Tier 4: Using Evidence to Demonstrate a Rationale for Educational Technology Use

Leveraging and Building Evidence to Guide School Implementation

Building evidence that meets Tier 4

The Elementary and Secondary Education Act of 1965 (ESEA) encourages state and local educational agencies to prioritize **evidence-based interventions**, strategies, and approaches. Under ESEA, there are four tiers of evidence: *(1) Strong Evidence*, *(2) Moderate Evidence*, *(3) Promising Evidence*, and *(4) Demonstrating a Rationale*. The Department has defined those terms for use in ESEA and other programs in its regulations (see 34 CFR 77.1). At the *Demonstrating a Rationale*[1] tier, education practices have a well-defined **logic model**, are supported by prior research with positive findings, and have efforts underway by an education agency or outside **evaluation organization** to determine their effectiveness.

Key Evidence Terms

- **Evidence-based:** To be based on research demonstrating improved outcomes
- **Intervention:** A set of practices/tools meant to produce specific outcomes or results
- **Evaluation organization:** A government entity, university, non-profit agency, or private agency qualified to perform education evaluation and research
- **Evaluation:** The inspection of available information concerning a program or intervention to identify change in outcomes
- **Literature review:** A comprehensive summary/analysis of current research and data on a topic, program, or intervention
- **Logic model:** A narrative or graphic description of how project components are associated with relevant outcomes
- **Pilot test:** A small-scale, short-term, effort designed to provide data on whether a program or intervention is feasible and useful
- **User feedback:** Information collected from users about their experiences engaging a program or intervention

Tier 4 and educational technology use in schools

As a starting point for using evidence to inform the use of educational technologies in schools, approaches to building Tier 4 evidence can include partnering with internal and external education evaluation organizations to:

- conduct a **literature review** to identify any existing evidence describing the impact and use of the educational technology
- develop a **logic model** outlining the rationale for the use of educational technology, its components/activities, and its relationship to relevant outcomes
- **pilot test** the use of the educational technology with a small group of users at a school or district level using the logic model as a guide
- gather **user feedback** - such as a survey, activity log, or assessment data - to identify outcomes associated with the use of educational technology during pilot test
- use insights gained from the pilot test and user feedback to build, or plan for building, more rigorous evidence (e.g., Promising Tier 3 evidence) in support of the educational technology program or intervention

[1] For full definitions in the Education Department General Administrative Regulations of key terms, please visit https://www.ecfr.gov/current/title-34/part-77

Case Study: Putting Tier 4 into Action

A school district is interested in identifying educational technology tools to support 3rd-6th graders' positive science identity development during class time. The school districts' technology team has been tasked with conducting an initial needs analysis consisting of (1) asking teachers about educational technologies they've considered using with their students, and (2) collaborating with internal and external education evaluation partners to identify what – if any – evidence or research exists on the use of proposed educational technologies to improve relevant student outcomes.

Your turn! If this example was in your school or district, what evidence-building activities would you consider as you make decisions about adopting the educational technology intervention?

The school district technology team's needs analysis identified a promising new science app, supported by teacher feedback that students using the app demonstrated positive science identity development and emerging research findings positively relating students' science identities with future science trajectories. However, no rigorous evidence regarding the app's relationship to student outcomes could be found. After ensuring that the proposed app will be used in compliance with student privacy laws, the team collaborated with internal and external evaluation partners to develop a logic model outlining the rationale, activities, and outcomes associated with integrating the new science app intervention into classroom practice. Given the lack of rigorous evidence for the new app, the school district decided to build evidence consistent with Tier 4; that is, that the intervention *Demonstrated a Rationale*:

Logic Model for a Science App Intervention

Problem Statement: Emerging research suggests students' science identities positively relate to future science trajectories; however, students have limited access to interventions supporting positive science identity development.

Resources	Activities	Outputs	Short & Medium Term Outcomes	Long Term Outcomes
What resources are available?	What will the activities be?	What are the results of these activities?	What changes are desired?	What outcomes are expected long term?
• ESEA Title funds • Partnership with external research organization	• Pilot test intervention in select classrooms • Survey participants • Develop teacher PD	• Use intervention in 4 classrooms • Deliver 2 teacher PD intervention workshops	• Students' science identity increases • Teachers report increase in science engagement	• Student science identity gains • Evidence based EdTech adoption

The school district's implementation plan included pilot testing and survey dissemination. Pilot testing would consist of 4 early adopter classrooms (100 students total) using the intervention in their classroom 3 times per week over a span of 8 weeks. To monitor science identity development, they would keep a log of science activities completed using the intervention and compare that to the number of activities completed before the intervention was adopted. Surveys would include pre/post student and teacher questionnaires to explore changes in student science identity before and after intervention adoption.

Your turn! Consider an educational technology tool you are interested in implementing. What would related research, a logic model, and a plan for evidence-building look like? What kinds of participant data would help you determine whether to pursue adoption?

Pilot testing revealed that teachers found the app easy to implement, and it was used by students as expected. Student outcomes also improved from the pre-test to the post-test. With support from internal and external partners, the district technology team used initial pilot test results to develop a plan that would expand the use of the intervention to more schools within the district, and that could build more rigorous evidence about the app's promise to improve student outcomes.