

What Works Clearinghouse™ Resources You Can Use

Designing Quasi-Experiments: Meeting What Works Clearinghouse Standards Without Random Assignment

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Today's Speakers



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Webinar Overview

- ▶ **The What Works Clearinghouse (WWC) and standards**
- ▶ **Quasi-experimental designs (QEDs)**
 - Characteristics of high-quality QEDs
 - Tips and cautions
- ▶ **Resources**
- ▶ **Staying informed and Q&A with participants**

WWC: Who, What, and Why

Who we are:

- ▶ An initiative of the Institute of Education Sciences (IES) at the U.S. Department of Education

What we do:

- ▶ We review the research in education to answer the question **“What works in education?”**

Why we do it:

- ▶ To provide educators with the information to **make evidence-based decisions**

The screenshot displays the homepage of the What Works Clearinghouse. At the top, there is a navigation bar with the IES logo and the site name. Below this, a main banner features a filmstrip graphic with the text: "New video materials based on the Improving Reading Comprehension in Kindergarten Through 3rd Grade practice guide are now available." To the right of the banner, a section titled "Evidence for What Works in Education" explains the site's mission: "We review the research on the different programs, products, practices, and policies in education. Then, by focusing on the results from high-quality research, we try to answer the question 'What works in education?'" and states the goal is to provide educators with evidence-based information for decision-making.

The lower portion of the page is divided into several sections:

- Publications & Reviews:** Promotes that 10,310 studies have been reviewed and lists product types like practice guides, intervention reports, single study reviews, quick reviews, and a studies database.
- Find What Works!:** Includes a search interface and lists outcomes such as improving literacy skills, increasing math achievement, reducing dropout rates, and helping students with special needs.
- WWC Fact Check: Test Your Knowledge...:** A quiz section with a "NEW" badge, offering a "True" or "False" response.
- What's New?:** A list of recent publications, including a webinar for principals and teachers, a study on iPad's Solar Walk application, and a review of classroom assessment strategies.

WWC Evidence Standards Identify Rigorous Evidence

- ▶ **Developed by panels of national experts**
- ▶ Focus on **causal validity** of the study design and analysis (important contextual factors are described)
- ▶ Applied to each study by **independent, certified reviewers**
- ▶ Result is a **study rating**
 - *Meets WWC Group Design Standards without Reservations*
 - *Meets WWC Group Design Standards with Reservations*
 - *Does Not Meet WWC Group Design Standards*

Features of Comparison Group Designs

Randomized Controlled Trials (RCTs)

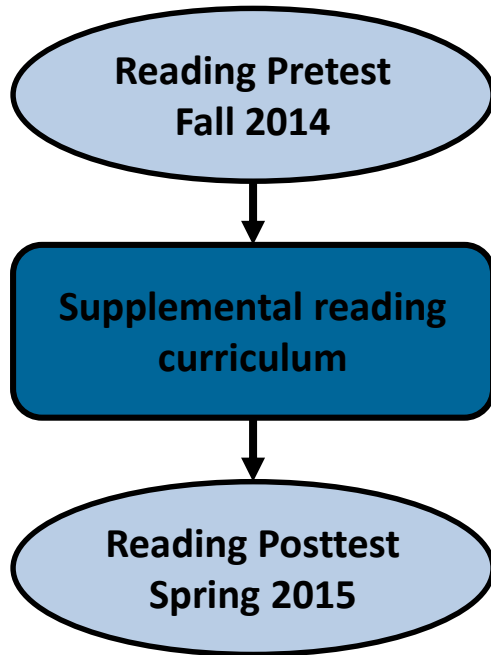
- ▶ **Randomly assigned** to treatment or comparison group
- ▶ Created similar on **observables** and **unobservables**
- ▶ Outcome differences due **only to intervention**
- ▶ **Can receive highest rating**, *Meets Group Design Standards Without Reservations*

Quasi-Experimental Designs (QEDs)

- ▶ **Assignment not random** – some receive treatment and some do not
- ▶ Can demonstrate similar **only on observables**
- ▶ Outcome differences possibly due to **intervention and other factors**
- ▶ *Can Meet Group Design Standards With Reservations*, but **cannot receive highest rating**

The High-Quality Quasi-Experimental Design

Intervention group 3rd graders



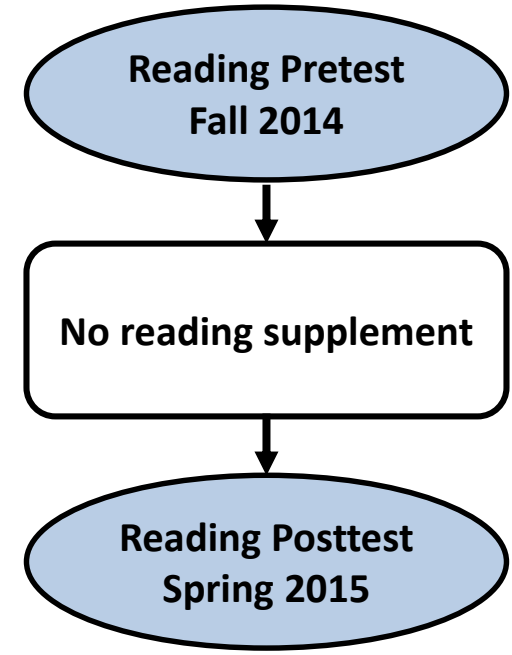
Distinct groups

Baseline equivalence

No confounding factors

Eligible outcomes

Comparison group 3rd graders



Distinct Groups

Intervention group
3rd graders

Distinct groups

Comparison group
3rd graders

- ▶ At least **two groups** (one intervention and one comparison)
 - **Not** a group compared to itself (same students in grades 3 and 4)
- ▶ Created **non-randomly**
 - Convenience sample
 - Propensity score matching
 - Retrospective

Baseline Equivalence



- ▶ Differences before intervention could carry through to outcomes
- ▶ Demonstrate groups were **similar prior to intervention** (at baseline)
 - Specific characteristics listed in each review protocol; including proxies
- ▶ WWC looks at the size of the difference
 - Effect size (ES) units – see *Handbook* for calculation
 - **Statistical adjustment** – pretest as covariate, not gain score or diff-in-diff

0.00 ≤ ES Difference ≤ 0.05	0.05 < ES Difference ≤ 0.25	ES Difference > 0.25
Satisfies baseline equivalence	Statistical adjustment required to satisfy baseline equivalence	Does not satisfy baseline equivalence

No Confounding Factors

Supplemental reading
curriculum

No confounding factors

No reading supplement

- ▶ A component **completely aligned with only one study condition**
 - Impossible to separate effect of intervention and confounding factor
 - Cannot attribute impact solely to intervention
 - *Study Does Not Meet WWC Group Design Standards*

- ▶ Common confounds
 - **Single unit** (school, classroom, teacher) in one or both conditions
 - **Person delivering intervention** has no contact with comparison group
 - Intervention is **bundled** with other services not being studied
 - Treatment and comparison occur at **different points in time**

Eligible Outcomes

Reading Posttest
Spring 2015

Eligible outcomes

Reading Posttest
Spring 2015

- ▶ Used to determine the **impact of the intervention**
- ▶ Eligible outcomes (and data) have the following characteristics:
 - **Face validity** – measures what it is supposed to measure
 - **Reliability** – measures things consistently
 - Not **overaligned** with the intervention
 - **Collected in a similar manner** across groups
 - **No imputation** of missing data

Take 5: Things to Keep in Mind About QEDs

- ▶ Start with at least two **distinct groups**, one intervention and one comparison
- ▶ Assess **baseline equivalence** and **statistically adjust** if necessary
- ▶ Avoid **confounding factors** such as single units or bundled interventions
- ▶ Collect data on **eligible outcomes** before and after the intervention
- ▶ Clearly **document** sample, data collection, analytic procedures, and findings

Resources

- ▶ **WWC Procedures and Standards Handbook**
 - <http://ies.ed.gov/ncee/wwc/DocumentSum.aspx?sid=19>

- ▶ **WWC Reporting Guide for Study Authors**
 - http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_gsa_v1.pdf

- ▶ **WWC Study Review Guide and Instructions**
 - <http://ies.ed.gov/ncee/wwc/StudyReviewGuide.aspx>

- ▶ **WWC Review Protocols**
 - http://ies.ed.gov/ncee/wwc/Publications_Reviews.aspx?f=All%20Publication%20and%20Review%20Types,5;#pubsearch

- ▶ **WWC Database of Reviewed Studies**
 - <http://ies.ed.gov/ncee/wwc/ReviewedStudies.aspx>

Stay Informed

An upcoming **topical bulletin** will highlight the WWC review process and **key resources**



To receive regular updates:



Facebook:

<http://facebook.com/whatworksclearinghouse>



Twitter:

<https://twitter.com/WhatWorksED>



Email Newsflash:

<http://ies.ed.gov/newsflash/?url=%2Fncee%2Fwwc%2Findex%2Easp&site=What+Works+Clearinghouse>

Help Improve the WWC



Send suggestions to:

What Works Clearinghouse Help Desk

<http://ies.ed.gov/ncee/wwc/ContactUs.aspx>



Questions and Answers