Aaron Wenger

Graduate Student
Kalamazoo, Michigan
aaron.wenger@protonmail.com | ace-wenger

I am a Ph.D. candidate in the Mallinson Institute of Science Education program. I have a passion for 1) teaching and learning at all levels and subjects, particularly biology in higher education and 2) the role and nature of evidence for decisions in education. Example work can be found on my Github page in the 'Portfolio' repository.

Education

Western Michigan University
Kalamazoo, Michigan

Ph.D. Student in Science Education
2017-present

- Ph.D. candidate, currently completing dissertation project with a defense planned for summer 2024
- Advised and chaired by Dr. William Cobern

Projects/Manuscripts in Progress (Working Titles)

- Dissertation: Beyond Average Effects in Education Research: Explaining heterogeneity of concept mapping research in science education through meta-regression modeling
  - **Article 1:** Challenges and Solutions for Knowledge Accumulation in Science Education Research
  - **Article 2:** Concept Mapping in Biology Education: *A Systematic Review and Meta-Analysis*
  - **Article 3:** Explaining Heterogeneity in Science Education Research: *Comparing machine learning models with a priori meta-regression models*
- Mapping the Homeschooling Literature: *A Scoping Review and Source Analysis*

Western Michigan University
Kalamazoo, Michigan

M.A. in Biological Sciences
2017-2021

- Master's Thesis Project: Engineered Flagellin Disulfide Variants in Salmonella typhimurium
- Advised by Dr. Brian Tripp

Cornerstone University
Grand Rapids, Michigan

B.S. in Biology-Health Sciences - minors in Chemistry, Ancient (History) Studies
2011-2015

- Recipient of the Ronald Meyer Academic Scholar, Dean's list (6 of 7 semesters), and President's Scholarship
- Senior Thesis Project: a meta-study of the neural crest as a mechanism for vertebrate phenotypic diversity
- Internship: Hesse Memorial Archaelogical Laboratory, learned and applied zooarcheological techniques with animal bone remains

Teaching Experience

Western Michigan University
Kalamazoo, Michigan

Teaching Assistant
2017-2021

- Instructor of record for lecture/lab science content courses for elementary education majors
- CHEM 2800: Physical Science for Elementary Educators: a inquiry-based, activity-centered course covering basic chemical and physical science principles
- BIOS 1700 in-person: Life Science for Non-Majors: a laboratory-lecture-based content course covering major topics in the life sciences
- BIOS 1700 virtual: An adaptation of BIOS 1700 to an online synchronous format, for which I was responsible to design and implement
- GEOG 1900: Exploring Earth Science, the Atmosphere: A laboratory-based course covering basic earth science principles with an emphasis on the atmosphere; taught as a virtual, partially synchronous course

Lecturer for Pre-Med Intiative
2018

- A student-led program for MCAT exam preparation

Friday Addition (FA) and Homeschool Ancillary Program (HsAP)
Michigan

Science Teacher
2015-2017

- Developed and taught 9th grade biology, 7th grade general science, and 10th grade chemistry.

Cornerstone University

Grand Rapids, Michigan

College Tutor and Laboratory Assistant

2012-2015

- Tutored undergraduate genetics, chemistry, physics, math, and history
- Assisted in stockroom, ordering materials, organizing activities, and grading laboratory reports

Areas of Expertise for Teaching and Public Engagement

- 1) Scientific methods, experimental design, causal inference, and philosophy of science
- 2) Introductory and advanced biology subjects, particularly microbiology and molecular biology
- 3) History of educational psychology and science education
- 4) Statistical and computational research methods using R, especially computational reproducibility

Research Experience

Research Interests

- 1) Meta-research methods, especially meta-analysis and bibliometrics
- 2) Computational reproducibility and open science practices
- 3) Role of evidence in educational policy and practice

Western Michigan University

Kalamazoo, MI

Graduate Research Assistant in Science And Mathematics Program Improvement (SAMPI)

2021-2023

- Assisted in program evaluation for clients including NSF-funded Professional development for Emerging Education Researchers (PEER) field school, Kalamazoo Scholars Program, and the Michigan STEM Network (MiSTEM
- Created protocols and evaluation tools (e.g., Qualtric surveys and interview questions)
- Conducted quantitative and qualitative analysis of numerical, ordinal, and textual data
- Wrote internal and external reports summarizing findings

Portfolio and Further Education

Software for Statistics and Data Science

R: substantial programming experience with base R, the Rstudio IDE, and common packages such as 'ggplot' (See *ConceptMapping-inBioEd*)

Git and GitHub: substantial experience creating and mangaging projects using Git version control and the GitHub collaboration platform (See my GitHub account for several public projects)

Analysis Pipeline Tools: substantial experience implementing data analysis pipelines with the 'targets' and 'renv' R packages (See *ConceptMapping-inBioEd*)

SPSS and SAS: minor programming experience with both (See *Portfolio/sas*)

Excel VBA: minor programming experience (See *Portfolio/vba*)

Software for Documentation and Reporting

Microsoft Office Suite: extensive experience with Word, PowerPoint, Excel, Outlook, and Teams

Quarto: substantial experience creating reports and presentations

Rmarkdown: substantial experience creating data analysis notebooks, reports, and other documents such as this CV

LaTeX: minor working experience using the TeXworks IDE such as in this CV

Other Software

Qualtrics: substantial experience in creating survey forms, distributing to program participants, and processing results

Google Forms: substantial experience in creating survey forms and processing results

Abstrackr and MetaReviewer: substantial experience in these platforms for meta-research studies

Workshops and Online Courses

2023	**Instats: Confirmatory factor analysis and structural equation modeling in R**: Taught by Michael Zyphur and with certificate of completion
2023	**Instats: Meta-analytic structural equation modeling**: Taught by Mike Cheung and with certificate of completion
2023	**Evidence Synthesis and Meta-Analysis in R (ESMAR) Conference**: several workshops including: Advanced GitHub, Screening studies for eligibility in evidence syntheses
2022	**Excel VBA Programming**: video course introducing VBA programming and various applications such as macro implementation, userforms, and webscraping
2022	**Research Transparency Online Course**: put on by the Berkeley Initiative for Transparency in the Social Sciences (BITSS)
2022	**Reproducible Research Tutorial Series**: online course by Dr. Schloss of the University of Michigan, supported by NIH
2022	**Instats: Path analysis with interactions and indirect effects in R**: Taught by Michael Zyphur
2021	**Bibliometrics Training Series**: put on by the NIH Library
2020-21	**AERA-ICPSR PEERS**: attended several in this workshop series including: Modern Meta-analysis, Cutting-edge Quatitative and Computational Methods for STEM Education, and Introduction to qualitative meta-synthesis methods
2020	**Introduction to Systematic Reivew and Meta-Analysis**: a John Hopkins University course hosted by Coursera

Grants and Professional Experience/Service

2024	**Graduate Student Panel Reviewer** Reviewed five papers each for Division D (Measurement & Research Methodologies) and SIG-SRMA (Systematic Review and Meta-Analysis special interest group)	*AERA Annual Meeting*
2021	**Graduate Student Research Grant** Secured for Science Education Research Project	*Western Michigan University*
2019	**Graduate Student Research Grant** Institutional grant secured for biology master thesis project	*Western Michigan University*

Presentations and Publications

1. Wenger, A., & Cobern, W. (2023). *Replication of concept mapping research in biology education: A systematic review and meta-analysis.* [Conference]. Michigan Academy of Science Arts and Letters Annual Conference, Berrien Springs, Michigan. `https://ace-wenger.quarto.pub/masal23-concept-mapping/`
2. Williams, C., & Wenger, A. (2023). *Evaluating the effects of field schools on emerging STEM education researchers.* [Conference]. Michigan Academy of Science Arts and Letters Annual Conference, Berrien Springs, Michigan.