CURRICULUM VITA

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EDUCATION

2020	Doctor of Philosophy	**University of Central Arkansas, Conway, Arkansas** Interdisciplinary Leadership Studies Emphasis in Gifted & Talented Teacher Leader Identity Development
2010	Master of Arts in Teaching	**Louisiana College, Pineville, Louisiana** Secondary Education Emphasis in Science Education
1998	Bachelor of Science	**University of North Texas, Denton, Texas** Comprehensive Elementary Education Content Emphasis: Science Education

TEACHING CERTIFICATIONS

National Board Certification: Early Adolescence, ages 11-15 Science (2005 - 2025)

Secondary Science Certification-Secondary Chemistry, Physics, and General Earth Sciences (grades 7-12, Arkansas & Louisiana)

Gifted and Talented (grades K-12, Arkansas)

Comprehensive Elementary (grades 1-8, Louisiana & Texas)

Google Educator Certification Level 1 & 2 (2018-2027)

International Society for Technology Education Online Higher Education (in progress)

UNIVERSITY ACADEMIC POSITIONS & TEACHING COURSES

2014 - Clinical Instructor II (promotion in 2020), University of Central Arkansas: Analysis & Practice of Teaching (MAT, Graduate), Redefining Educators in the Digital Age (EDDL, Graduate), Universal Design for Learning (ITEC, Graduate), Online Teaching & Instructional Strategies (ITEC, Graduate), Foundations of Digital Age Teaching and Learning (EDDL, Graduate), Integrating Technology and Teaching (hybrid, and online asynchronous, T&L, Undergraduate), Historical Perspective of Education (T&L, Undergraduate), Concepts of Science (SCI, Undergraduate),

Integrating Curriculum and Lesson Planning (SCI, Undergraduate), Concepts of Earth and Physical Science (SCI, Undergraduate), Applications of Middle Level Science (SCI, Undergraduate), Step 1: Inquiry Applications to Teaching (T&L, Undergraduate), Knowing and Learning: STEM Pedagogy (T&L, Undergraduate), Classroom Interactions ((T&L, Undergraduate), Project-Based Learning ((T&L, Undergraduate), Internship Supervision ((T&L, Undergraduate), Advanced Strategies for Teaching and Learning in Middle Level Content Specific Classrooms ((T&L, Undergraduate), Analysis and Practice of Teaching, STEM Methods, Models (MAT, Graduate), Internship Supervision (MAT, Graduate), Designing Authentic Learning Opportunities Through PBL (EDDL, Graduate)

2020 - 2025 Co-PI, ATOM Scholars, NSF grant-funded project, University of Central Arkansas

2014 - 2023 Secondary Science Education Program Coordinator, University of Central Arkansas

2012 - 2014 UALRteach Assistant Director, University of Arkansas at Little Rock

2013 - 2014 Adjunct Instructor, University of Arkansas at Little Rock: Middle and Secondary Level Integrated Science Methods, Elementary Science Methods, (Undergraduate)

2008 - 2012 Adjunct Instructor, Secondary Science Education, Louisiana College

CLASSROOM TEACHING POSITIONS & TEACHING COURSES

2006 - 2012 Gifted and Talented and Honors Science Teacher, 7th and 8th grade, Pineville Jr. High School, Pineville, LA: Earth Science, Space Science, Life Science, Project Lead the Way Engineering

2001 - 2006 Science Teacher, 8th grade, Alexandria Middle Magnet School, Alexandria, LA: Earth Science, Space Science, Physical Science (high school credit)

1998 - 2000 Science Teacher, 8th grade, DeSoto East Jr. High School, DeSoto, TX: Earth Science, Space Science, Biology, Physics, Chemistry

RESEARCH / PROJECT AFFILIATIONS

2026 - **Co-Principal Investigator**, National Science Foundation Research Council - in development. University of Central Arkansas.

- Investigating the effects of scholarship, support, peer instruction, mentoring, and supplemental instruction in calculus courses on

fostering a diverse community of future chemists. Co-PI: Dr. Faith Yarberry.

2023 - 2025 **Co-Principal Investigator**, Project iBEAMGT, University Research Council - funded. University of Central Arkansas.

- Investigating the effects of teacher professional development on the identification of, and provision of services to, gifted and talented students who are children with disabilities (2e). Co-PIs: Dr. Debbie Dailey, Dr. Alicia Cotabish, and Dr. Claire Hughes.

2020 - 2025 **Co-Principal Investigator**, ATOM Scholars, National Science Foundation Research Council - funded. University of Central Arkansas.

- Investigating the effects of scholarship, support, peer instruction, mentoring, and supplemental instruction in introductory chemistry courses on fostering a diverse community of future chemists. Co-PIs: Dr. Faith Yarberry, Dr. Darshon Reed.

2023 - 2024 **Instructional Specialist**, *LUNA*: The Eclipse Superhero, Arkansas Arts Council Collaborative Project Support Grant - funded. University of Central Arkansas.

- Commissioning *LUNA*, a 30’ inflatable sculpture designed by artist Morton Brown, and transporting *LUNA* to area schools to engage in STEAM workshops that combine art and science with superhero play. PI: Dr. Gayle Seymour (with College of Art and Design, College of Education, and College of Natural Science and Mathematics)

2022 - 2023 **Principal Investigator**, Culturally Responsive Teaching and Learning Through Games Project - not funded. University of Central Arkansas.

- Investigated the impact of secondary teacher candidates self-efficacy in culturally responsive teaching through game-based learning.

2022 - 2023 **Co-Principal Investigator**, Chemistry Videos Project - funded, University of Central Arkansas.

- Investigated the impact of using chemistry videos for instructional support of non-chemistry majors and the effects of science content video creation on middle-level teacher candidate science content teacher efficacy. Co-PI: Dr. Julie Eberle

2019 - 2023 **Qualitative Research Specialist**, Preservice Special Education Teachers Making Project - not funded, University of Central Arkansas.

- Investigated the impact of special education teacher candidates’ perceptions, conceptions, acting knowledge, and efficacy when teaching students with disabilities through making.

2018 - 2019 **Co-Principal Investigator**, Leadership Self-Identity Development in Gifted and Talented Teachers and Administrators Project - not funded, University of Central Arkansas.

- Investigated the differences of leadership self-identity and leadership perception (motivation to lead and leadership

orientation) between teachers and administrators of GT education. Co-PI: Dr. Debbie Dailey

2017 - 2018 **Co-Principal Investigator**, Gender in STEM Project - not funded. University of Central Arkansas.
- Investigated variables related to STEM teacher candidates' pursuit and perseverance in choosing a STEM career. Co-PI: Dr. Debbie Dailey

2017 - 2018 **Co-Principal Investigator**, Secondary Science Teacher Preparation Project - not funded. University of Central Arkansas.
- Investigated perceived understandings of Next Generation Science Standards concepts among secondary science teachers. Co-PI: Dr. Debbie Dailey

2017 - 2018 **Co-Principal Investigator**, Teacher Interns' Quality of Life Project - not funded. University of Central Arkansas.
- Investigated the correlation between teacher interns' quality of life and academic achievement and validating the World Health Organization Quality of Life (WHOQOL) Instrument with teacher interns. Co-PI: Ms. Yolanda Ornelas

2015 - 2019 **Instructional Specialist**, STEMulate Engineering Academy - funded, University of Central Arkansas.
- Investigated the impact of STEMulate Engineering Academy on teachers' and students' engineering knowledge, skills, and perceptions. Additionally, the camp provided professional development to area teachers.

2005 - 2007 **Instructional Specialist**, ANDRILL Project, National Science Foundation Research Council-funded.
- Member of the Antarctic Geologic Drilling Program (ANDRILL) on the Southern McMurdo Sound Project. Co-Pis: Dr. Dave Harwood (University of Nebraska, Lincoln) and Dr. Richard Levy (University of Nebraska, Lincoln)

HONORS AND ACCOLADES

2025 2025 Global Learning Fellow (COIL)

2025 UCA Center for Excellence in Teaching and Academic Leadership (CETAL) Recognition of Achievement with Teaching Excellence with Generative AI.

2025 Apple Teacher Portfolio badge

2024 AI in Education Explorer Badge, Auburn University

2024 Invited Guest Editor for a special edition in the Journal of Advanced Academics

2022 Delta Kappa Gamma International Educators Foundation Lucile Cornetet Individual Professional Development Award

2022 Outstanding Teaching Award for the College of Education, University of Central Arkansas

2021 Apple Teacher badge

2020 Promotion to Clinical Instructor II, University of Central Arkansas
2019 Strategic Instruction Model Pre-service Professional Developer
2017 Tommie Sue Anthony Endowment Fellowship for the Education of the Gifted, University of Central Arkansas
2013 UALR Academy for Teaching and Learning Excellence Distinguished Teaching Fellow, University of Arkansas at Little Rock
2012 UALR Academy for Teaching and Learning Excellence Distinguished Teaching Fellow, University of Arkansas at Little Rock
2012 TED-Ed Distinguished Educator
2011 PBS Innovative Teacher Award, 2nd place winner
2011 Louisiana Computer Using Educators (LaCUE) *Regional Middle School Teacher of the Year Award*
2009 Toyota International Teacher Program Galapagos Islands Participant, an IIE Project
2008 Pineville Junior High *Teacher of the Year*
2008 Edward C. Roy *National Teacher of the Year*
2007 National Association of Geoscience Teachers *Outstanding Earth Science Teacher of the Yea*r for Louisiana
2006 U.S. Department of Education's *Star Teaching Award* for Louisiana
2006 Louisiana Earth Science Teachers Association *Louisiana Earth Science Teacher of the Year*
2005 Armada Project Participant, an NSF project
2005 Regional Sam's Club *Teacher of the Year,* Alexandria, Louisiana
2005 Alexandria Middle Magnet *Teacher of the Year*
2003 Alexandria Sylvan Learning Center's *My Favorite Teacher* Award
2003 *Teacher of the Month - November*, Alexandria Middle Magnet
2000 *Most Creative Teacher*, DeSoto East Junior High, DeSoto, TX

SCHOLARLY AND CREATIVE ENDEAVORS

GRANTS AND CONTRACTS:

Externally-funded Grants (Contributing Author – Funded)

2022 Lucile Cornetet INDIVIDUAL Professional Development (CIPD) Award, Funded. ($1,380).
2019 - 2025 National Science Foundation's Scholarships in Science, Technology, Engineering and Mathematics (S-STEM) Program, *ATOM Scholars*, Funded. ($650,000).

University/College-funded Grants

2019, 2023 UCA Faculty Development Grant
2017, 2018, 2019, Graduate Student Research Grants

PUBLICATIONS

REFEREED / PEER-REVIEWED PUBLICATIONS:

20. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. (2025, May). Unpacking the NAGC gifted programming standards: Standard 1.3. *Teaching for High Potential*. 22-23.
19. Buchanan, M. (2024, November). Expanding horizons in science education. *Teaching for High Potential*. 11 & 20.
18. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. (2024, August). Unpacking the NAGC gifted programming standards: Standard 1.2. *Teaching for High Potential*. 22-23.
17. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. (2024, May). Unpacking the NAGC gifted programming standards: Standard 1.1. *Teaching for High Potential*. 22-23.
16. Buchanan, M. (2024, May). HQIMs with AI. *Teaching for High Potential*. 11.
15. Buchanan, M. (2024, February). Igniting excitement for the 2024 total solar eclipse with 2e learners and high-leverage practices. *Teaching for High Potential*. 23.
14. Dailey, D., Cotabish, A., Buchanan, M., Marshall, L. (2024). Interrupted programming: School shutdown and gifted student identification and services. *Journal of Advanced Academics.* 35(2), 263-289. https://doi.org/10.1177/1932202X241232724
13. Trumble, J., Wake, D., & Buchanan, M. (2024). Preservice special education teachers using making for academic interventions: An exploratory multiple case study. *Contemporary Issues in Technology and Teacher Education, 24*(3). https://citejournal.org/volume-24/issue-3-24/current-practice/preservice-special-education-teachers-using-making-for-academic-interventions-an-exploratory-multiple-case-study/.
12. Buchanan, M. (2023, November). Embracing the 2024 total solar eclipse: Safety awareness. *Teaching for High Potential*. 23.
11. Buchanan, M. (2023, August). Claim, evidence, and reasoning. Oh yeah! *Teaching for High Potential*. 8.
10. Buchanan, M. & Price, V. (2023, May). Writing in Science. *Teaching for High Potential*. 19.
9. Buchanan, M. (2022, November). Problem solving with the mind of an artist. *Teaching for High Potential.* 19.
8. Buchanan, M. (2022, May). Teaching science through card games. *Teaching for High Potential.* 19.
7. Buchanan, M. (2022, February). Teaching science through games. *Teaching for*

High Potential. 19.

6. Buchanan, M. (2021, November). Communicating about science beyond the classroom. *Teaching for High Potential.* 19.
5. Cotabish, A. & Buchanan, M. (2021, May). Facilitating meaningful science learning in a virtual world. *Teaching for High Potential*. 9.
4. Cotabish, A. & Buchanan, M. (2021, February). Experiential learning in a virtual world. *Teaching for High Potential*. 12-13.
3. Buchanan, M. & Dailey, D. (Winter 2020). Technology tools for presentation. *TAG Updates. http://cectag.com/wp-content/uploads/2020/02/TAG-Update-Winter-2020.pdf.*
2. Buchanan, M. & Dailey, D. (Fall 2019). Technology tools for investigation, part 2. *TAG Updates. http://cectag.com/wp-content/uploads/2019/11/Fall-2019-TAG-Newsletter-1.pdf*.
1. Dailey, D. & Buchanan, M. (Summer 2019). Technology tools for investigation. *TAG Updates. http://cectag.com/wp-content/uploads/2019/07/TAG-Update-Summer-2019-red.pdf.*

BOOK CHAPTERS:

7. Buchanan, M. (in review). One teacher's leader identity development story told through visual narrative methods In J. Dehart (Ed.) *Narrative Methodologies in Education Research*. IGI Global.
6. Mack, L., & Buchanan, M. (submitted). Contextualizing science within engineering concepts. In D. Dailey & A. Cotabish (Eds.) *Designing Innovative Engineering Instruction for High Ability Learners in K-8 Classrooms*, *2nd Edition.* Taylor & Francis.
5. Cotabish, A. & Buchanan, M., & Dailey, D. (2023). Science curricular considerations for advanced learners. In J. Van Tassel-Baska & C. A. Little (Eds). *Content-based Curriculum for Gifted Learners, 4th Edition*. Routledge/Taylor & Francis.
4. Dailey, D., Trumble, J., & Buchanan, M. (2022). Aligning gifted programming standards with ISTE standards for enhanced student outcomes. In S. K. Johnson, D. Dailey, & A. Cotabish (Eds.), *NAGC Pre-K-Grade 12 Gifted Education Programming Standards, 2nd Edition.* Routledge/Taylor & Francis.
3. Dailey, D. & Buchanan, M. (2021). Recognizing and developing science talent among diverse populations. In J. L. Nyberg & J. A. Manzone (Eds.), *Creating Equitable Services for the Gifted: Protocols for Identification, Implementation, and Evaluation*. IGI Global.
2. Buchanan, M. (2017). A triad of instructional coaching: Changing classroom practices. In D. Dailey & P. Kohler-Evans (Eds.), *Coaching innovations: Providing instructional support anywhere, anytime,* Rowman and Littlefield.
1. Buchanan, M., & Dailey, D. (2016). Integrating engineering design processes into classroom curriculum. In D. Dailey & A. Cotabish (Eds.), *Designing innovative*

engineering instruction for high ability learners in K-8 classrooms. Prufrock Press.

PUBLISHED PRACTITIONER TOOLS / CURRICULUM MATERIALS:

6. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. (in progress). National Association for Gifted Children Professional Standards Infographics for Teachers.
5. Jones-Roberson, J., Breedlove, L., Buchanan, M., Dailey, D., Dickson, K., Inman, T., Robers, J. L., Troxclair, D. (2020, May). *A critical call to action: Supporting equity, diversity, and access for gifted students*. https://cectag.com/sites/default/files/2022-03/Call-to-Action-2020-with-All-Endorsements.pdf
4. Buchanan, M. (2013). *Feasting on faults*. PolarTREC online polar professional development resource. Retrieved from http://bit.ly/17ZpIrx
3. Buchanan, M. (2013). *Gridiron physics*. TED-Ed lessons worth sharing. [Lesson and Script]. http://youtu.be/nF5S0FLp19Y
2. Buchanan, M. B., & Demers, W. (2010). Louisiana public broadcasting global climate change challenge. http://beta.lpb.org/index.php/STEM/stem_resources/
1. Buchanan, M. B. (2008). *Eighth grade comprehensive curriculum component.* In Louisiana comprehensive curriculum. Louisiana Department of Education.

DISSERTATION:

1. Buchanan, M. B. (2020). *Becoming and being: A narrative study of leadership self-identity development in gifted and talented teachers.* Doctoral dissertation. https://www.proquest.com/openview/735048a7498f6f7373cd9c007b47e92b/1.pdf?pq-origsite=gscholar&cbl=51922&diss=y

PRESENTATIONS

REFEREED NATIONAL AND INTERNATIONAL PRESENTATIONS:

47. Cotabish, A., Dailey, D., Buchanan, M., Marshall, L., & Mack, L. (2025, Nov 13-16). *Harnessing the Power of AI: K-12 STEM Education Innovations for Gifted Learners.* [Paper Presentation]. National Association for Gifted Children, Pittsburgh, PA
46. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. (2025, Nov 13-16). *Transforming Teacher Practice: Creating Professional Learning for the Gifted Standards* [Paper Presentation]. National Association for Gifted Children, Pittsburgh, PA
45. Buchanan, M., Roberts, J., Johnsen, S., Coder, K., Farrell, P., Jaconette, T.,

Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. 2025, Nov 13-16). *Engaging with the New Teacher Preparation Standards & Prof Standards Committee Presentation* [Paper Presentation]. National Association for Gifted Children, Pittsburgh, PA.

44. Buchanan, M., Coder, K., Farrell, P., Jaconette, T., Kolb, K., Marshall, L., McShane, A., Potts, J., & Wolfgang, C. 2024, Nov 21-24). *Tips and Tools for Using the Standards* [Paper Presentation]. National Association for Gifted Children, Seattle, WA.
43. Dailey, D., Cotabish, A., Buchanan, M. (2024, Nov 21-24). *Unlocking the Power of AI for Gifted Learners.* [Paper Presentation]. National Association for Gifted Children, Seattle, WA.
42. Yarberry, F., Buchanan, M., Reed, D., (2024, Nov 8-10). *ATOM Scholars Program Increase Student Engagement, Academic Success, and Retention in Chemistry Majors*. [Poster Presentation]. S-STEM Scholars & PI Meeting, Chicago, IL.
41. Yarberry, F., Buchanan, M. Desrochers, P., Massey, M., Reed, D., Long, M., Puckett, C., Hardester, T., Stanford, G. (2024, Aug 19). Supplemental instruction improves retention rates and study skills in freshman and sophomore chemistry courses [Paper Presentation]. American Chemical Society, Denver, CO.
40. Yarberry, F., Buchanan, M. Desrochers, P., Massey, M., Reed, D., Long, M., Puckett, C., Hardester, T., Stanford, G. (2024, Aug 19). Sci-Mix [Poster Presentation]. American Chemical Society, Denver, CO.
39. Dailey, D. Cotabish, A. Buchanan, M. Hughes, C., & Marshall, L. (2024, Apr 12-14). *Interrupted Programming: School Shutdown and Gifted Student Identification and Services.* [Paper Presentation]. AERA Annual Meeting, Philadelphia, PA
38. Yarberry, F., Buchanan, M. Desrochers, P., Massey, M., Reed, D., Long, M., Puckett, C., Hardester, T., Stanford, G. (2024, Mar 19). *The impact of supplemental instruction on the student's retention of fundamental concepts in organic chemistry I and organic chemistry II* [Poster Presentation]. American Chemical Society, New Orleans, LA.
37. Dailey, D. Cotabish, A. Buchanan, M. Hughes, C., & Marshall, L. (2024, Mar 13-17). *iBEAM-GT: identification - Building Equity & Access Models for GT/2e*. [Poster Presentation]. Council of Exceptional Children Conference, San Antonio, TX.
36. Cotabish, A., Dailey, D., Buchanan, M. (2024, January 3-6). *Gifted Student Identification and Services: Impact of the Pandemic Shutdown.*[Paper Presentation]. Hawaii International Conference on Education, Kona, HI.
35. Dailey, D., Cotabish, A., Miller, R., Jackson, K., & Buchanan, M. (2023, November 9-13). *Revision of a University Gifted Endorsement Program During a Time of Program Cuts.* [poster presentation] National Association of Gifted Children, Orlando, FL.
34. Housand, B., Compton, L., McNair, A., Guilbault, K., Farrell, S. & Buchanan, M. (2023, November 9-13). *Playground of Possibilities in AI*. [Pre-conference

workshop]. National Association of Gifted Children, Orlando, FL.

33. Buchanan, M., & Dailey, D. (2023, March 1 - 3) *Enhancing Student Learning with PBL: The Launch.* Council of Exceptional Children Conference, Louisville, KY.
32. Buchanan, M., & Keyes, D., (2021, April 8-12). *Teacher Leadership Self-Identity Development: One Teacher's Story*. [Paper Presentation]. AERA Annual Meeting, online.
31. Buchanan, M., & Dailey, D., (2021, Feb 8-13). *Stories of Leadership Self-Identity Development in Teachers of Gifted and Talented Education: A Narrative Inquiry.* [Poster Session]. Council of Exceptional Children Conference, online.
30. Dailey, D., & Buchanan, M. (2021, Feb 8-13). *Meeting the Needs of Gifted Students in an Online Classroom* [Paper Session]. Council of Exceptional Children Conference, online
29. Trumble, J., Dailey, D. D., Buchanan, M. & Cotabish, A. (2020, Apr 17 - 21). *Investigating Failure and Perseverance of Gifted and Nongifted Adolescents: A Mixed-Methods Study* [Poster Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/ubck9zz (Conference Canceled)
28. Buchanan, M. (2020, Feb 5-9). *Leader identity development in elementary gifted and talented education teachers: A pilot study*. [Poster Session]. Council of Exceptional Children Conference, Portland OR.
27. Dailey, D., & Buchanan, M. (2019). *Engaging gifted learners in real-world problem solving.* Session presented at the 2019 Symposium for Special Education, Gifted and Twice Exceptional: Differentiating and Enriching Experiences, the University of Puerto Rico, San Juan, Puerto Rico.
26. Dailey, D., Cotablish, A., & Buchanan, M. (2019). *Instructional approaches to support gifted learners.* Paper presented at the 2019 annual meeting of the Council of Exceptional Children Conference, Indianapolis, IN.
25. Buchanan, M. (2019). *What About Engineering: Integrated STEM Approach to Addressing Multiple Content Standards.* Session presented at the 2019 annual meeting of the National Science Teaching Association, St. Louis, MO.
24. Gallavan, N., Thompson, A., Styles-Foster, S., & Buchanan, M. (2019). C*oaching Doctoral Candidate Colleagues.* Round Table presentation at the 2019 annual meeting of the Association of Teacher Educators, Atlanta, GA. & Rising Professors of Teacher Education (Round Table)
23. Gallavan, N., Thompson, A., Styles-Foster, S., & Buchanan, M. (2019). *Rising Professors of Teacher Education.* Round Table presentation at the 2019 annual meeting of the Association of Teacher Educators, Atlanta, GA.
22. Trumble, J., Wake, D., & Buchanan, M. (2019, April). *Preservice teachers using maker pedagogy to teach students with disabilities: A multiple case study*. Paper presented at the 2019 annual meeting of the American Education Research Association Conference, Toronto, Canada.
21. Buchanan, M. (2018). *How confidence in content knowledge impacts confidence in early field teaching experiences.* Paper presented at the 2018 annual meeting of the UTeach Conference, Austin, TX.

20. Buchanan, M. (2018). *Overcoming the challenges of UTeach replication in rural settings.* Paper presented at the 2018 annual meeting of the UTeach Conference, Austin, TX.
19. Buchanan, M. (2018). *STEMteach teacher candidates' beliefs, virtual coaching with interns*. Paper presented at the 2018 annual meeting of the American Teacher Educators Conference, Las Vegas, NE.
18. Dailey, D., Cotablish, A., & Buchanan, M. (2018). *Engineering instruction for high ability learners.* Paper presented at the 2018 annual meeting of the National Association for the Gifted Children, Minneapolis, MN.
17. Dailey, D., & Buchanan, M. (2018). *Engaging students with engineering: Increasing access and opportunity for all learners*. Poster presented at the 2018 annual meeting of the American Education Research Association Conference, New York City, NY.
16. Dailey, D., Cotablish, A., & Buchanan, M. (2018). *What about engineering? An integrated STEM approach to addressing multiple content standards.* Paper presented at the 2018 annual meeting of the Council of Exceptional Children Conference, Tampa, FL.
15. Wake, D., Cotabish, A., Dailey, D., & Buchanan, M. (2018). *The comparison of instructional practices between virtually and traditionally supervised teacher candidates in their culminating internship.* Paper presented at the 2018 annual meeting of the American Teacher Educators Conference, Las Vegas, NE.
14. Buchanan, M. (2017). *A look into teacher candidates' reflective teaching practice.* Paper presented at the 2017 annual meeting of the UTeach Conference, Austin, TX.
13. Buchanan, M. (2017). *Arkansas UTeach share-a-thon: Inquiry-based math and science lessons for elementary and secondary.* Paper presented at 2014, 2015, 2016, 2017 annual meeting of the Arkansas Curriculum Conference, Little Rock, AR.
12. Dailey, D., Miller, R., Cotablish, A., Jackson, K., & Buchanan, M. (2017). *Designing innovative engineering instruction for high ability learners in K-8 classrooms.* Paper presented at the 2017 annual meeting of the National Association for the Gifted Children, Charlotte, NC.
11. Dailey, D., Cotablish, A., & Buchanan, M. (2017). *Engaging advanced learners in STEM content.* Paper presented at the 2017 annual meeting of the Council of Exceptional Children Conference, Boston, MA.
10. Dailey, D., & Buchanan, M. (2016). *Picking up STEAM in a summer gifted program, Stuck on creativity.* Paper presented at the 2016 annual meeting of the National Association for the Gifted Children, Orlando, FL.
9. Buchanan, M. (2016). *Middle Level Madness.* Session presented at the 2013 annual meeting of the National Science Teaching Association, Nashville, TN.
8. Dailey, D., Cotablish, A., & Buchanan, M. (2016). S*TEM opportunities for gifted*

learners. Paper presented at the 2016 annual meeting of the Council of Exceptional Children Conference, St. Louis, MO.

7. Dailey, D., & Buchanan, M. (2015). *Engineering instruction for high ability learners in K-8 classrooms.* Paper presented at the 2015 annual meeting of the National Association for the Gifted Children, Phoenix, AZ.
6. Buchanan, M. & Chaney, K., (2014). *SMILE with Physics(Science & Math Inquiry Learning Explored).* Session presented at the 2014 annual meeting of the National Science Teaching Association, Boston, MA.
5. Buchanan, M. & Chaney, K., (2013). *SMILE with Dr. Seuss (Science & Math Inquiry Learning Explored).* Session presented at the 2013 annual meeting of the National Science Teaching Association, San Antonio, TX.
4. Buchanan, M. & Chaney, K., (2013). *SMILE with Dr. Seuss (Science & Math Inquiry Learning Explored).* Session presented at the 2013 annual meeting of the National Council of Teachers of Mathematics, Boston, MA.
3. Buchanan, M. (2007). *Armada Project - Lessons from the Antarctic.* Session presented at the 2007 annual meeting of the National Science Teaching Association, Anaheim, CA.
2. Buchanan, M. (2006). *Armada Project - Lessons from the Antarctic.* Session presented at the 2006 annual meeting of the National Science Teaching Association, Chicago, IL.
1. Buchanan, M. (2005). *Armada Project - Lessons from the Antarctic.* Session presented at the 2006 annual meeting of the National Science Teaching Association, Dallas, TX.

KEYNOTE PRESENTATIONS:

Buchanan, M. (2007) Jack Kilby Science Day, Barton County Community College in Great Bend, Kansas, Keynote Speaker.

INVITED NATIONAL WEBINAR PRESENTATIONS:

3. Housand, B., Compton, L., McNair, A., Guilbault, K., Farrell, S. & Buchanan, M. (2024, Feb 11). *Are you still Playing? It's Time to Come Inside*. National Association of Gifted Children. online
2. Buchanan, M., & Fortney, B. (2020, July-1). *Knowing and Learning in Math and Science*. UTeach STEM Educators Virtual Summit, online.
1. Buchanan, M., & Cawein, M. (2017). *Where might teaching lead you?* Kappa Delta Pi National Webinar Series.

REFEREED STATE AND REGIONAL PRESENTATIONS:

23. Ward, S., Buchanan, M., Bundrick, O., & White, M., (2025, July 28-30). *How One University is Integrating HQIM into Initial License and Leadership Preparation*

Programs. Arkansas Association of Education Administrators Annual Summer Conference, Little Rock, AR.

22. Buchanan, M. (2025, July 17). *Power Up Your Classroom with Brisk: Using Brisk to Create, Align, and Assess!* University of Central Arkansas College of Education Outreach Professional Development Workshop, online.
21. Jackson, N., Dailey, D., Cotabish, A., Miller, R., Miller, C., Buchanan, M. (2024, Feb 23-25). *AI Classroom Gamechanger*. Arkansans for Gifted and Talented Education, Hot Springs, AR.
20. Dailey, D., Trumble, J., Buchanan, M. (2022, Feb 18-20). *Aligning gifted and technology standards to enhance student learning*. Arkansans for Gifted and Talented Education, Rogers, AR.
19. Buchanan, M., Yarberry, F., Massey, M., Long, M., Anderson, D., Desrochers, P., Hunt, W. (2022, November 9-11). *Supplemental Instruction: An Assessment of Confidence in Freshman Chemistry Courses*. [Paper Presentation]. MSERA Annual Meeting, Little Rock, AR.
18. Jones-Roberson, J., Breedlove, L., Buchanan, M., Dailey, D., Dickson, K., Inman, T., Robers, J. L., Troxclair, D. (2020, Dec 3-5). *A critical call to action: Supporting equity, diversity, and access for gifted students* [Paper Presentation]. Texas Association for the Gifted and Talented Conference, online.
17. Dailey, D., Trumble, J., & Buchanan, M. (2020, July-9). *Utilizing Technology Tools for Investigation in PBL.* University of Central Arkansas College of Education Outreach Professional Development Workshop, online.
16. Dailey, D., Trumble, J., Buchanan, M., & Cotabish, A. (2020, Oct-29). *Developing Engineering Design Skills in a Children's Summer Camp* [Paper Presentation]. MSERA Annual Meeting, online.
15. Buchanan, M. (2019). *Designing field trips.* Paper presented at the 2019 annual meeting of the Arkansas for Gifted and Talented Education, Little Rock, AR
14. Dailey, D., Miller, R., Cotablish, A., Jackson, K., & Buchanan, M. (2017). *Engaging advanced learners in STEM content.* Paper presented at the annual meeting of the Arkansas Association of Gifted Education Administrators, Little Rock, AR.
13. Dailey, D., & Buchanan, M. (2016). *Using technology to engage learning in STEM.* Paper presented at the 2016 annual meeting of the Hot Springs Technology Institute, Hot Springs, AR.
12. Buchanan, M. (2016). *Arkansas UTeach share-a-thon: Inquiry-based math and science lessons for elementary and secondary.* Paper presented at 2016 annual meeting of the Arkansas Curriculum Conference, Little Rock, AR.
11. Trumble, J., & Buchanan, M. (2016). *Augmented reality connecting to the reality of the classroom.* Paper presented at the 2016 annual meeting of the Hot Springs Technology Institute, Hot Springs, AR.
10. Buchanan, M. (2015). *Arkansas UTeach share-a-thon: Inquiry-based math and science lessons for elementary and secondary.* Paper presented at 2015 annual meeting of the Arkansas Curriculum Conference, Little Rock, AR.
9. Buchanan, M. (2014). *Arkansas UTeach share-a-thon: Inquiry-based math and*

science lessons for elementary and secondary. Paper presented at 2014 annual meeting of the Arkansas Curriculum Conference, Little Rock, AR.

8. Buchanan, M. (2011). *The Virtual Classroom.* Session presented at the 2011 annual meeting for the Louisiana Association of Computer Using Educators, Baton Rouge, LA.
7. Buchanan, M. (2010). *Armada Project - Lessons from the Antarctic.* Session presented at the 2010 annual meeting of the Louisiana Science Teachers Association, West Monroe, LA.
6. Buchanan, M. (2009). *Armada Project - Lessons from the Antarctic.* Session presented at the 2009 annual meeting of the Louisiana Science Teachers Association, New Orleans, LA.
5. Buchanan, M. (2006). *Vlogging 101.* Session presented at the 2006 annual meeting for the Louisiana Middle School Association, Lafayette, LA.
4. Buchanan, M. (2004). *Engaging Gifted Students in STEM Content*. Session presented at the 2004 annual meeting for the Louisiana Science Teachers Association, Shreveport, LA.
3. Buchanan, M. (2003). *Inquiry with a Hovercraft.* Session presented at the 2003 annual meeting for the Louisiana Middle School Association, Lafayette, LA.
2. Buchanan, M. (2002). *Engaging Gifted Students in STEM Content*. Session presented at the 2002 annual meeting for the Louisiana Science Teachers Association, New Orleans, LA.
1. Buchanan, M. (2002). *iMovie Investigations in the Classroom.* Session presented at the 2002 annual meeting for the Louisiana Middle School Association, Lafayette, LA.

INVITED PRESENTATIONS (Universities / State Organizations)

2. Buchanan, M. (August 13, 2024). *AI in Education.* PEO, Conway, AR Chapter.
1. Buchanan, M. (July 7, 2023). *Teacher Leadership Self-Identity Development.* "Teacher Leadership & Teacher Education" course for the University of New Mexico. virtual.

WORKSHOP PRESENTATIONS:

8. Buchanan, M. (July 17, 2025). UCA Summer Professional Learning Series presenter: *Power Up Your Classroom with Brisk: Using Brisk to Create, Align, and Assess!*
7. Buchanan, M. (June 11, 2024). UCA Summer Professional Learning Series presenter: *AI for differentiation.*
6. Buchanan, M. (June 27, 2023). UCA Summer Professional Learning Series presenter: *Games in the classroom.*
5. Buchanan, M. (August 3-4, 2021). *Project-Based Learning*, professional development for Forest Heights STEM Academy's teachers and staff.

4. Buchanan, M. (June - July, 2016). *Excellence in Elementary School Science,* Arkansas STEM Institute, 2016 summer-long Engineering in science workshops for Central Arkansas teachers.
3. Buchanan, M. (November 6, 2014). *SEED: Science Education through Engineering Design* NCLB workshop for teachers of grades 4-8 using Engineering is Elementary and Engineering is Everywhere.
2. Buchanan, M. (January - February, 2014). *VICTER Power Box Workshop*, Integrated Middle School Science for Little Rock School District teachers.
1. Buchanan, M. (2008-2009) monthly statewide presentations at school districts to educate teachers about Louisiana's Comprehensive Curriculum and integration of Literacy Strategies into science and math.

SERVICE ACTIVITIES

INTERNATIONAL COMMITTEE / SERVICE INVOLVEMENT:

Teachers2Teachers Global: Costa Rica professional development team (2017)
Toyota International Teacher Program Galapagos Islands Participant, an IIE Project, creating environmental awareness curriculum for the Galapagos Conservancy (2009)
Antarctic Geologic Drilling Program (ANDRILL), Southern McMurdo Sound Project, scientific drilling project gathering historical climate change data from rock layers u see the ocean (2005)
People to People Primary Delegation Leader, Australia and Mediterranean cultural explorations with middle level students (2005 – 2007)

NATIONAL COMMITTEE / SERVICE INVOLVEMENT:

National Association for Gifted Children
STEM Network Chair (2023-2024), Chair-Elect (2021-2022)
Professional Standards Committee (2021-2027, Chair 2023-2025, Co-Chair 2025-2027)
Preservice General Education Standards Task Force Committee (2025)

Council for Exceptional Children
Yes I Can Award Committee (2023-2025, Chair 2024-2025)
Leadership CEC (2022-2023)

Council for Exceptional Children - The Association for the Gifted (TAG)
Executive Board Member - Public Relations Coordinator (2019-2024)

Mid-South Educational Research Association
2022 MSERA conference planning committee

American Educational Research Association - Division K (Teaching and Teacher Education)

Graduate Student Executive Board (2019-2021
Digital Communications Committee, Chair 2020-2021)

National Science Teaching Association
Science Matters Advisory Board (2013-2016, Chair 2014-2015)
Manager of Services for People with Disabilities for NSTA 2009 Conference – LA Chair

ARMADA Project Master Teacher, 2005 – 2006
Antarctic educator in residence (October 13, 2005 - December 3, 2005)

STATE & LOCAL COMMITTEE / SERVICE INVOLVEMENT:

ARKANSAS
Middle-Level Summer STEM Learning Camps, University of of Central Arkansas STEM Institute (July 2025)
Little Rock Central High School Junior Academy of Science project judge (February 14, 2025; February 10, 2023; February 12, 2021)
Ed Rising Conference, University of Central Arkansas (since 2021)
Little Rock Episcopal Collegiate IRB committee member (since 2021)
Arkansas STEM Festival judge, Maumelle Charter Schools (May 6, 2022; February 19, 2020)
STEAM Night project judge, Flightline Middle School (October 6, 2022)
2014 Next Generation Science Standards (NGSS) Arkansas Broad-Based Committee
Delta Kappa Gamma Society, Theta Chapter (member since 2012)
Arkansas Next Generation Science Standards (NGSS) Arkansas Broad-Based Committee, reviewed and assessed NGSS for national committee (2012-2013)
Arkansas Association of Gifted Education Administrators - member since 2014

Arkansas Science Teachers Association
Member (since 2012)
Executive Board Member - University/College Liasson (2015 - 2019)

LOUISIANA
Region IV Science Fair board member, 2002 to 2012 – Awards Chair 2005-2012
Pineville Jr. High Science Department Chair 2006-2012
Louisiana Public Broadcasting Global Climate Change Challenge (2010) worked on the instructional design plan for this project including the web-based instructional module and wrote the original instructional content and incorporate web resources and prepare a paper prototype for the instructional module and website
Louisiana Dept. of Education Curriculum Writing Team, 8th grade earth science course (2007-2008)
Centers for Ocean Sciences Education Excellence (COSEE) Advisory Council, teacher

member for Louisiana (2005-2007)
Louisiana Teacher Assistance and Assessment Program (LaTAAP) mentor (2006-2012)
Louisiana iLEAP Item Review State Committee (2003-2005)
Louisiana State Grade Level Expectations Committee, grades 5-8 science representative, (2003-2004)

Louisiana Science Teachers Association
Member (2001-2012)
Executive Board Member, Region VI Representative (2002 – 2007)
Executive Board Member, Secretary (2007 – 2009)

UNIVERSITY COMMITTEE / SERVICE INVOLVEMENT:

University of Central Arkansas' IRB Committee, COE member (2021-2025)
University of Central Arkansas STEM Institute STEM Day, student activity facilitator (annually since 2021)
College of Education and Teaching and Learning Department Curriculum Committee (2021-2025)
CAEP SPA report writer for STEMteach Science Program (2015-2022)
Peer coach to science education teacher candidates undergoing a program evaluation initiative