-dimensional learning. In S. J. Fick, J. Nordine, J., & K. W. McElhaney, *Proceedings of the summit for examining the potential for crosscutting concepts to support three-dimensional learning*. Charlottesville, VA: University of Virginia. Retrieved from http://curry.virginia.edu/CCC-Summit.

CP18. **Delgado, C.**, & Peterson, M. (2018). An enhanced framework for scale cognition leveraging visual metaphor theory and analogical reasoning theory. 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), volume 3 (pp. 1607-8). London, UK: International Society of the Learning Sciences.
(Acceptance rate ~30%)
4 citations - Google Scholar 10/14/2025

CP19. You, H.-S.* & **Delgado, C**. (2014). Weaving an interdisciplinary science curriculum: Analysis of the connections across learning progressions. In C. A. Shoniregun & G. A. Akmayeva (Eds.), *Canada International Conference on Education Conference Proceedings* (pp. 68-71). Basildon, UK: CICE.

CP20. **Delgado, C**., & Lucero, M.* (2014). Students' resources for the construction of scales for graphing. In J. L. Polman, E. A. Kyza, D. K. O'Neill, I. Tabak, W. R. Penuel, A. S. Jurow, K. O'Connor, T. Lee, & L. D'Amico (Eds.), *Learning and becoming in practice: Proceedings of the International Conference of the Learning Sciences (ICLS)*, volume 1 (pp. 262-269). Boulder, CO: International Society of the Learning Sciences.
(Acceptance rate ~30%)

CP21. **Delgado, C.,** & Morton, K.* (2012). Learning progressions, learning trajectories, and equity. In van Aalst, J., Thompson, K., Jacobson, M. J., & Reimann, P. (Eds.) (2012). The future of learning: *Proceedings of the 10th International Conference of the Learning Sciences (ICLS 2012) – Volume 1, Full papers*, pp. 204-211. International Society of the Learning Sciences: Sydney, NSW, Australia.
((Acceptance rate ~30%)
6 citations - Google Scholar 10/14/2025

CP22. **Delgado, C.** (2010). Units of length: A notational system for conceptual understanding of size and scale. In K. Gomez, L. Lyons, & J. Radinsky (Eds.), *Learning in the disciplines: Proceedings of the 9th International Conference of the Learning Sciences (ICLS)*. Vol. 2. pp. 362-363. Chicago: International Society of the Learning Sciences.
(Acceptance rate ~30%)
9 citations - Google Scholar 10/14/2025

CP23. Stevens, S., Krajcik, J., Shin, N., …, **Delgado, C.,** et al. (2008). Using Construct-Centered Design to align curriculum, instruction, and assessment development in emerging science. In G. Kanselaar, V. Jonker, P.A. Kirschner, & F. Prins, (Eds.).

Proceedings from ICLS '08: *International perspectives in the Learning Sciences: Creating a learning world* (vol. 3, pp. 314-21). Utrecht, the Netherlands: International Society of the Learning Sciences.
16 citations - Google Scholar 10/14/2025

CP24. Cahill, C., Stevens, S., Shin, N., **Delgado, C.**, Krajcik, J., & Yunker, M., (2007). Using small-group discussions to assess student learning of nanoscale concepts. *Abstracts of Papers of the American Chemical Society 233,* 639-639.

CP25. Shin, N., Quintana, C., **Delgado, C.**, Stevens, S., & Krajcik, J. (2007). The nanoworld: Research-driven design process. *Abstracts of Papers of the American Chemical Society 233,* 657-657.

CP26. Stevens, S., Krajcik, J., **Delgado, C.**, Elgammal, R., Quintana, C., Rosenquist, A., … & Yunker, M. (2007). Identification of the big ideas in nanoscience. *Abstracts of Papers of the American Chemical Society 233,* 678

CP27. Delgado, C., Stevens, S., & Krajcik, J. (2007). Size and scale curricular activities for middle school. *Abstracts of Papers of the American Chemical Society 233,* 674-674

CP28. Delgado, C., Stevens, S., & Krajcik, J. (2007). Students' conceptions of size. *Abstracts of Papers of the American Chemical Society 233,* 666-666.

CP29. Hutchinson, K., Stevens, S., Shin, N., **Delgado, C.**, Yunker, M., Bodner, G., Giordano, N., & Krajcik, J. (2007). Secondary students' interests in nanoscience concepts and phenomena. *Abstracts of Papers of the American Chemical Society 233,* 761-731.
2 citations - Google Scholar 12/18/2024

CP30. Stevens, S., **Delgado, C.**, Shin, N., & Krajcik, J. (2007). Developing and validating a learning progression for the nature of matter. *Abstracts of Papers of the American Chemical Society 233,* 661-661.
2 citations - Google Scholar 12/18/2024

PUBLICATIONS IN *MEXICAN JOURNALS* (4)

MX1. Delgado, C. (2002). Dinámica de grupos e identificación proyectiva en el contexto escolar (Group dynamics and projective identification in the school context). *Revista Mexicana de Pedagogía 13*(66), 3-9, *13*(67), 19-23.
Revista Mexicana de Pedagogía publishes theoretical papers, position papers, and analyses. It is aimed at education policy makers.

MX2. Castro, M., **Delgado, C.,** & Signoret, A. (2000-2001). Los cuentos de hadas en la pedagogía nacional (Fairy tales in Mexican pedagogy). *Revista Mexicana de Pedagogía 11*(55), 26-31, *12*(56), 20-24, *12*(57), 15-21.
Revista Mexicana de Pedagogía publishes theoretical papers, position papers, and analyses. It is aimed at education policy makers.

MX3. Delgado, C. (1999). Un ejercicio constructivista en química (A constructivist exercise in chemistry). *Correo del Maestro 4*(40), 5-9.

Correo del Maestro is a practitioner journal for all school subjects.

MX4. Delgado, C. (1999). Cómo fomentar el pensamiento abstracto en clase de matemáticas (Encouraging abstract thought in mathematics class). *Correo del Maestro 3*(34), 5-7.
Correo del Maestro is a practitioner journal for all school subjects.

MANUSCRIPTS IN REVIEW/IN PREPARATION (4)

IP1. Peterson, M., Delgado, C., Planchart, R., Kulasingam, R., Wu, L., Harper-Gampp, T., Mathenge, R., Cheng, F., Sekelsky, B., Anderson, A. L., & Chen, K. B. (under review). Function mapping: Guidance for multidisciplinary teams in making theoretically grounded design decisions in the development of interactive systems. Submitted to *Information Design Journal*.

IP2. Cheng, F., Harper-Gampp, T., Planchart, R., Dunning, M., Hilligoss, Q. Peterson, M., **Delgado,** C., & Chen, K.B. (under review). Effects of virtual reality and cueing elements on performance, workload, and visual behavior in scale cognition. *Human Factors : The Journal of the Human Factors and Ergonomics Society.*

IP3. Harper-Gampp, T., **Delgado, C.,** Mathenge, R., **.**, et al. (in preparation). Development and evaluation of an energy curriculum for middle school using VR.

IP4. Díaz, B., **Delgado, C**., Han, K., Lynch, C., Celis, S. (draft completed). Elucidating Community of Practice within formal education settings: A multi-case study. Target journal: *Educational Psychologist.*

PRESENTATIONS AT PROFESSIONAL MEETINGS WITHOUT PROCEEDINGS OR ABSTRACTS (77)

* Co-author was a graduate student working under my supervision at the time of submission
^ Co-author was an undergraduate student of mine at the time of submission

C1. Trembath-Reichert, S.*, **Delgado, C.**, & Diaz, B. (2026, April). Applying the PCK framework to educators' analysis of AI-generated stem problems. Paper presented at the National Association of Research in Science Teaching (NARST) Conference, Seattle, WA.

C2. Harper-Gampp, T., **Delgado, C**., Alharbi, K., Peterson, M. & Chen, K. B.. (2025, March). Unveiling the causes of awe in VR among college students. Paper presented at NARST. March 2025, National Harbor, MD , United States.

C3. Mathenge, R.*, **Delgado, C**. Peterson, M. & Chen, K. (2025, February). Impact of immersive virtual reality learning environments on students' conceptualization of the structure and scale of the atom. Paper presented at the Annual Conference of the American Association of College Teachers Educators (AACTE), Long Beach, CA

C4. Estrada, E., Harper-Gampp, T*., **Delgado, C.**, Mathenge, R*., Peterson, M., Chen, K. B., & Wu, L. (2024, March). Co-designing a science lesson with VR in middle school

science. In Leveraging embodied cognition using virtual reality in middle school science education [Related paper set]. NARST 2024, Denver, CO, United States.
(NARST formerly stood for National Association for Research in Science Teaching and is the premier science education research conference in the world. NARST is now an international organization.)

C5. **Delgado, C.**, Harper-Gampp, T.*, Mathenge, R.*, Peterson, M., & Chen, K. B. (2024, March). Impact of VR science lesson on students' knowledge of scale. In Leveraging embodied cognition using virtual reality in middle school science education [Related paper set]. NARST 2024, Denver, CO, United States.

C6. Harper-Gampp, T.*, **Delgado, C.**, Peterson, M., Chen, K. B., Mathenge, R.*, Planchart, R., & Kulasingam, R. (2024, March). Student impressions about a VR science lesson. In Leveraging embodied cognition using virtual reality in middle school science education [Related paper set]. NARST 2024, Denver, CO, United States.

C7. Mathenge, R.*, Kulasingam, R., Harper-Gampp, T.*, **Delgado, C**., Peterson, M., & Chen, K. B. (2024, March). Impact of an VR science lesson on reformed-oriented nature of science instruction. In Leveraging embodied cognition using virtual reality in middle school science education [Related paper set]. NARST 2024, Denver, CO, United States.

C8. Harper-Gampp, T.*, **Delgado, C**., Peterson, M., Chen, K. B., Mathenge, R.*, Planchart, R., Kulasingam, R., & Wu, L. (2024, April). Scale reasoning in immersive virtual reality: Capturing middle school students' learning [Symposium presentation]. American Educational Research Association 2024, Philadelphia, PA, United States.
(AERA is the largest gathering of scholars in the education research field with approximately 14,000 participants)

C9. Wu, L., Sekelsky, B., Peterson, M., Gampp, T.*, **Delgado, C**., & Chen, K. B. (2023, October). Scale Worlds: Iterative refinement, evaluation, and theory-usability balance of an immersive virtual learning environment (poster). Human Factors and Ergonomics Society 2023.
2 citations - Google Scholar 10/14/2025

C10. Diaz*, B., **Delgado, C**., Han, K., & Lynch, C. (2023, June). Improving graduate engineering education through Communities of Practice approach: Analysis of implementation in computer science, robotics, and construction engineering courses. Paper presented at ASEE 2023.
("The purpose of ASEE is the advancement of education in all of its functions which pertain to engineering and allied branches of science and technology, including the processes of teaching and learning, counseling, research, extension services and public relations..")
1 citation - Google Scholar 12/18/2024

C11. Harper-Gampp*, T., **Delgado, C**., Peterson, M.O., & Chen, K.B. (2023, April). *Refining a panel of experts validation methodology for instrument development.* Presented at AERA 2023, Chicago, IL.

C12. **Delgado, C.**, & Alexander, A. (2023, March). *A historical analysis of the standards for graph construction in the US*. Presented at NARST 2023, Chicago, IL.

C13. Harper-Gampp*, T., **Delgado, C**., Peterson, M.O., & Chen, K.B. (2023, March). *Designing and developing an instrument to assess scale cognition.* Presented at NARST 2023, Chicago, IL.

C14. Wright, G. W., III, & **Delgado, C.** (2023, March). *Exploring changes in pre-service science teachers' attitudes and beliefs about gender & sexual diversity-inclusive science teaching.* Presented at NARST 2023, Chicago, IL

C15. Díaz*, B. Delgado, C., Han, K., & Lynch, C. (2022, June) . *Use of Communities of Practice to analyze and improve graduate engineering education*. Paper presented at ASEE Annual Conference & Exposition, Minneapolis, Minnesota.

C16. Díaz*, B. Delgado, C., & Han, K. (2022, June). *BIM: A bridge to promote industry-academic partnership in construction engineering*. Paper presented at ASEE Annual Conference & Exposition, Minneapolis, Minnesota.
3 citations - Google Scholar 10/14/2025

C17. **Delgado, C.**, Green, K., & Webster*, M. (2021, April). *Trajectories of adoption and abandonment after professional development in project-based learning.* Paper presented at NARST 2022 (Vancouver, Canada, and online).

C18. Rende*, K., Jones, M.G., Nieuwsma*, J., Carrier, S., **Delgado, C**., Grifenhagen, J., Gordon, K., Refvem*, E., & Huff*, P. (2021, August). *Evoking awe: Incorporating epistemic emotions in science instruction.* Paper presented at European Science Education Research Association (ESERA). Braga, Portugal (Online)
(ESERA is the leading European science education research conference)

C19. Nieuwsma*, J., Jones, M. G., Rende*, K., Refvem*, E., Carrier, S., **Delgado, C**., Grifenhagen, J. (2021, August). *Gasps and chills: Teachers' perceptions of awe in science instruction*. Paper presented at ESERA. Braga, Portugal (Online)

C20. You, H. S., Park, S., & **Delgado, C**. (2021, April). *A closer look at U.S. schools: What school characteristics are associated with scientific literacy? A multivariate multilevel analysis using PISA 2015*. Paper presented at AERA (Online).

C21. You, H. S., **Delgado, C**., & DeAtley, K. (2021, April), *Experts' model-based reasoning and interdisciplinary understanding about carbon cycling*, Paper presented at AERA (online).

C22. Nieuwsma*, J., Jones, M. G., Rende*, K., Refvem*, E., Carrier, S. J., Grifenhagen, J. F., **Delgado, C**., & Huff*, P. (2021, April). *Teachers' sense of awe: A tool for teaching science*. Paper presented at AERA (online).

C23. **Delgado, C.**, You, H. S., Murillo-Quirós, N., & Hernández-Campos, M. (2021, April). *Analysis of the Spanish-language Force Concept Inventory: Lost in translation?* Paper presented at NARST 2021 (Online).

C24. **Delgado, C.**, & Wright*, G. (2021, April). *Consistency and contradiction.* Paper presented at NARST 2021 (Online).

C25. Nieuwsma*, J., Jones, M. G., Rende*, K., Carrier, S., Grifenhagen, J., **Delgado, C.** & Huff*, P. (2021, April). *Evoking meaning and connection: Using awe to teach science*. Paper presented at NARST 2021 (Online).

C26. Smith*, C., & **Delgado, C.** (2020, March). *Exploring sources of and changes in graduate teaching assistant teacher efficacy throughout a semester.* NARST, 2020, Portland, OR. [Conference cancelled].

C27. Green*, K., & **Delgado, C**. (2020, March). *Moving between contexts: A pedagogical intervention's effects on community college biology students*. NARST, 2020, Portland, OR. [Conference cancelled].

C28. **Delgado, C**., Green*, K., & Foster, B. (2020, March). *Generating a comprehensive, context-sensitive framework for evolution cognition*. NARST, 2020, Portland, OR. [Conference cancelled].

C29. You, H., **Delgado, C**. & Park, S. (2020, April) *Exploring differential school effects between low- and high-ability groups on scientific literacy* [Poster Session]. AERA San Francisco, CA. http://tinyurl.com/vqe9w6w [Conference Canceled]

C30. **Delgado, C.** (2019, August). *Students' views on the "categorical imperative" of avoiding contradiction*. Paper presented at ESERA. Bologna, Italy.

C31. Green, K.*, & **Delgado, C.** (2019, August). *Navigating cultural borders: An evolution intervention in an undergraduate biology class*. Paper presented at ESERA. Bologna, Italy.

C32. You, H. S., Park, S., & **Delgado, C.** (2019, April). *What school-level factors influence scientific literacy? A multi-level analysis using PISA 2015*. Paper presented at AERA. Toronto, Canada.

C33. Green, K.*, & **Delgado, C.** (2019, April). *Synthesizing frameworks of evolution learners: A promising new direction*. Paper presented at AERA. Toronto, Canada.

C34. **Delgado, C.,** Peterson, M., Norville, K.*, & Bordas, C.* (2019, April). *Interpretational functions of imagery in instructional media for science education.* Paper presented at NARST. Baltimore, MD.

C35. Jin, H., **Delgado, C.**, Bauer, M., Wylie, E. C., Llort, K. F., & Cisterna, D. (2019, April). *Bases for developing a hypothetical learning progression for quantification in science***.** Paper presented at NARST. Baltimore, MD.

C36. Smith, C. R.***,** & **Delgado, C.** (2019, April). *Applying a K-12 consensus model to science teaching assistant professional development.* Paper presented at NARST. Baltimore, MD.

C37. **Delgado, C.,** Norville, K.*, Han, K., Lobaton, E., & Wu, T. (2019, March). *Assessing the effectiveness of individual learning in a realistic engineering design class.* Paper presented at ASEE, Southeast Conference. Raleigh, NC.

C38. **Delgado, C.** (2019, March). *Integrating science, mathematics, and technology through project-based learning* (90-min workshop). Paper presented at the International Consortium for Research in Science and Mathematics**.** San José, Costa Rica.
(ICRSME fosters the advancement of science and mathematics education in developing countries, focusing on "programs for collaborative research, curriculum development, instructional improvement, academic exchange, teacher education and professional development, innovation initiatives, and shared resource opportunities.")

C39. **Delgado, C.**, & You, H. S. (2018, April). *Interdisciplinary connections in the NGSS: Realizing the vision*. Paper presented at AERA. New York, NY.

C40. **NARST.** You, H.S., **Delgado, C.,** & Marshall, J. (2018, March). *Assessing students' disciplinary and interdisciplinary understanding of global carbon cycling*. Paper presented at NARST, Atlanta, GA.

C41. Green, K.*, & **Delgado, C.** (2018, March). *A novel model for professional development in project-based learning, evaluated*. Paper presented at NARST, Atlanta, GA.

C42. Lucero, M., Green, K.*, & **Delgado, C.** (2018, March). *An exploration of high school biology teachers' knowledge about students' natural selection ideas.* Paper presented at NARST, Atlanta, GA.

C43. Green, K.*, & **Delgado, C**. (2018, January). *Teleological alternative conceptions about evolution in pre-service and in-service science teachers.* Paper presented at Association for Science Teacher Education (ASTE), Baltimore, MD.
(ASTE strives to be the leading voice in the areas of research and policy development related to the enhancement of science teaching.)

C44. Aksit, O.*, **Delgado, C.,** & Green, K.* (2017, April). *Undergraduates' knowledge of age of events and duration of processes in geoscience*. Paper presented at AERA, San Antonio, TX.

C45. **Delgado, C.** (organizer, presenter), Anderson, D., Green, K.*, Lucero, M., Nason, M., Sutherland, S. (discussant). (2017, April). *New directions and longstanding issues in assessment of evolutionary knowledge*. Symposium held at NARST, San Antonio, TX.

C46. You, H. S., Marshall, J., & **Delgado, C.** (2017, April). *Toward interdisciplinary science learning: Development of an assessment for interdisciplinary understanding of carbon cycling*. Paper presented at NARST 2017.

C47. **Delgado, C.**, & Aksit, O.* (2016, October). *Building blocks for understanding conversion factors and stoichiometry*. 60-min workshop held at North Carolina Science Teachers Association Professional Development Institute, Greensboro, NC.
("Each year, NCSTA's PDI provides sessions by science educators from North Carolina and the Southeast, demonstrating creative and proven methods to present content and pedagogy in science.")

C48. **Delgado, C.,** & Lucero, M. (2016, April). *Following and breaking conventions for scales on graphs: From middle school students to university professors*. Paper presented at NARST, Baltimore, MD.

C49. Mann, M.*, **Delgado, C.,** Petrosino, A., Stroup, W. (2015, April). *Tensions between conceptual and metaconceptual learning with models*. Paper presented at NARST, April 2015, Chicago.

C50. You, H., S.*, & **Delgado, C.** (2015, April). *Revisiting the Coleman report: Exploring school effects on scientific literacy in PISA 2012 using hierarchical linear modeling*. Paper presented at NARST, April 2015, Chicago.

C51. Chiu, J., Cui, L., Czerniak, C. (discussant), **Delgado, C.**, Hazari, Z., Klotz, L., Liu, X., Nguyen, D.-H., Potvin, G., Rebello, S., Sadler, P., Scott, T., Shen, J. (chair), Smith, E., Sonnert, G., Sung, S., You*, H. S., Zhang, D. (2015, April). *Interdisciplinary and integrated STEM education: Research, practices, and perspectives*. Symposium held at AERA, Chicago, IL.

C52. Lucero, M., **Delgado, C.**, & Petrosino, A. (2014, April). *Measuring science teachers' pedagogical content knowledge for student ideas about natural selection using a concept inventory*. Paper presented at AERA, Philadelphia, PA.

C53. **Delgado, C.**, & Ledbetter, N.^ (2014, April). *Cluster analysis as a tool for qualitative research: The case of scale construction*. Paper presented at AERA, Philadelphia, PA.

C54. Anderson, C., Bembenic, M., **Delgado, C.**, Flarend, A., Kastens, K., McDonald, S., Plummer, J., Pickard, M., Rivet, A., & Rubin, K. A. (2014, March). *Integrating crosscutting themes, practices, and core ideas: Learning progressions in Earth and space sciences*. Symposium held at NARST, Pittsburgh, PA.

C55. You, H. S.*, & **Delgado, C.** (2014, June). *Weaving an interdisciplinary science curriculum: Analysis of the connections across learning progressions*. Paper presented at Canada International Conference on Education, Nova Scotia, Canada.
("The CICE is an international refereed conference dedicated to the advancement of the theory and practices in education.")

C56. **Delgado, C.** (2013, April). *Nature of science considerations in the design and use of simulations for chemistry*. Paper presented at AERA, San Francisco, CA.

C57. Ko, P.*, & **Delgado, C.** (2013, April). *A proposal for a hypothetical K-12 learning progression set for algorithmic thinking*. Paper presented at AERA, San Francisco, California.

C58. **Delgado, C.,** Jones, G., You, H. S.*, Robertson, L, & Halberda, J. (2013, April). *Size and scale tasks and their relation to evolutionarily-based and culturally-based knowledge*. Paper presented at NARST, Rio Grande, Puerto Rico.

C59. Craig, T.*, & **Delgado, C.** (2013, April). *Aligning science learning progressions and the Common Core State Standards for Mathematics*. Paper presented at NARST, Rio Grande, Puerto Rico.

C60. **Delgado, C**., & Delgado, R. (2013, January). *Exploring the use of physics analogies in legal storytelling.* Paper presented at Association of American Law Schools meeting. New Orleans, LA.
(The AALS meeting gathers "thousands of law faculty, deans, administrators and scholars… [to] discuss critical and emerging legal issues")

C61. Lucero, M.*, & **Delgado, C.** (March, 2012). *Understanding the conventions undergraduate students follow or break when constructing scales for graphs.* Paper presented at NARST, Indianapolis, IN.

C62. **Delgado, C.**, & You, H. S.* (2012, March). *Learners' strategies for size estimation*. Paper presented at NARST, Indianapolis, IN.

C63. **Delgado, C.** (2011, April). *Navigating deep time: Landmarks from the Big Bang to the present*. Paper presented at NARST, Orlando, FL.

C64. **Delgado, C**. (2011, April). *Cross-cultural comparison of SI-native and Imperial-native students' understanding of size and scale.* Paper presented at NARST, Orlando, FL.

C65. **Delgado, C**., & Lucero, M.* (2011, April). *Why do students construct unconventional scales for graphs?* Paper presented at AERA, New Orleans, LA.

C66. **Delgado, C.** (2010, April). *Theoretical and empirical investigation of students' strategies for size estimation*. Paper presented at National Council of Teachers of Mathematics Research Presession, San Diego, CA.
(The NCTM Research Pre-Session gathers "leading mathematics education researchers …to examine and discuss current issues in mathematics education.")

C67. **Delgado, C**. (2010, March). *Knowledge of scale construction for graphing in undergraduate students*. Paper presented at NARST, Philadelphia, PA.

C68. **Delgado, C**. (2009, April). *Learning progressions as a tool for equity*. Paper presented at NARST, Garden Grove, CA.

C69. **Delgado, C**., Short, H., & Krajcik, J. (2009, April). *Design, implementation, and evaluation of the effectiveness of a 12-hour middle school instructional unit for size and scale*. Paper presented at NARST, Garden Grove, CA.
3 citations - Google Scholar 10/14/2025

C70. Adams, J., Cofford, G., **Delgado, C.**, Kang, A., Ryoo, K., Preston, S., & Buck, G. (discussant). (2009, April). *Exploring the grand challenges and great opportunities in realizing a more equitable science education*. Symposium held at NARST, Garden Grove, CA.

C71. **Delgado, C.**, Stevens, S., & Shin, N. (2008, April). *Development of a learning progression for students' conceptions of size and scale*. Paper presented at NARST, Baltimore, MD.
7 citations - Google Scholar 12/18/2024

C72. Hutchinson, K., Stevens, S., Shin, N., Yunker, M., **Delgado, C…**, Krajcik, J. S. (2007, June). *Secondary students' beliefs about their interests in nanoscale science and engineering.* Paper presented at ASEE, Honolulu, HI.
2 citations - Google Scholar 12/08/2022

C73. **Delgado, C.,** Stevens, S., & Shin, N., Yunker, M., Krajcik, J. (2007, April). *The development of students' conception of size.* Paper presented at NARST, New Orleans, LA.
35 citations - Google Scholar 12/18/2024

C74. Stevens, S., Shin, N., **Delgado, C.**, Cahill, C., & Yunker, M. (2007, April). *Fostering students' understanding of interdisciplinary science in a summer science camp*. Paper presented at NARST, New Orleans, LA.
13 citations - Google Scholar 10/14/2025

C75. Shin, N., Stevens, S., **Delgado, C.**, Krajcik, J., & Pellegrino, J. (2007, April). *Using learning progressions to inform curriculum, instruction, and assessment design*. Paper presented at NARST, New Orleans, LA.
31 citations - Google Scholar 10/14/2025

C76. Beyer, C., **Delgado, C.**, & Davis, E. (2007, April). *Investigating teacher learning supports in high school biology textbooks to inform the design of educative curriculum materials*. Paper presented at NARST, New Orleans, LA.

C77. Stevens, S., **Delgado, C.**, Krajcik, J., Pellegrino, J. (2007, April). *Developing a learning progression for the nature of matter*. Paper presented at AERA, Chicago, IL.
22 citations - Google Scholar 10/14/2025

OTHER SCHOLARLY ACTIVITIES

Curriculum development.

Size and scale of submacroscopic objects. An interdisciplinary, project-based 12-hour unit for middle school. 2007-2009

UTeach Institute Project-Based Instruction Replication Materials (with Denise Ekberg)
Developed the instructional materials, syllabus, multimedia presentations, etc. for the course Project-Based Instruction. This course is taught in 45 universities in 21 states and the District of Columbia. Close to 7000 students are currently enrolled in UTeach programs leading to teacher licensure. 2015

Software development.

Size and Scale. An interactive simulation that allows students to visualize the relative scale of important scientific objects including cells and atoms, and to calculate their absolute size from relative scale and known absolute size of the reference object – a pinhead. With partners from UIC, UIUC. 2009

Ten powers of ten. Interactive computer visualization for the size of objects, covering ten orders of magnitude (from football field to virus), using *Stallion*, the world's largest tiled-display system (at the ACES Visualization Laboratory, UT Austin)
2008

INTERNATIONAL SERVICE

Journal of Research in Science Teaching
Editorial Board 2018-2022
Associate Editor 2022-2025

International Journal of Science Education Editorial Board 2022-

NARST
Strand Coordinator, Strand 1 2017-2019
Strand 11 2019-2021
Faculty Mentor for Graduate Research Symposium 2019
Publication Advisory Committee, Member, (appointed) 2022-25
Research Worth Reading Subcommittee Chair 2024-25
Research Committee, Member, co-chair Publications Subcommittee 2025-26
NanoHUB Education Advisory Committee 2013-2022
NanoHUB is a resource for nanoscience and nanotechnology, created by the NSF-funded Network for Computational Nanotechnology. NanoHUB has over 300,000 users annually, worldwide.

Peer reviewer for journals (107 peer review records of 86 manuscripts)
Journal of Research in Science Teaching (69 reviews)
International Journal of Science Education (19 reviews)
Journal of Science Education and Technology (4 reviews)
Science Education (2 reviews)
Developmental Psychology (2 reviews)
Review of Educational Research (2 reviews)
Physical Review Physics Education Research

Eurasia Journal of Mathematics, Science and Technology Education
Mathematical Thinking and Learning
International Journal of Human-Computer Interaction
Journal of Engineering Education
Cognitive Processing
The Elementary School Journal
Journal of Cognition and Development
Journal of Nano Education

Peer reviewer for books

Alonzo, A.C., & Gotwals, A. W. (Eds.)(2012). *Learning progressions in Science: Current challenges and future directions*. (1 chapter)

C. Manduca & K. Kastens (Eds.)(2012). *Earth and mind 2.* GSA Special Papers. (1 chapter)

A. Rogat (Ed.). (2011) *Hypothetical Learning Progressions to Support New Science Standards: A Resource for Science Supervisors.* Consortium for Policy Research in Education. (Whole book)

Peer reviewer for conferences 2007-

National Association for Research in Science Teaching-NARST
(2007, 2008, 2011, 2012, 2013, 2016, 2019, 2022)
American Educational Research Association
(2010, 2011)
International Conference of the Learning Sciences
(2014, 2016; senior reviewer 2023, 2025, 2026)

NATIONAL SERVICE

Ad hoc reviewer, NSF EPSCOR 2025

Reviewer, Spencer Foundation Large Grant 2024

Advisory Board Member 2016-19
Promoting STEM Interests and Careers through FAME (Families and Museums Exploring), PI: Gail Jones

Developer, Presenter

UTeach Institute Knowing and Learning Course Overview 2014
Austin, TX; to approximately 30 instructors from universities across the country replicating UTeach

UTeach Institute Project-Based Instruction Workshop 2010, 2012
Austin, TX; to approximately 25 instructors each time

UTeach Institute Project-Based Instruction Course Overview 2011, 2012
Austin, TX; to approximately 25 instructors each time

Invited Participant 2010
Designing Technology-Enabled Diagnostic Assessments for K-12 Mathematics Conference. Raleigh, NC.

Invited Reviewer for National Science Foundation (NSF) 2009

Invited Reviewer for National Science Foundation (NSF), IGE 2022

Invited presentation: National Science Foundation ECR PI Meeting 2024
May 28–30, 2024. Panel: "New Directions for Spatial Thinking in STEM Learning Research" Ariel Starr, Cesar **Delgado**, Peggy McNeal, and David Uttal (Moderator)

UNIVERSITY SERVICE

North Carolina State University

Dissertation committee for Carla Delcambre, Dept. of Design, NCSU 2024

STEM Education department head search committee 2023

Dissertation committee for Linfeng Wu, Dept. of Computer Science, NCSU 2023-24

University Research Committee 2022-

Dissertation committee for Yiqiao Xu, Dept. of Computer Science, NCSU 2021-22

Invited talk at Newly Tenured Faculty Celebration lunch 2019

Distance Education Program Directors and Coordinators Committee 2019-2022

Judge, Latin American Research Symposium 2016-18

University of Texas at Austin

Academic Integrity and Information Technology Committee 2012-2014

Educational Policy Committee 2010-2014

Course and Instructor Survey Ad Hoc Sub-Committee, Education Policy Committee 2011-2012

UTeach Steering Committee 2010-2015

Research and Policy Ad Hoc Sub-Committee, UTeach Steering Committee 2010-2012

COLLEGE AND DEPARTMENT SERVICE

Computer Science Education search committee, chair	2025-26
AI in K-12 Education Working Group	2024-
College of Education Research Committee	2018-
Catalyst Grant Review Committee	2025
Ad hoc Committee on Technological and Managerial Innovation in the SFR	2023
Search Committee for the Dean, College of Education	2021
Search Committee for the Director of the Transformational Scholars program	2021
Awards Committee	2021-23
FAR Feedback Panel for Tenure-Track Assistant Professors	2021
Search Committee for the Associate Dean for Faculty and Academic Affairs	2019
Search Committee for the Associate Dean for Research and Innovation	2019
Ad hoc liaison to CIAE (Chile Education Research Center)	2019-2020
Leadership Institute for Future Teachers Advisory Board	2019-20
Distance Education and Remote Learning Task Force	2019-22
CATALYST grant review committee	2019
Research Committee for the College of Education Co-chair	2018- 2019-2020
Search Committee, Associate Dean of Faculty and Academic Affairs	2018
Search Committee, Assistant Professor for Mathematics Education	2017
Guest lecture, ECI 709 Learning Sciences Seminar	2017, April
Member, CED Committee for Excellence Awards	2017
Computer & Technology Committee	2016-2018
NSF Graduate Research Fellowship Program review panel	2015

Science Education Program Scheduling head 2015-2021

University of Texas at Austin
Committee on graduate student awards and fellowships 2014-2015

Committee for Dean's Fellowship award 2014-2015

Second-year doctoral student review committee – STEM 2013

Standing Committee on Programs and Courses 2012-2014

Elementary Mathematics Education Search Committee 2012
Engineering Education Faculty Search Committees 2013

Recruitment Initiative for Hispanic Students, College of Education 2012

Ad Hoc Nominating Committee of the C&I GSC 2011-2012

Graduate Studies Committee - Curriculum and Instruction 2009-2015

Graduate Studies Committee Science and Math Education
Member 2009-2015
Secretary 2012-2015

OUTREACH AND EXTENSION

Presenter, *Scale Worlds VR.* STEM Day, Wake Tech Community College 2025

Presenter, *Scale Worlds TVL.* State of the Sciences. NCSU 2025

Presenter, *Scale Worlds VR,* NCDPI AIM conference research showcase 2024

Presenter, *Scale Worlds VR.* Dia de la Ciencia, NC Museum of Natural Sciences 2024

Presenter, *International Consortium for Research in Science and Mathematics Education* XV
90- minute Workshop on Project-Based Learning
San Jose, Costa Rica 2019

Invited Presenter, *Crosscutting Concept Summit* (Funded by NSF), Arlington VA 2018

Ad hoc liaison to North Carolina Society of Hispanic Professionals 2018-

Presenter, *Project-Based Learning: Does it work? Why? What does it look like?* 2018
60-minute talk for WCPSS's SummerSTEM Professional Development Workshop

Exhibiter 2018

Triangle High Five Math/Science Summit. 60-minute session: Quantification in Science: How Does Math Play Out in Science?

Exhibit Developer and Presenter 2017, 2018

Celebremos la Ciencia (Let's Celebrate Science), Museum of Life and Science, Durham NC. Engaged approximately 100 people of all ages in construction and understanding of electrical circuits (2017); approximately 100 people in learning about pH in foods (2018)

Panelist 2017

Brothers United in Leadership Development. NCSU. Outreach and recruitment event for 100 male high school students of color.

Exhibit Presenter 2016, 2017

NanoDays. NCSU. Engaged approximately 70 secondary public school students in exhibits demonstrating and explaining nanoscience and nanotechnology principles and applications.

Workshop Presenter (with Aksit, O.*) 2016

Building blocks for understanding conversion factors and stoichiometry.
60-min workshop and presentation at North Carolina Science Teachers Association Professional Development Institute, October 2016, Greensboro, NC. Led approximately 40 teachers through instructional activities to build conceptual understanding of conversion factors, indirectly impacting around 4000 North Carolina students.

Designer and Implementer of Curriculum 2007-2009

Summer Nanoscience Academy. University of Michigan, Ann Arbor. Lead role in the design and implementation of a two-week, full day summer camp for approximately 35 underprivileged (>50% free or reduced lunch school district), racially diverse middle school students each year, using nanoscale science and technology as a context to teach important content and inquiry skills.

TEACHING AND MENTORING

= I developed the course
% = I substantively revised the course
^{QM} = Online course revised to conform with *Quality Matters* guidelines and submitted for review and certification

Undergraduate courses

University of Texas at Austin:
EDC 365C$^{\%}$ Knowing and Learning in Math and Science
EDC 365D Classroom Interactions
EDC 365E$^{\%}$ Project Based Instruction

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North Carolina State University
EMS 375 Methods of Teaching Science I

Graduate courses

Masters - North Carolina State University
EMS 505 Methods of Science Teaching 1
EMS 531[%] Introduction to Research in Science Education
EMS 594[#] Advanced Teaching in Physical Sciences
EMS 573[%] Technology Tools for Science Teachers
EMS 573[#] Design of Tools and Learning Environments in STEM (with H.S. Lee and E. Krupa)
EMS 573[QM%] Design of Tools and Learning Environments in STEM

Doctoral - North Carolina State University
EMS 731 Fundamentals of Research in Science Education: Qual. and Quant. Inquiry
EMS 732[%] Theoretical and Critical Perspectives of Science Education
EMS 792[#] Learning Theories in STEM (developed with Jere Confrey)
ED 795[%] Learning Sciences: Theories, Concepts, and Environments (NCSU)

Doctoral – University of Texas at Austin
EDC 385G[#]: Advanced Topics - Learning Progressions and Learning Trajectories in Science and Mathematics Education
EDC 390T[%]: Equity in Science and Mathematics Education

Doctoral Committees

Completed - University of Texas at Austin
Hye Sun You, Science Education (chair 2011-2014; member 2015)
Graduated 2016. Currently assistant professor Arkansas Tech U.
Margaret Lucero, Science Education (member)
Graduated 2014. Currently assistant professor at Santa Clara University
Tina Vega, Mathematics Education (chair)
Graduated 2015. Currently math teacher at Lee High School, San Antonio, TX
Soon Wook Han, Science Education (member)
Graduated 2013. Currently science teacher at MacArthur High School, Irving, TX

Completed – NCSU
Ruth Mathenge, Science Education (chair, 2021-2025)
Brayan Diaz, Science Education (chair, 2021-2024)
Tyler Harper-Gampp, Science Education (chair, 2021-2024)
Gary Wright, Science Education (chair, 2016-2022).
Kathryn Green, Science Education (chair, 2015-19)
Cody Smith, Science Education (chair, 2016-19)

Alonzo Alexander, Science Education (member). 2021.
Shana McAlexander, Science Education (member). 2021.
Kayla Norville (member). 2019.
Osman Aksit (member). 2018.
Ana Patricia Maroto, Teacher Education and Learning Sciences (member). 2017.

Yiqiao Xu, Dept. of Computer Science, NCSU (member)

PROFESSIONAL DEVELOPMENT

From Boundaries to Breakthroughs: Harnessing Faculty Research & Innovation Mar. 2025-
Entrepreneurship course to support advancing faculty research commercialization

Online Course Improvement Program, NCSU Aug. 2020

Sweat Equity Challenge (semester-long entrepreneurship program), NCSU Spring 2020

Applying the QM Rubric (APPQMR) workshop, NCSU Dec. 2019

Basics of Virtual Reality (4-hour workshop), NCSU Dec. 2018

Penn Neuroscience Boot Camp Jul. 2012

fMRI (Functional Magnetic Resonance Imaging) Methodology, U. Michigan Aug. 2008

Nano Education Outreach PD Workshop, NISE and Exploratorium Museum May 2007

Atomic Force Microscopy, 80-hr research experience Fall 2008