



Researching Promise in the Midst of Heterogeneity and Mobility

Background and Context

The [Adult Numeracy in the Digital Era \(ANDE\)](#) project set out to evaluate a technology-enhanced numeracy course across multiple sites in Pennsylvania. ANDE is a technology-enhanced, standards-aligned adult numeracy course and accompanying professional development package of supports for building classroom community, productive mindsets, and effective learning habits.



The project was implemented in partnership with the Pennsylvania Department of Education (PDE), with testing and refinement occurring across a variety of adult basic education (ABE) programs and sites throughout the state. These settings include urban, rural, hybrid, fully online, and in-person instructional environments, reflecting the diverse contexts in which adult education operates. The project employed a mixed-methods approach. Data sources included classroom observations, interviews with instructors and learners, user-centered design (UCD) workshops, and platform usage logs. Originally designed as a cluster randomized controlled trial, the study evolved into a quasi-experimental design as the team realized the extent to which high mobility and heterogeneity in ABE settings would complicate traditional research methods.

The Challenge of Research Design in ABE

Conducting rigorous research in ABE is not the same as in K–12 or higher education. Adult learners participate voluntarily, often balancing education with work, family, and health responsibilities. Attendance is therefore unpredictable, with students joining courses midstream, leaving for new job opportunities, or returning after long absences. Programs are designed to accommodate this type of participation through rolling admissions, but for researchers, this mobility may undermine the stability required by conventional, experimental designs.

Commented [1]: Should this be "experimental"?



In addition to mobility, heterogeneity across ABE sites further complicates research. Learners vary widely in English proficiency, reading comprehension, math backgrounds, and experiences with learning disabilities. Programs differ in size, mission, and setting, ranging from community colleges to correctional institutions to small rural centers. Instructors differ in their training, technology access, and pedagogical approaches. These differences mean that what counts as “good numeracy instruction” in one context may need to be adapted heavily in another. For the ANDE team, it became clear that a rigid randomized design would quickly collapse under these conditions, threatening both feasibility and validity.

Pivoting to a Quasi-Experimental Design

In response, the team shifted from a randomized trial to a quasi-experimental design that allowed for greater flexibility. Instructors were matched across treatment and comparison conditions along dimensions such as location, modality, and course type. This approach reduced concerns about attrition undermining random assignment while still enabling meaningful comparisons. To further strengthen the design, the team implemented the study across two cohorts, spring and fall 2025, which improved statistical power in light of small class sizes common in ABE.

The quasi-experimental design was not without challenges like budget cuts and staffing changes which created unanticipated imbalances between groups. Nevertheless, this study design better balanced methodological rigor with the realities of ABE contexts. By privileging feasibility and responsiveness, the design accommodated real-world constraints while preserving the ability to examine promise.

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Building Flexibility into Implementation and Data Collection

Another adjustment involved shifting away from rigid, standardized assessment schedules. Instead, the team developed flexible data collection protocols tailored to each site’s instructional rhythms. Instructors were consulted about their pacing, and assessments were scheduled at points aligned with course milestones rather than fixed calendar windows. This flexibility respected the open-entry/open-exit model of many ABE programs while still generating meaningful data.

Collaboration with the Pennsylvania Department of Education (PDE) was central to this work. PDE staff not only facilitated relationships with local programs but also modified their data systems to better track learner mobility and hosted webinars to train agencies in reporting practices. At the classroom level, simple protocols were developed to help instructors orient new students and administer baseline assessments even when learners joined mid-course.

Expanding the Definition of Promise

Finally, the ANDE team broadened their conception of what it means to evaluate the “promise” of an intervention. Instead of relying solely on pre-post measures of learner outcomes, they collected data aligned with the project’s logic model, including instructor fidelity, learner engagement, and motivational shifts. For example, exit tickets captured learners’ reflections on their engagement in mathematical discourse, a key practice tied to conceptual

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understanding. Results suggested that discourse was happening in most classes, though with variation across sites, highlighting the need for longer-term professional development. The team also measured changes in learners' motivation and self-efficacy, acknowledging that persistence and confidence are critical precursors to long-term learning gains.

Outcomes and Lessons Learned

Through these adaptations, the ANDE project demonstrated that methodological rigor is possible in ABE research, but only when researchers acknowledge and adapt to mobility and heterogeneity rather than treating them as errors to be eliminated. By embracing flexible designs, engaging closely with administrators, and adopting a multi-faceted view of promise, the project was able to generate meaningful, context-sensitive evidence of ANDE's potential.

Key Takeaways

The ANDE evaluation illustrates that early coordination with administrative staff is essential for understanding contextual variability and designing viable studies. In settings where mobility and heterogeneity are the norm, researchers must build flexibility into both implementation and data collection. Evaluating promise in ABE requires looking beyond immediate learner outcomes to include evidence of implementation quality, learner engagement, and motivational shifts—all of which contribute to sustained impact.