

Zachary T. Grimes, Ph.D.

100 College Drive, Paragould, AR 72450

[office] (870) 236-6901 ext 252

[email] zgrimes@crc.edu

[website] zacharytgrimes.weebly.com

EDUCATION & ASSOCIATED ACADEMIC AWARDS

In Progress	Graduate Certificate - Spiritual Leadership Harding School of Theology - Searcy, AR
May 2021	Ph.D. - Mathematics and Science Education <i>Concentration:</i> Science Education/Biology Education Middle Tennessee State University - Murfreesboro, TN <i>Dissertation Title:</i> A Mixed Method Evaluation of Anxiety Related to Biology Content in EC-16 Educators <i>Major Professor & Dissertation Chair:</i> Dr. G. E. Gardner <i>Dissertation Committee:</i> Dr. S. Bleiler-Baxter, Dr. R. L. Seipelt-Thiemann, Dr. K. Mangione, Dr. S. Lampley <i>Awards:</i> Dissertation Support Minigrant
August 2017	M. Sc. - Biology <i>Project Concentration:</i> Genetics & Bioinformatics Middle Tennessee State University - Murfreesboro, TN <i>Thesis Title:</i> Developing a Model of AFP Transcriptional Regulation by Afr2, a Gene Implicated in Liver Cancer <i>Major Professor & Thesis Chair:</i> Dr. R. L. Seipelt-Thiemann <i>Thesis Committee:</i> Dr. E. McClelland, Dr. J. Jessen <i>Awards:</i> J.J. Fletcher Endowed Research Award
August 2015	B.Sc. - Biology <i>Concentration:</i> Genetics & Biotechnology Middle Tennessee State University - Murfreesboro, TN <i>Awards:</i> Eugene F. Strobel Scholarship, The Homer Fund Scholarship, Mary C. Dunn Freshman Biology Scholarship, Undergraduate Research and Creative Activity (URECA) Grant

TOTAL GRADUATE CREDIT HOURS

Does not include Thesis or Dissertation credit hours (BIOL/MSE respectively). Syllabi and/or course descriptions available for confirmation upon request.

Biology: 34cr (M.Sc.), 14cr (Ph.D.)

Education: 15cr (SPSE rubric, Ph.D.), 10cr (MSE rubric, Ph.D.)

-SPSE: School Personnel and Service Education

-MSE: Mathematics and Science Education

LICENSES AND CERTIFICATIONS HELD

Arkansas Educator License 10185058 - Exp 12/31/27

-Biology/Life Science 7-12; Middle School Science 4-8

Quality Matters Certified - Applying the QM Rubric

ACADEMIC AND ADMINISTRATIVE POSITIONS HELD

Crowley's Ridge College - Administrative

Division Chair of Teacher Education - F24-present (Interim 10/23-7/24)

Director of EPP Accreditation and Licensure - F24-present

Interim Division Chair of General Studies - Sp22

-renamed Division of Arts & Sciences effective F23

Crowley's Ridge College - Faculty

Associate Professor of STEM Education - Sp24-present

Affiliate Faculty of Arts & Sciences - F24-present

Assistant Professor of Biology - F21-Sp24

Middle Tennessee State University

Graduate Teaching Assistant, Biology - F15-Sp19, Sp20-Sp21

Graduate Teaching Assistant, Education/MTeach - F18-F19

Adjunct Instructor Positions

Cumberland University

Lamar Institute of Technology

Lipscomb University

Middle Tennessee State University

Southeast Arkansas College

Volunteer State Community College

TEACHING & COURSE DEVELOPMENT EXPERIENCE

Course Descriptions and/or syllabi available upon request, where available.

Teaching Experience - Institutions

4-Year Institutions

Crowley's Ridge College - Paragould, AR
 Middle Tennessee State University -
 Murfreesboro, TN
 Cumberland University - Lebanon, TN
 Lipscomb University - Nashville, TN

2-Year Institutions

Southeast Arkansas College - Pine Bluff, AR
 Volunteer State Community College - Gallatin, TN
 Lamar Institute of Technology - Beaumont, TX

K-12 Schools

Ezell-Harding Christian School - Antioch, TN; Substitute Teacher for K-4
 Blackman Middle School - Murfreesboro, TN; Student Teacher in 7th Inclusion
 Riverdale High School - Murfreesboro, TN; Student Teacher in 9th Honors
 The Discovery School - Murfreesboro, TN; Student Teacher in 3rd Grade

Tertiary Experience - Non-Education Courses

<i>Division/ Content/ Population</i>	<i>Course Name</i>	<i>Online</i>	<i>On-Ground</i>
Non-Majors Biology	Biology I -Nature of Science, Chemistry, Cells, Energetics, Evolution	X	X
	Biology I Lab	X	X
	Biology II -Survey of Biodiversity, Ecology	X	
	Biology II Lab	X	
	Survey of Biology	X	
	Survey of Biology Lab	X	
Majors Biology	Biology I -Nature of Science, Chemistry, Cells, Energetics, Evolution		X
	Biology I Lab		X
	Biology II -Survey of Biodiversity, Ecology		X

	Biology II Lab		X
	Human Anatomy & Physiology I (Standard and Pre-Nursing/Pre-Med)	X	X
	Human Anatomy & Physiology I Lab (Standard and Pre-Nursing/Pre-Med)	X	X
	Human Anatomy & Physiology II (Standard and Pre-Nursing/Pre-Med)		X
	Human Anatomy & Physiology II Lab (Standard and Pre-Nursing/Pre-Med)		X
	Microbiology Lab		X
	Genetics Lab (Standard & Honors Level)		X
	Human Genetics Lab		X
	Science and Society	X	
	Physical Science	X	X
General/ Other Science	Physical Science Lab	X	X
	Introduction and Field Experience in Wildlife and Conservation Management	X	
Developmental Math	Beginning Algebra	X	
	Intermediate Algebra	X	X
General Math	Elements of Statistics	X	
Success and Support Courses	Introduction to College		X

Tertiary Experience - Education Courses

	<i>Course Name</i>	<i>Online</i>	<i>On-Ground</i>	<i>Field Experience</i>
Pedagogy	Foundations of Teaching and Learning (UTeach)		X	X
	Educational Psychology (UTeach)	X	X	X
	Assessment Methods and Strategies	X	X	
	Curriculum Development and Integration	X		
	Educational and Instructional Technologies		X	
Content	Project-Based Instruction in Mathematics and Science (UTeach)		X	X
	Life Science for Elementary Teachers	X	X	
	Science and Engineering in the Elementary Grades		X	
	Elementary STEM Instruction Methods		X	
Capstone Experience	Teaching Internship/Residency I	X		X
	Teaching Internship/Residency II	X		X

RESEARCH EXPERIENCE AND SUPPORTING ACTIVITIES

Iowa State University NSF Grant Team - Mentoring Network and Case Study Development

Grant Title: RCN:UBE Case-Based Active Science Education (CASE) Mentoring Network; NSF Award #2316317; Funding Amount: \$442,392.00

Roles:

- Grant Writing and Development Team - F22
- Group Mentor - AY24-25
- Executive Steering Committee Member - Sp24-present

Responsibilities:

- Training and coaching mentees in case study writing, development, and assessment; preparing them to be mentors in the subsequent cohorts.
- Serve as Member on Steering Committee

Supporting Activities:

Seipelt-Thiemann, R.L., Boury, N.M., Armstrong, P., Couch, B., Haynes, J., James, O., Kukday, S., **Grimes, Z.T.**, McCombs, A., & Peters, N. (12, January 2024). The Case-Based Active Science Education (CASE) Mentoring Network. Presented in the STEM Education Sessions of the 18th Annual Southeastern STEM Education Research Conference (S²ERC) at Middle Tennessee State University in Murfreesboro, TN.

Dissertation Research - STEM Anxiety, Teacher Education, Biology Anxiety, Biology Education

Role: Graduate Dissertation Student/Principal Investigator (F19-Sp21)

Supervisor/Dissertation Chair: Dr. Grant Gardner

MTSU IRB Protocol: 21-20097v

Responsibilities:

- Survey design and dissemination via Qualtrics
- Quantitative statistical analysis, qualitative analytical methods, and data management using R.

Supporting Activities:

Grimes, Z.T., & Gardner, G.E. (2023). Conceptions of Disciplinary Anxiety across Science, Technology, Engineering, and Mathematics (STEM) Contexts: A Critical and Theoretical Synthesis. *Journal of Research in Science, Mathematics, and Technology Education*, 6(SI), 21-46.
doi:10.31756/jrsmte.612SI

****Special note:** This paper was awarded 2nd place in the 2nd Special Issue of JRSMTE on graduate research. As voted on by the editorial board.

Grimes, Z.T. (2021). A Mixed-Method Evaluation of Anxiety Antecedents Related to Biology Content Among K-16 Educators. (Doctoral Dissertation, Middle Tennessee State University).

Grimes, Z. T., Reid, J.W., & Smith-Walters, C. (4, January 2019). Personification as a Reflective Tool to Examine Pre-Service Teachers' Attitudes Towards and Conceptions of Biology. Presentation at the International Association for Science Teacher Education in Savannah, GA.

**Middle Tennessee State University/Iowa State University NSF Grant Team -
Concept Inventory Development in Genetics**

Grant Title: Tools for Assessment in Genetics; NSF Award #1710277 (MTSU) and #1710262 (ISU); Combined Funding Amount: \$295,289.00

Roles:

- Graduate Research Assistant (AY17-18)
- Team Member (AY18-19)

Responsibilities:

- Manuscript Preparation
- Conducting and transcribing cognitive interviews
- Lexical Analysis of interviews.

Supporting Activities:

Grimes, Z.T., Boury, N.M., Wasendorf, C., McCombs, A.L., Reid, J.W., Couch, B., James, O., Armstrong, P.I., & Seipelt-Thiemann, R.L. An Assessment to Investigate Student Conceptions of Pedigree Analysis. (2022). The American Biology Teacher, 84(9), 535-544.
<https://doi.org/10.1525/abt.2022.84.9.535>

Wasendorf, C., Reid, J.W., Seipelt-Thiemann, R., **Grimes, Z.T.**, Couch, B., Peters, N.T., Sewall, J.M., McCombs, A.L., Armstrong, P.I., & Boury, N. (2022). The Development and Validation of the Mutation Criterion Referenced Assessment (MuCRA). Journal of Biological Education, ahead-of-print, 1-15. doi:10.1080/00219266.2022.2100451

Grimes, Z. T., & Reid, J. W. (23, November 2019). Common student misconceptions in genetics. Workshop presented at the annual Tennessee Science Teachers Association Meeting, Murfreesboro, TN.

James, O., Boury, N., **Grimes, Z. T.**, Reid, J. W., Wasendorf, C., Armstrong, P., Couch, B., & Seipelt-Thiemann, R. (7, April 2019). Investigating Undergraduate Student Misconceptions Regarding Pedigree Analysis. Poster Presented at the American Society for Biochemistry and Molecular Biology (ASBMB) 2019 national meeting in Orlando, FL.

Grimes, Z. T., Boury, N., Reid, J., Wasendorf, C., Armstrong, P., Couch, B., James, O., & Seipelt-Thiemann, R. (7, April 2019). Development of an Assessment Tool for Evaluating Undergraduate Student Understanding of Pedigree Analysis. Poster Presented at the American Society for Biochemistry and Molecular Biology (ASBMB) 2019 national meeting in Orlando, FL.

Couch, B. Seipelt-Thiemann, R., Reid, J., Wasendorf, C., Armstrong, P., **Grimes, Z.T.**, James, O., Peters, N., & Boury, N. (7, April 2019). Do Students' Misconceptions About Mutations Persist Throughout College Education? Poster Presented at the American Society for Biochemistry and Molecular Biology (ASBMB) 2019 national meeting in Orlando, FL.

Seipelt-Thiemann, R., Reid, J., **Grimes, Z. T.**, Wasendorf, C., Couch, B., James, O., Armstrong, P., Peters, N., & Boury, N. (7, April 2019). Undergraduate Students' (Mis)Understandings of Mutation. Poster Presented at the American Society for Biochemistry and Molecular Biology (ASBMB) 2019 national meeting in Orlando, FL.

Seipelt-Thiemann, R., Reid, J., & **Grimes, Z.T.** (24, January 2019). Undergraduate Students' (Mis)Understandings of Mutations. Invited talk presented as part of the Spring 2019 Mathematics and Science Education PhD Program Seminar Series.

Grimes, Z. T., Reid, J. W., Boury, N. K., and Seipelt-Thiemann, R. L. (2018). Misconceptions of Mutations and Pedigree Analysis Reveal Lack of Depth in and Reliance on Misplaced Intuition on Understanding. Poster presented at the MTSU Scholar's Week College of Basic and Applied Sciences Event and the University Wide Scholar's Week Event.

Reid, J.W., **Grimes, Z.T.**, Seipelt-Thiemann, R.L., & Boury, N. (February 2, 2018). Undergraduate biology students' misconceptions about mutations. Presentation at the TN STEM Education Research Conference, Murfreesboro, TN.

Grimes, Z.T., Reid, J. W., Seipelt-Thiemann, R.L., & Boury, N. (February 1, 2018). Undergraduate biology students' misconceptions about pedigrees. Presentation at the TN STEM Education Research Conference, Murfreesboro, TN.

Thesis Research - Bioinformatics, Molecular Biology, Cancer Genetics

Role: Graduate Thesis Student (F15-Su17)

Mentor/Thesis Chair: Dr. Rebecca Seipelt-Thiemann

Bioinformatic Analyses:

- Sequence retrieval from databases (Sanger Institute, gEVAL, National Center for Biotechnology Information (NCBI), and Mouse Genome Informatics (MGI)).
- Sequence analysis (Expasy Translate, Clustal Omega, BOXSHADE, Alggen PROMO, SMART, and InterProScan)
- Interactome analysis (MENTHA, STRING)
- Protein Modeling (PyMOL, Protein DataBank (PDB), Chimera, Quiagen Drug Discovery Workbench)

Laboratory Techniques:

- DNA Biotechnology (cloning, gel electrophoresis, transformation, PCR (standard, colony, and gradient), bacterial DNA isolation and precipitation).

- RNA Biotechnology (Reverse Transcription, RNA precipitation)
- Microbiological Methods (media preparation (standard and selective), isolation streaking, preparation of electrocompetent cells).

Supporting Activities:

Grimes, Z. T., Spear, BT., Peterson, ML., and Seipelt-Thiemann, R. (2017). Towards the Molecular Identification of Afr2, a Gene Implicated in Liver Cancer. Poster Presented at the American Society for Biochemistry and Molecular Biology (ASBMB) 2017 national meeting in Chicago, IL.

Grimes, Z. T., Spear, BT., Peterson, ML., and Seipelt-Thiemann, R. (2017). Towards the Molecular Identification of Afr2, a Gene Implicated in Liver Cancer. Poster presented at the MTSU Scholar's Week College of Basic and Applied Sciences Event and the University Wide Scholar's Week Event.

Grimes, Z. T., Spear, BT., Peterson, ML., and Seipelt-Thiemann, R. (2016). Towards the Molecular Identification of Afr2, a Gene Implicated in Liver Cancer. Poster presented at the MTSU Scholar's Week College of Basic and Applied Sciences Event and the University Wide Scholar's Week Event.

Undergraduate Research - Thermal Biology, Evolutionary Biology, Invasion Ecology

Role: Undergraduate Research Student (Sp15)

*project supported by internal MTSU Undergraduate Research and Creative Activity (URECA) Grant

Mentor(s): Dr. Robert Fischer, Melissa Pompilius

Responsibilities:

- Culturing, rearing, and isolation of *Daphnia lumholtzi*, an aquatic macroinvertebrate, in different environmental temperature conditions.
- Analysis of life history characters, including measurements of the core body and head and tail spines, number of offspring produced, number of resting eggs present, etc.
- Comparisons of somatic measurements across experimental and control populations

Supporting Activities:

Grimes, Z. T., Fann, S., Pompilius, M., and Fischer, R. (2015). Effects of Temperature on *Daphnia lumholtzi* Life History Traits. Poster presented at the MTSU Scholar's Week College of Basic and Applied Sciences Event and the University Wide Scholar's Week Event.

OTHER SCHOLARLY ACTIVITIES

Publications

Gardner, G.E., Brown, E., **Grimes, Z.T.**, & Bishara, G. (2021). Exploring Barriers to the Use of Evidence-Based Instructional Practices. *Journal of College Science Teaching* 51(2).

Workshops

Grimes, Z. T., & Reed, S. D. (3, November 2018). One potato, two potato, which weighs more? Workshop presented at the annual Tennessee Science Teachers Association Meeting, Murfreesboro, TN.

Napoleon-Fanis, V., & **Grimes, Z.T.** (2, November, 2018). Using games to teach biology. Workshop presented at the annual Tennessee Science Teachers Association Meeting, Murfreesboro, TN.

Lanfear, A.K., **Grimes, Z.T.**, & Smith-Walters, C. (29, May 2018). All the Write Stuff: Integrating Science, Literacy, and Technology. Presented at the annual Rutherford Works TechReady Conference, Smyrna, TN.

Napoleon-Fanis, V., **Grimes, Z. T.**, & Smith-Walters, C. (10, November 2017). Novel Assessment Ideas: Supporting K-12 Science, Mathematics, and Literacy. Presented at the annual Tennessee Science Teachers Association Meeting, Murfreesboro, TN.

SERVICE ACTIVITIES

Institutional and Programmatic Service

Crowley's Ridge College

- Academic Integrity Officer, F25-present
- Academic Assessment Committee, Member (AY21-22), Chair (F22-present)
- Academic Affairs Committee, Interim Member (Sp22, 10/2023-Sp24); Member (F24-present))
- Higher Learning Commission (HLC) Academy Team (F2022-Su2023)
- Curriculum Committee, Interim Member (Sp2022)

Middle Tennessee State University

- Mathematics and Science Education Program Student Coordination Committee, Secretary (AY17-18)
- Institutional Review Board, Student member (AY17-18)
- University Academic Appeals Committee, College of Basic and Applied Sciences Subcommittee, Student representative (AY14-15)
- University Grade Appeals Committee, College of Basic and Applied Sciences Subcommittee (AY14-15)
- University Academic Misconduct Committee, Student member (AY13-14)

Student Organizations Memberships

- MTSU Biology Education Association (2016-2021)
- MTSU Biology Graduate Student Association (2015-2021)
- National Society of Leadership and Success (2014-2015)
- Raiders for Christ Campus Ministry (2011-2015; Student President 2013-2014)

Professional Service

Other Memberships

- Arkansas Education Deans' Council (10/2023 – present)

Professional Organization Memberships

- American Scientific Affiliation (2023-present)
- American Society for Biochemistry and Molecular Biology (2016-present)
- Association of Biology Laboratory Educators (2017-present)
- Association for Mathematics Teacher Educators (2018-present)
- Association of Science Teacher Educators (2018-present)
- National Association of Biology Teachers (2017-present)
- National Association for Research in Science Teaching (2017-present)
- National Science Teachers Association (2017-present)

Reviewer Positions

- Member of the State Review Team for Educator Prep Programs (Sp24-present)
- Reviewer for The American Biology Teacher, Science and Children, Science Scope, Arkansas Association of Teacher Educators Journal
- Proposal Reviewer for the NSTA Regional Conference, National Harbor 2018
- Proposal Reviewer for the ASTE International Conference 2019
- Undergraduate Poster Judge for MTSU University Wide Scholars' Week 2018, 2019