Basic Elements of High-Quality Research: What to Look for in a Research Study

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Please keep your microphone muted unless otherwise directed.

Click the ^ next to the microphone icon to start or change your audio connection.

This will provide a chat window on the right side of the screen. Please post questions here and the speaker will address them when possible.
Ten RELs work in partnership with LEAs, SEAs, and others to use data and research to improve academic outcomes for students.
Regional Educational Laboratories (RELs): Three Main Activities

✔ Conduct applied research

✔ Facilitate the flow of actionable, credible, up-to-date research evidence

✔ Provide technical support around data collection, evidence use, and research
Session Goals

The goals are that participants will increase their understanding of:

• How to identify high-quality research; and
• How to use the *Basics of Reviewing a Research Study* infographic to evaluate research
Basics of Reviewing a Research Study

The Basics of Reviewing A Research Study

Purpose
This quick-reference guide will provide you with some basic elements of high-quality research to inform your selection of evidence-based interventions. It provides considerations under four main topics when you are reviewing an individual study that tests the effectiveness of an intervention:

- Study Source: Where the research comes from.
- Study Design: How the study was designed and carried out.
- Study Findings: The measures of the intervention’s effectiveness and strength.
- Study Relevance: How the research may apply to your context.

Intended Use
This guide is intended to help state education agency, school district, and school staff review research studies to identify high-quality evidence-based interventions that meet their needs. These are some basic considerations when reviewing research studies, but this is not an exhaustive list.

The guide provides, for each topic area, the elements to look for in a study, questions to ask about each element, why it matters to consider each element, implications, and resources.
Basics of Reviewing a Research Study

- **Study Source**: Where the research comes from
- **Study Design**: How the study was designed and carried out
- **Study Findings**: The measures of the intervention’s effectiveness and strength
- **Study Relevance**: How the research may apply to your context

https://ies.ed.gov/ncee/edLabs/regions/west/Publications/Details/300
Consideration: Study Source

- Credibility
- Peer Review
- Independent Researchers

**CONFIDENCE IN STUDY’S CREDIBILITY**

- Less confidence
  - Study not from a credible source
  - Not peer reviewed
  - Researcher developed the intervention

- More confidence
  - Study from a credible source
  - Peer reviewed
  - Researcher was independent from intervention development
Credible Sources (1)

[Logos for IES: WWC, ERIC, Evidence for ESSA, and Campbell Collaboration]

https://ies.ed.gov/ncee/wwc/

eric.ed.gov

evidenceforessa.org

campbellcollaboration.org
Credible Sources (2)

https://bestpracticesclearinghouse.ed.gov/

https://intensiveintervention.org/

https://www.rand.org/pubs/research_reports/RR2133.html
Considerations: Study Design

- Study Design
- Baseline Equivalency
- Sample
- Outcome Measures

**CONFIDENCE IN STUDY’S DESIGN**

<table>
<thead>
<tr>
<th>Less confidence</th>
<th>More confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak research design</td>
<td>Stronger research design</td>
</tr>
<tr>
<td>No comparison group</td>
<td>Use of a comparison group</td>
</tr>
<tr>
<td>Smaller sample</td>
<td>Larger sample</td>
</tr>
<tr>
<td>Many study participants drop out of the study</td>
<td>Few study participants drop out of the study</td>
</tr>
<tr>
<td>Use of an outcomes measure designed by the developer</td>
<td>Use of an established outcome measure not designed by the developer</td>
</tr>
<tr>
<td>None of the outcomes measured are relevant to the intervention</td>
<td>At least one of the outcomes measured is relevant to the intervention</td>
</tr>
</tbody>
</table>
Consideration: Study Design

Research Design

- Experimental (RCT)
- Quasi-experimental
- Correlational
- Descriptive
Refresher on ESSA Evidence Levels

- **Experimental Study**: Strong evidence
- **Quasi-Experimental Study**: Moderate evidence
- **Correlational Study**: Promising evidence
- **Positive evaluation**: Demonstrates a rationale

Statistically significant results on relevant outcomes
Likely to improve relevant outcomes
Consideration: Study Design

Baseline Equivalency

Comparing the groups on meaningful dimensions before one group received the intervention

Necessary for Quasi-Experimental Designs
Consideration: Study Design

- Sample
- Sufficient size
- Attrition
Consideration: Study Design

Outcome

Relevant to the intervention

Established measures
Consideration: Study Findings

- Statistical Significance
- Effect Size
Consideration: Study Relevance

- Match to Population and Setting
- Match to Needs

**RELEVANCE OF THE STUDY’S FINDINGS**

Less relevant

- Population in the study does not match your population
- Setting of the study does not match your setting
- Outcomes in the study do not match your outcomes of interest

More relevant

- Population in the study matches your population
- Setting of the study matches your setting
- Outcomes in the study match your outcomes of interest
Scenario Example: Efficacy Study – Reading Intervention

- **Intervention**: K–2 reading intervention program to bring struggling students up to grade level, typically provided for 90 days.
- **Author**: Conducted by a university-affiliated research center published in a peer-reviewed journal.
- **Design**: Randomized Controlled Trial (RCT) that lasted for 180 days.
- **Sample**: 427 student participants in 9 schools across two school districts (one rural, one suburban); 85% economically disadvantaged, 4% English learners, and 9% eligible for special education services; 37% Hispanic, 34% African American, and 29% White. 60 students dropped out of the study, though the study did not specify how many from the treatment or control groups. Baseline scores for each group were reported.

- **Overall Results**: Students in K and grade 1 assigned to the intervention had statistically significantly higher scores on the aligned program assessment and DIBELS compared to K and grade 1 students in the control group. Students in grade 2 assigned to the intervention had statistically significantly higher scores, compared to grade 2 students in the control group, on the aligned program assessment only. No effect size was reported.

- **Subgroup Results**: All subgroup findings mirrored the main findings except English learners in the treatment group did not make statistically significant achievement gains compared to English learners in the control group. This was true in all grades studied.
<table>
<thead>
<tr>
<th>Consideration</th>
<th>Element</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>Credibility</td>
<td>Accessed from eric.ed.gov</td>
</tr>
<tr>
<td>Source</td>
<td>Peer Review</td>
<td>Published in a peer-reviewed journal</td>
</tr>
<tr>
<td>Source</td>
<td>Independent Researchers</td>
<td>University-affiliated research center</td>
</tr>
<tr>
<td>Design</td>
<td>Research Design</td>
<td>Described as an RCT that lasted 180 days (more than twice as long as the program itself); would need more information to determine if the RCT was well-designed and well-implemented</td>
</tr>
<tr>
<td>Design</td>
<td>Baseline Equivalency</td>
<td>Not necessary because students were randomly assigned to receive the intervention, but the study reported baseline scores</td>
</tr>
<tr>
<td>Design</td>
<td>Sample</td>
<td>427 students, but 60 students dropped out – not sure from which group</td>
</tr>
<tr>
<td>Design</td>
<td>Outcome</td>
<td>Relevant to the intervention and used the established measure of DIBELS and a program-embedded assessment (developed by the intervention designers)</td>
</tr>
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<td>Rationale</td>
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<tr>
<td>Findings</td>
<td>Statistical Significance</td>
<td>K and 1st grade students in the treatment group had statistically significantly positive outcomes on both assessments compared to the control group; 2nd grade only on the program-embedded assessment; ELs did not make statistically significant gains</td>
</tr>
<tr>
<td>Findings</td>
<td>Effect Size</td>
<td>None reported</td>
</tr>
<tr>
<td>Relevance</td>
<td>Match to Population and Setting</td>
<td>Two school districts (one rural, one suburban); 85% economically disadvantaged, 4% English learners, and 9% eligible for special education services; 37% Hispanic, 34% African American, and 29% White</td>
</tr>
<tr>
<td>Relevance</td>
<td>Match to Needs</td>
<td>Consider if DIBELS and the program assessment align with your outcomes of interest. Especially given the non-significant results for ELs, would need to consider how this would meet your population and setting.</td>
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</table>
Questions to Consider

- What evidence level do you think this study meets and why?
- What more do you need to know about the study to help you determine which evidence tier it meets?
- Were there any subjectivity/potential bias considerations/questions?
- Were there any research design/outcomes considerations/questions?

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<td>☐ Peer Review</td>
<td>☐ Baseline Equivalency</td>
<td>☐ Effect Size</td>
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<td>☐ Independent Researchers</td>
<td>☐ Sample</td>
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<td></td>
<td>☐ Outcome Measures</td>
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Using the *Basics of Reviewing a Research Study* Resource
Becoming ESSA Investigators

ADE Move On When Reading
Webinar participants spent time in breakout rooms discussing example prompts.
Thank you!

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