Chelsi R. Miller

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Education

Northwestern University Sep 2025
Master of Science in Education, Learning Sciences and Technologies GPA: 3.9/4.0

The University of the Arts Jun 2023
Bachelor of Science in Music Business, Entrepreneurship, and Technology GPA: 3.9/4.0
Honors: Magna Cum Laude; 2023 DEIA Thesis Fellow; Deans' List 2021-2023

Olympic College Jun 2021
Associate of Arts GPA: 3.24/4.0
Honors: Deans' List 2020; President's List 2021

Publications

Miller, C. R., Roberts, C. L., Horn, M. S. (2026). "Coding Music Together: How Elementary Computer Science Students Collaboratively Translate Musical Ideas into Code." *American Educational Research Association (AERA 2026)*.

Roberts, C. L., **Miller, C. R.,** Horn, M. S. (under review). "MusicLogo 2.0: A New Computational Representation for Music Learning." *International Society of the Learning Sciences (ISLS 2026)*.

Research Experience

Research Intern | *TIDAL Lab* Jan 2025-Present

- Designed and executed a 10-week multimodal ethnographic study in a fifth-grade computer science classroom, collecting field notes and administering surveys to examine student collaboration and engagement with music+code software; data collection contributed to multiple research projects and a peer-reviewed publication.
- Assisted with coordination of logistics and operations for multiple music+coding showcase competitions, assisting with event setup, facilitating campus tours for fifth-grade participants, and supporting students in presenting their computational music compositions to live audiences and judging panels.
- *Research project:* Employed constructivist grounded theory analysis of ethnographic field notes to identify factors and dynamics that influenced successful and unsuccessful student collaboration in computational music creation, contributing theoretical insights on collaborative learning dynamics in creative coding environments.
- *Research project:* Conducted qualitative analysis using practice-linked identity framework for research paper on collaborative interface design in CS education, co-developed codebook to establish inter-rater reliability across research team and authored analytical vignettes that illustrated key findings.
- *Research project:* Collected ethnographic field notes on 8 middle school students' integration of generative AI suggestions into computational music creation. Conducted multimodal analysis of field observations, video data, and interaction logs to examine how learners incorporated AI tools within their creative coding practices.

Graduate Project Lead | *TunePad Groove Garden*

- Co-designed pedagogically grounded redesign of TunePad (music+code learning platform) interface in collaboration with learning sciences professors and children's app-developer, applying constructionist frameworks to create accessible, developmentally appropriate tools for young learners' exploration of computational music-making.
- Executed usability research with approximately 50 child participants, employing think-aloud protocols and interaction analysis to identify usability barriers and translate findings into evidence-based design improvements that increased engagement and learning comprehension.

Graduate Research Volunteer | *Northwestern's Office of Community Education Partnerships* Oct 2025–Nov 2025

- Analyzed 500+ community survey responses regarding school closure scenarios using Excel-based demographic segmentation and cross-tabulation, developed standardized codebook for multi-analyst consistency, and co-authored comprehensive report presenting findings to local K-8 district and school board.

Research Vounteer | *AnitaB.org, Responsible AI Forum* Mar 2025-Dec 2025

Responsible AI By Design, Not for Compliance

- Supported research for a published white paper in collaboration with senior researchers by conducting qualitative field research. Captured ethnographic observations from multiple roundtable discussions with 8-15 AI stakeholders, contributing to analysis that informed ethical guidelines and regulatory considerations for LLMs.

Master's Thesis| *Northwestern University* Sep 2024-Jun 2025

Exploring the Cognitive and Affective Landscape of Computational Music-Making

- Examined the role of distributed cognition and affective engagement in a collaborative, software-based learning environment with 12 students to investigate how the integration of computer science and music education can address systemic inequities in access and participation.
- Analyzed IRB-approved ethnographic field notes and student survey responses to investigate students' emotional experiences, peer collaboration dynamics, and interdisciplinary engagement during computational music-making.

Understanding Predictors in Keystone Exams | *QUANT410 Descriptive Data Project* Sep 2024- Dec 2024

- Conducted descriptive statistical analysis examining relationship between student attendance patterns and proficiency rates on 11th grade Keystone Exams (Pennsylvania standardized assessments) across three academic years, investigating whether four-year cohort graduation rates and percentage of students attending more than 90% of instructional days predict academic outcomes.
- Performed correlation and linear regression analyses using STATA to model predictive relationships between attendance metrics and exam proficiency, creating data visualizations to communicate findings on educational equity and attendance policy implications.

Digital Technology in Music Education Lit Review | *LRNSCI403 Annotated Bibliography* Sep 2024-Dec 2024

- Reviewed 25 empirical and theoretical articles examining digital technology's impact on music education philosophy, pedagogy, and curriculum. Traced historical development from analog to digital tools and analyzed impact on music educator identities and instructional practices.
- Synthesized scholarship revealing the philosophical and practical challenges of integrating digital technology beyond tool adoption, including implications for redefining musical literacy, creativity, and participation in technology-rich learning environments.
- Findings informed master's thesis research on computational music-making and equity, establishing theoretical foundation for understanding technology as a vehicle for democratizing music education access.

Teaching Experience

AmeriCorps College Access Coach | *College Possible* Jun 2023–Aug 2024

- Designed and facilitated comprehensive college readiness curriculum featuring weekly workshops, 1:1 personalized coaching, essay development support, and financial aid literacy programming for 60+ junior and senior high school students, resulting in measurable improvements in college application completion rates.
- Achieved 100% college acceptance rate for cohort of 25 graduating seniors, securing admission to 2-year and 4-year institutions, and collectively earning over $800,000 in scholarships and financial aid.
- Expanded program reach by strengthening partnership with a Philadelphia high school, developing targeted outreach strategies, and launching tailored programming that drove 120% increase in student enrollment within year.

Founding Music Teacher | *Overture Games* Jun 2025-Present

- Taught an interdisciplinary music+STEM curriculum across three elementary schools, exploring foundational concepts of musicianship through interactive digital games. Employed formative assessment and student feedback to refine game-based pedagogical strategies that fostered creative expression and musical understanding.

AMPED Volunteer | *Center for Civic Engagement at Northwestern University* Jan 2025-May 2025

- Facilitated weekly digital music production workshops for youth in Chicago detention center with *Arts and Music Programs for Education in Detention Centers*. Mentored students in songwriting and collaboratively producing original compositions that were shared with families and community members.

Digital Music Instructor | *IdTech* Jan 2023-Jun 2023

- Developed digital music production courses for remote synchronous instruction across diverse age groups, employing industry standard digital audio workstations (e.g., Ableton Live, Logic Pro), and adapting pedagogical approaches based on continuous assessment of student learning outcomes and technological proficiency.

Assistant Preschool Teacher | *Lisa's Learning Ladder* Jan 2017-Aug 2017

- Collaborated with lead teacher to design and implement developmentally appropriate lesson plans and learning activities for classroom of 10-20 preschool-aged children (ages 3-5), supporting early literacy, numeracy, social-emotional development, and fine/gross motor skill acquisition through play-based learning experiences.

Industry Experience

UI/UX Research & Design Intern | *Next Play Games* Aug 2025-Nov 2025

- Conducted user research and needs assessment for educational technology platform, synthesizing qualitative data into evidence-based user personas and translating findings into design specifications for parent-facing dashboard and onboarding experience that addressed identified barriers to engagement.
- Performed mixed-methods usability evaluation combining qualitative user testing with quantitative analysis of survey data, applying inferential statistical methods (t-tests, ANOVA) to assess intervention effects and inform iterative design decisions.

Music Intern | *ESPN* Jun 2022–Aug 2022

- Curated licensed music from ESPN catalog for production teams, conducting targeted searches and delivering tracks for linear broadcasts and digital streaming content across sports programming.
- Architected metadata framework for ESPN music catalog comprising of thousands of tracks, establishing categorization standards and documentation to support migration to new digital asset management system.

Music Rights and Content Operations Intern | *Studio 71* Jan 2022–Apr 2022

- Administered YouTube Content Management System for artist catalogs, auditing and correcting music composition and sound recording rights metadata to resolve ownership disputes and optimize content monetization, achieving 800% increase in average artists monthly revenue through accurate rights management.

Childcare Provider/Household Manager | *Self-Employed* Jan 2017–Aug 2021

- Delivered childcare and educational support across diverse settings including traditional nanny roles, au pair placement with English language instruction responsibilities, and emergency remote learning facilitation during COVID-19 school closures.
- Provided full-time childcare for children ages 6mo-12yrs across multiple families, including meal preparation, age-appropriate educational activity planning, behavior guidance, and facilitating social-emotional development through play-based learning and conflict resolution support.
- Managed household operations including maintenance coordination, budget tracking, staff hiring and oversight, and implementation of organizational systems, while building trust-based relationships that resulted in long-term placements and family referrals.

Selected Projects

Resources for Inclusive Student Education App | *IMC535 *Integrated Marketing Communication* Jun 2025-Aug 2025

- Led user research with 10 parents & educators to identify pain points in Individualized Education Plans (IEP).
- Developed a detailed PRD including EPICs, success metrics, and a 0-to-1 plan to guide development of a document-sharing and communication platform for families and educators; Integrated AI-powered recommendations to surface personalized resources and next steps for families navigating neurodiverse child's educational plan.
- Created mid- and high-fidelity wireframes in Figma and led usability walkthroughs to validate core features.

Engineering Game Prototype | *LRNSCI301 *Design of Learning Environments* Mar 2025-May 2025

- Co-designed educational game prototype targeting Next Generation Science Standards (NGSS 3-5-ETS1: Engineering Design), creating both digital and physical game versions where players engage in authentic engineering practices by generating and comparing multiple solutions to design challenges with specific criteria and constraints.
- Led iterative design and playtesting process, analyzing player interactions, and learning behaviors to refine game mechanics, rule structures, and feedback systems that effectively scaffold elementary students' understanding of constraint-based problem solving and solution evaluation.

Undergraduate Thesis | *The University of the Arts* Sep 2022-Jun 2023

The Presence and Importance of Music Technology in U.S. Public Schools' Music Education Curricula
DEIA Thesis Fellowship Award Recipient, 2023

- Investigated the potential of music technology education as an accessible alternative to traditional ensemble-based music programs, examining how Digital Audio Workstations (DAWs) and MIDI-based instruction can expand access to music learning for the 80% of middle and high school students not participating in conventional music education.

- Employed literature review and policy analysis to evaluate how technology-centered music pedagogy aligns with National Core Music Standards and addresses systemic barriers to music education participation.

MuTech Digital App | *The University of the Arts* Sep 2022-Jun 2023

- Conceptualized and designed *MuTech*, a collaborative tablet application for music learning featuring: (1) intuitive DAW interface for composition and production, (2) scaffold music theory instruction modules, and (3) social sharing functionality enabling students to remix and build upon peers' creative work, fostering distributed creativity and peer learning; Based on research done for undergraduate thesis paper.
- Developed complete wireframe prototype in collaboration with graphic designer, detailing user interface, navigation flow, and pedagogical framework aligned with NAfME standards and constructionist learning principles.

Producer of Music Tech Education Podcast | *Personal Project* Jan 2022-May 2022

- Researched case studies regarding Music Technology Education in American public schools.
- Conducted voice recording and edited the audio clips in Logic Pro X; Editing consisted of removing unwanted noises, corrective EQ, applied compression, and background music.

Audio Programming Project | *Audio Programming at The University of the Arts* Sep 2021-Jan 2022

- Utilized multimedia programming, Max/MSP, to synthesize and manipulate audio in creative ways.
- Designed and programmed a digital user interface instrument that included polyphonic components, sequencers, bandpass filters, and comb filtering. The interface ultimately allowed the user to insert tracks and manipulate them to create unique musical pieces.

Studio Recording Session(s) | *The University of the Arts* Oct 2021-Jun 2023

- Set up microphones on various instruments (i.e., drum set, electric guitar, bass guitar, vocal) for recorded live performances; utilized signal flow for an API Analog console and AVID Pro Tools; and implemented Lexicon reverb/EQ/Compression

Leadership

Founder of UArts Music Alliance Jan 2022-Jun 2023

- Established and spearheaded an influential organization dedicated to fostering connections and support networks for women and non-binary individuals within the music industry, providing a platform for empowerment and advocacy for over 50 students and alumni.
- Collaborated with UArts Diversity, Equity, Inclusion, and Accessibility committee to organize and facilitate multiple alumni workshops, amplifying women's voices, and perspectives in the music industry, and promoting diversity and inclusion initiatives campus wide.

Skills & Certifications

Certifications: Human Research Protections (IRB) Basic, CITI Program (Issued: Oct 2024)

Research Methods & Analysis: Qualitative Methods (interviews, ethnography, observations, discourse/interaction analysis, grounded theory, thematic analysis), Quantitative Methods (statistical analysis, survey design, experimental design), Mix methods Research Design, Usability Testing
Pedagogical & Educational: Curriculum Design and Assessment, Instructional Design Frameworks (UDL, constructionism), Classroom Management, Educational Technology Integration
Software & Tools: Figma, Canva, Adobe Creative Suite, Python (novice), Microsoft 365, Google Workspace, Salesforce, Notion, Stata, MAXQDA, Dedoose
Music Technology: ProTools, Adobe Audition, Logic Pro X, Ableton Live 11, API analog mixing console, MAX/MSP