

Tene Ariyo

Topic of Capstone Project

My project, “*R for Everyone: Teaching Data and Coding Literacy Through Interactive R Lessons for Middle School Students*,” aims to design short, beginner-friendly tutorials that introduce students ages 11–14 to essential concepts in data science and programming using R. These lessons will be built with tools like learnr or bookdown, and will include interactive quizzes, visualizations, and relatable datasets. Each module will be structured around the “Big Ideas”¹ for teaching data science to middle schoolers: (1) formulating statistical questions, (2) considering how data is collected, (3) analyzing data through simple code and visuals, and (4) interpreting and communicating results in plain language.

The lessons will also incorporate data ethics and justice themes such as permission, confidentiality, and bias in accessible ways that align with students’ classroom settings. On the technical side, students will be guided through basic data cleaning and visualization tasks that reflect the full data journey, while I apply more advanced data storytelling and interactive design principles to scaffold that learning. The goal is to create a set of engaging, low-barrier lessons that address common beginner challenges (e.g., syntax confusion or low confidence) while also introducing foundational ideas of ethical and responsible data use. I’m currently identifying relevant education research to further refine the scope and ensure the project is both pedagogically grounded and practically usable.

¹ Adapted from Bargagliotti et al. (2020), *Pre-K–12 Guidelines for Assessment and Instruction in Statistics Education II (GAISE II)*, with modifications by the Stanford Graduate School of Education. [Link](#)