

WWC Practice Guide for Educators™

Development Guidelines

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I. INTRODUCTION

The What Works Clearinghouse (WWC) seeks to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence for what works in education. The WWC was established in 2002 by the U.S. Department of Education's Institute of Education Sciences (IES). It serves as a resource for decision making by helping the education community locate and recognize credible and reliable evidence. The WWC uses consistent, transparent standards for systematically reviewing and synthesizing existing research, and produces several types of publications, including quick reviews, intervention reports, single study reviews, and practice guides.

A. Purpose of WWC Practice Guides for Educators

WWC Practice Guides are designed to provide practical, evidence-based recommendations to teachers and administrators about how to address current challenges in education. Authors of the practice guides combine their expertise with available research evidence to develop specific recommendations for addressing these challenges. For each recommendation, information is provided about how to carry out the recommendation, possible implementation roadblocks, and the strength of the research evidence that supports the recommendation.

Practice Guide topics reflect a range of important issues in education that are useful to a large number of users, including .reading, mathematics, response to intervention (RtI), and dropout prevention. The WWC prioritizes practice guide topics based on their potential to improve important student outcomes, their applicability to a broad range of students or to particularly important subpopulations, their policy relevance, perceived demand within the education community, and the availability of rigorous research to support recommendations. Practice guides published by IES are available on the WWC website by selecting the Practice Guides tab at http://ies.ed.gov/ncee/wwc/publications_reviews.aspx#pubsearch.

After a WWC Practice Guide is released, the research, recommendations, and expertise contained in the Practice Guide are used to develop content on the Doing What Works (DWW) website (<http://dww.ed.gov>). DWW is a website that provides multimedia products, tools, and other resources to translate research to practice and forms a bridge for educators to understand and implement research-based practices. The WWC and the Office of Planning, Evaluation and Policy Development work together to encourage the distribution and use of the WWC Practice Guides for educators through the DWW website.

B. Components of WWC Practice Guides

WWC Practice Guides follow a predictable format that includes the following components (for more detailed information, see Appendix A):

- Overview of Recommendations
- IES Levels of Evidence for Practice Guides
- Introduction
- Recommendations
 - Summary of Evidence

- How to Carry Out Recommendation
- Roadblocks and Solutions
- Conclusion (optional)
- Glossary (optional)
- Appendices A, B, and C
- Appendix D: Rationale for Evidence Rating

C. Practice Guide Teams

This manual is designed for use by WWC Practice Guide team members, which typically include the panel and the panel support team. Specific roles include the following:

- The Panel
 - **Panel Chair:** an expert in his or her field, responsible for leading the practice guide panel members in the development of the guide
 - **Panelists:** practice, content, and methodological experts (typically five to seven, including two practitioners) who evaluate research and develop recommendations
- The Panel Support Team
 - **Evidence Coordinator(s):** coordinates the literature search and review process, and ensures research used to support recommendations is rigorous and relevant
 - **Practice Coordinator(s):** ensures the how-to steps of recommendations are concrete, specific, and appropriate
 - **Panel Coordinator:** organizes meetings, takes notes, and manages the shared document site (SharePoint, for example)
 - **Key Staff Leader:** coordinates the development of the guide, serves as a liaison between the panel and WWC staff, and ensures that the process remains on schedule
 - **Reviewers:** assess relevant research against WWC standards

Although the established steps for developing a WWC Practice Guide are described in this manual, the approach for developing each guide may vary depending on the guide's topic and the panel's perspective. The manual provides information about four stages of the process:

- Stage 1: Planning and Start-Up
- Stage 2: Identifying and Reviewing Evidence
- Stage 3: Conference Calls and Meetings to Develop Recommendations and Write the Guide
- Stage 4: Preparing the Final Practice Guide

II. STAGE 1. PLANNING AND START-UP

WWC Practice Guide development begins with planning and start-up activities, which include establishing a purpose statement, developing a support team, and selecting the panelists. By the end of the planning and start-up stage, the focus of the practice guide is clearly defined so that, once convened, the panel can begin discussions.

A. Establish a Purpose Statement

The purpose statement defines the topic that the practice guide will address, provides a framework for decisions about the scope of the practice guide (e.g. grade levels, instructional settings, special populations, etc. that will be included), discusses the existing evidence base, and identifies areas of expertise that should be represented on the panel. The practice guide team uses the purpose statement to focus the literature search and to develop the literature review protocol. Finally, within the topic of interest, the purpose statement helps panelists focus their recommendations on possible solutions to a well-defined problem.

B. Develop a Support Team

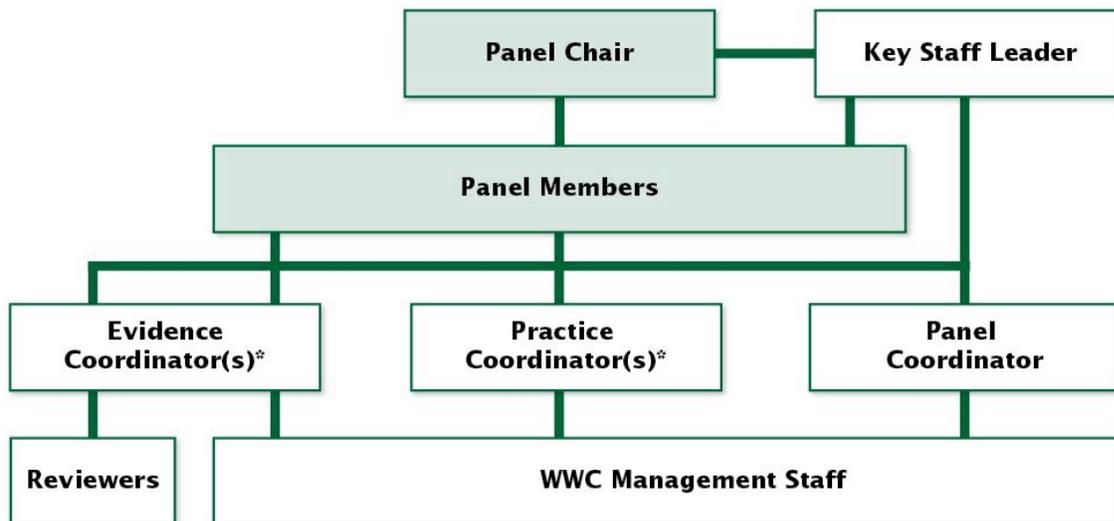
Members of the WWC panel support team work together with the panel and play critical roles in the development of the practice guide. The support team includes the following: (1) an evidence coordinator(s), who ensures that the research used to support recommendations is rigorous and relevant; (2) a practice coordinator(s), who ensures that the how-to steps of a practice guide are concrete, specific, and appropriate; (3) a panel coordinator, who organizes meetings, takes notes, and manages the practice guide SharePoint site and (4) reviewers, who assess whether supporting literature meets WWC standards. Either the evidence coordinator or the practice coordinator also serves as the practice guide’s key staff leader to facilitate communication between the panelists, the support staff, and WWC management. Table II.1 further explains key responsibilities of the support team members, and Figure II.1 shows the organization of the practice guide team.

Table II.1. Responsibilities of WWC Practice Guide Panel Support Team

Role	Responsibilities
Evidence Coordinator(s)	<ul style="list-style-type: none"> Works with the panel chair to create a protocol for reviewing literature Solicits relevant citations from panelists Oversees literature search and screening processes Tailors the WWC study review guide supplementary information section Trains reviewers in the protocol Manages the review process Responds to reviewer inquiries and serves as a reconciler Presents summaries of the literature reviews to the panel Works with the panel and practice coordinator(s) to map the practices to literature that meet standards Supports discussions about the level of evidence for each recommendation Prepares the practice guide technical appendix
Practice Coordinator(s)	<ul style="list-style-type: none"> Assists with preparing the purpose statement Compiles a preliminary list of potential practices based on the literature review Ensures that recommendations are specific, concrete, and actionable Prepares drafts of the recommendations Works with the panel and evidence coordinator(s) to map the practices to literature that meet standards Ensures the text regarding evidence is clear to a nontechnical audience and remains technically accurate

Role	Responsibilities
Panel Coordinator	<p>Creates and maintains the shared document platform</p> <p>Provides technical assistance to panelists to use the shared document platform and to help with logistical inquiries</p> <p>Ensures panelists and team members complete the necessary authorship, honorarium, contract, and conflict of interest forms</p> <p>Schedules all conference calls and meetings</p> <p>With the chair and key staff members, prepares materials for meetings (background memos, agendas, and so on)</p> <p>Coordinates all meeting logistics, including reserving a block of hotel rooms</p> <p>Takes notes and develops minutes for all conference calls and meetings</p> <p>Provides research assistance</p> <p>Ensures panelists understand reimbursement processes and procedures</p>
Key Staff Leader	<p>Develops proposed statement of work for IES approval</p> <p>Works with panel chair to arrange invitations for panelists</p> <p>Oversees arranging all conflict of interest and honoraria forms with panelists</p> <p>Sends key emails to the panel (for example, confidentiality email)</p> <p>Collaborates with evidence coordinator for initiating literature search, drafting review protocol, and overseeing the review process</p> <p>Customizes all meeting agendas</p> <p>Oversees panel coordinator for arranging logistics for all panel meetings</p> <p>Understands document sharing platform and encourages its use among practice guide team, panel chair, and panelists</p> <p>Facilitates mapping the practices to literature that meets standards</p> <p>Facilitates completion of all drafts of the practice guide</p> <p>Facilitates response to external reviewers, IES, and peer review comments</p> <p>Ensures the development process adheres to the schedule</p>

Figure II.1. Organization of a WWC Practice Guide Team



*One of these individuals may also act as the key staff leader.

C. Select Panelists

An essential ingredient in a WWC Practice Guide is the expert advice of the panelists. Each panel is chaired by a nationally recognized researcher with expertise in the topic area and consists of four or five additional researchers with expertise in specific aspects of the topic area or relevant methodologies. Each panel also includes practitioners who offer practical suggestions about implementation based on their experience.

Panel chair. The panel chair is an expert in his or her field and is responsible for leading practice guide panel members in developing the practice guide (Table II.2). The panel chair assists in identifying and recruiting panel members and developing the review protocol and literature search parameters. The panel chair leads practice guide panel members in developing research-based recommendations, articulating how to implement the recommendations, and addressing potential roadblocks for implementation. To accomplish these tasks, the panel chair should be familiar with WWC evidence standards, understand the WWC process for reviewing studies, and support the use of evidence to develop recommendations for improving student outcomes. The panel chair should also be adept at running meetings and keeping the panel focused on developing a consensus-based product within the specified time frame.

Panelists. The practice guide panel is composed of content and methodological experts. Panelists are researchers and/or practitioners identified as experts in their field who, along with the panel chair, recommend research-based practices, suggest how to implement those practices, and address potential roadblocks for implementing the recommendations (Table II.2).

Table II.2. Responsibilities of the Panel Chair and Panelists

Responsibility	Panel Chair	Panelist
Assist in identifying and recruiting panel members	X	
Develop the review protocol and literature search parameters	X	X
Provide citations of seminal studies for priority review	X	X
Oversee conference calls and in-person meetings	X	
Actively participate in conference calls and in-person meetings	X	X
Assist in establishing practice guide recommendations	X	X
Participate in drafting and revising the practice guide	X	X
Facilitate panel discussions on the levels of evidence for recommendations	X	
Participate in discussions about levels of evidence for recommendations	X	X
Provide feedback and approval on all drafts of the practice guide	X	X
Provide feedback for responding to peer review comments	X	X
Provide suggestions for key dissemination sources	X	X

The participation of the panel chair and all panelists is contingent on the completion and submission of two forms: a conflict of interest disclosure and an authorship release (see Appendix C for more information).

III. STAGE 2. IDENTIFYING AND REVIEWING EVIDENCE

The second stage in developing a WWC practice guide is to conduct a systematic review of the research evidence according to a WWC review protocol.

A. Develop Review Protocol

The practice guide draft review protocol is developed by the panel chair and support staff, and defines the scope of the literature search and the subsequent systematic review process. Table III.1 displays the key components included in the review protocol and a description of what the protocol defines.

Table III.1. Components of a Review Protocol

Issue	Description
Screening Criteria	<p>Defines key parameters for:</p> <ul style="list-style-type: none"> • Relevant time frame for publication • Relevant ages/grades of students • Other defining student characteristics (e.g., English language learners)
Study Design	<p>Describes different types of studies, including those eligible for WWC review with standards or pilot standards, such as:</p> <ul style="list-style-type: none"> • Randomized controlled trial (RCT) studies • Quasi-experimental design (QED) studies • Single case design (SCD) studies • Regression discontinuity design (RDD) studies <p>If relevant, describes studies that can be included in the guide but are not eligible for WWC review, such as:</p> <ul style="list-style-type: none"> • Correlational studies • Case studies
Types of Relevant Interventions and Practices	Specifies the relevant topics, practices, and types of interventions that relate to the practice guide topic
Outcomes	Defines all domains and relevant outcomes of interest; additional aspects of outcomes might be specified, such as psychometric parameters or rules regarding follow-up measures
Attrition Standards for RCTs	Thresholds for overall and differential attrition are identified in accordance with WWC standards
Baseline Characteristics for Equivalence	All QEDs (and RCTs with high attrition) must demonstrate that groups being compared post-attrition are equivalent on relevant characteristics at baseline
Statistical and Analytical Issues	Guidance is offered on adjusting for preintervention differences and multiple comparison adjustments in accordance with the WWC standards version 2.0
Study Ratings	<p>Defines study ratings as they relate to the current version of WWC evidence standards:</p> <ul style="list-style-type: none"> • Meets WWC evidence standards • Meets WWC evidence standards with reservations • Does not meet WWC evidence standards • Uncertain/potentially meets standards pending author query
Literature Search Terms	Combinations of terms that relate to content and method are specified

B. Literature Search

The purpose statement and review protocol provide the initial parameters that WWC staff use to search electronic databases for relevant studies. Studies suggested by the panelists for review are also included in the master list of references that are stored in reference-tracking software (such as RefWorks).

During the development of the practice guide, the panel's discussion of potential recommendations may lead to an expanded literature search, or the panel may expand the scope of the recommendations. In these cases, support staff may conduct additional literature searches to include additional relevant studies for review. This iterative process ensures that panelists are not constrained to recommending only those practices that are identified through an initial review of literature.

C. Literature Screening

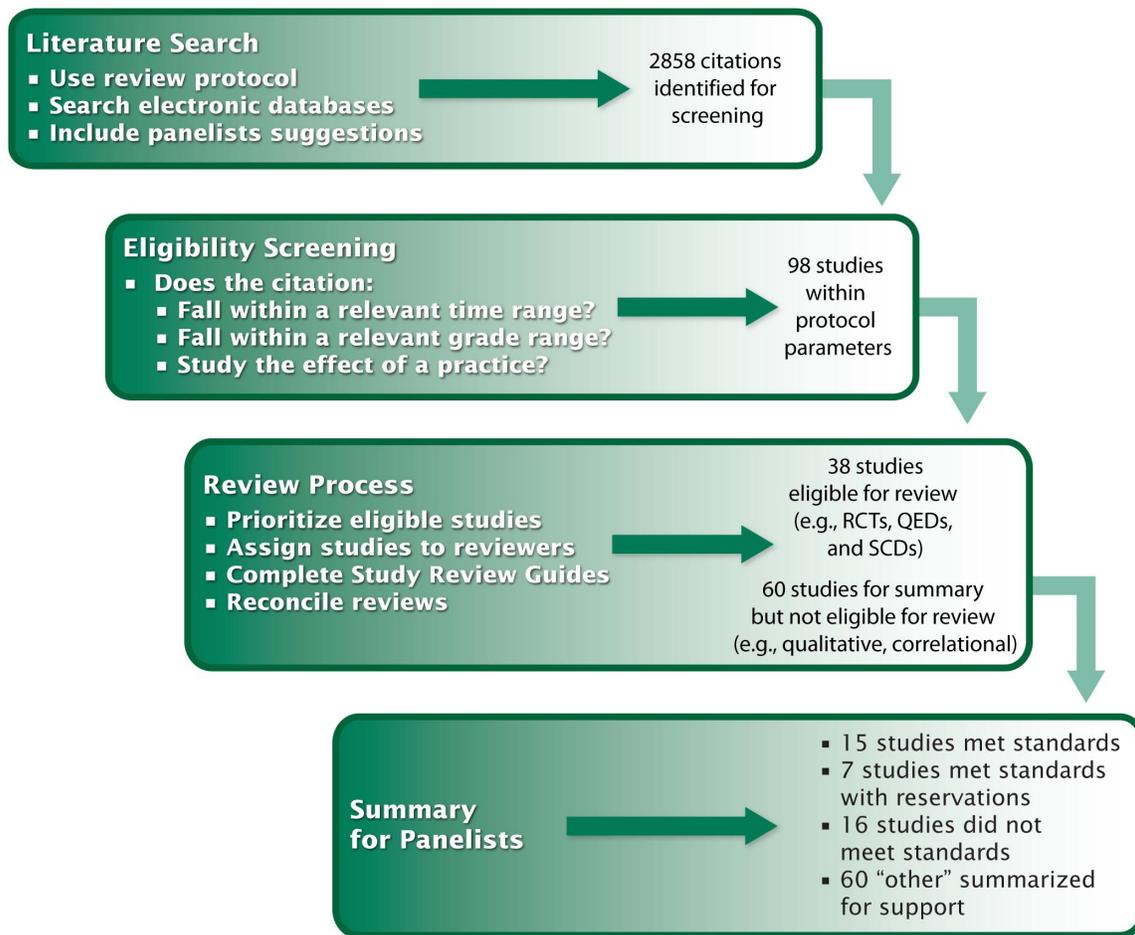
All studies that are identified through the literature search as relevant to the practice guide topic are screened to determine if a full WWC review will be conducted. Slight variations exist, but four general criteria are examined during the screening process:

1. **Was the study published in the relevant time range?** Unless the review protocol states otherwise, studies published within 20 years of the beginning of the review are eligible. This time frame encompasses research that adequately represents the current status of the field and current analytical methods and avoids inclusion of research conducted with populations and in contexts that may be very different from those existing today.
2. **Is the study a primary analysis of the effect of a practice?** Some research studies identified in the literature search are not primary studies of a practice's impacts or effectiveness and cannot provide evidence of the effects of the practice for the WWC review. For example, implementation studies, literature reviews, or meta-analyses are not eligible for WWC review. Such studies and papers can, however, be summarized to support the panel's recommendations.
3. **Does the study have an eligible design?** To be reviewed against WWC standards or pilot standards, a study must use one of the following designs: randomized controlled trial, quasi-experimental design, regression discontinuity design, or single case design.
4. **Does the study fall within protocol parameters?** The parameters of the protocol are different for each guide, but for screening purposes, they typically include student age/grade range, special subpopulations, and specific subject material or focus.

D. Prioritizing Studies for Review

After the initial literature screening is completed, the evidence coordinator prioritizes studies for review with input from the panel. Using information in the title, abstract, and full text, the evidence coordinator ranks the study based on design and perceived relevance to topics of panel interest. Once all studies are prioritized, the evidence coordinator assigns studies to reviewers to begin the review process.

Figure III.1. Example of the Literature Search, Screening, and Review Process



RCT = randomized controlled trial; QED = quasi-experimental design; SCD = single case design.

E. Review Process

All eligible studies are assessed against WWC evidence standards. Reviewers follow guidelines that ensure each study meets the scope and criteria for the practice guide, as outlined in the review protocol. When reviewers complete a study review, they update the tracking mechanism in the shared document platform and upload a study review guide (SRG), taking care to provide complete, concise, and correct information.¹ Reviewers use the study review guide to assign each study one of four possible ratings:

- **Meets WWC evidence standards.** This rating is used for well-designed and well-implemented randomized controlled trials.

¹ Study review guides are used to determine the evidence of causal validity of each study according to WWC evidence standards. See <http://ies.ed.gov/ncee/wwc/StudyReviewGuide.aspx>.

- **Meets WWC evidence standards with reservations.** This rating is used for strong QED studies and RCTs with notable design or implementation flaws.
- **Does not meet WWC evidence standards.** This rating is used for studies that fail to meet WWC evidence standards, with or without reservations.
- **Uncertain: Potentially meets standards pending an author query.** If more information is needed to determine whether a study meets standards, it receives an “Uncertain” interim rating until the evidence coordinator determines whether to contact the study author(s) for more information. This typically refers to QEDs that do not provide sufficient information to assess baseline equivalence.

If a study receives a rating of either “Meets Standards” or “Meets Standards with Reservations,” the evidence coordinator assigns a second reviewer to review the study. Information from both reviewers is combined to create a master study review guide, and a reconciliation meeting is scheduled with either the evidence coordinator or a senior WWC reviewer to discuss discrepancies. Studies rated as “Does Not Meet Standards” are assessed by a senior reviewer to confirm the reason(s) the study did not meet standards.

At various points throughout the development of the practice guide, practice guide staff members summarize the work of the reviewers. Summaries of the research evidence help panelists see how individual studies align with proposed recommendations, action steps, and roadblocks. Panelists can also refer to the master study review guide for information collected during the review process. Summaries also are used by panelists as they determine the level of evidence for practice guide recommendations.

IV. STAGE 3: CONFERENCE CALLS AND MEETINGS TO DEVELOP THE RECOMMENDATIONS AND WRITE THE PRACTICE GUIDE

While the WWC reviewers examine the research evidence, the panel works with the support staff to develop the recommendations through a series of conference calls and meetings. The goal of these calls and meetings is to arrive at a consensus about the practice guide recommendations and content that will be included in the practice guide. Dates and locations for conference calls and in-person meetings are scheduled early in the process so that the predetermined deadlines for completing the guide can be met.

All panel meetings and conversations are considered closed and privileged; panelists may not discuss the panel's deliberations with individuals outside of the practice guide team.

A. First Conference Call

The first conference call serves four key purposes: (1) introduce the panelists to each other and the support team, (2) review the panel's mission, (3) discuss the approved purpose statement and review protocol, and (4) discuss potential recommendation topics. During the call, panelists learn about the practice guide process and are encouraged to share citations or suggest additional literature search terms.

Before the call. Panelists are asked to provide the support team with a list of themes that could serve as the basis for recommendations before the call to. These themes are general ideas rather than specific recommendations. For example, in the topic of reading comprehension, themes might include selecting appropriate texts, the importance of discussion, and motivation to read. Support team members provide panelists with the following materials:

- This practice guide manual
- Contact information and short biographical statements for the panel chair and all panelists
- Purpose statement, as approved by IES
- Draft review protocol, approved by the panel chair
- Conference call-in number and webinar link

During the call. Five key points are covered during the first conference call:

1. **Overview of WWC Practice Guides.** The key staff leader or a member of the WWC management team explains how a practice guide is developed and key components of a practice guide.
2. **Review practice guide timeline.** The WWC staff member describes the timeline for producing a practice guide.
3. **Review logistics and supporting staff roles.** Support staff describe critical logistical information and the roles of the supporting staff, such as whom to contact with questions regarding evidence and reviews, developing the recommendations and action steps, and specifics relating to the contractual and reimbursement forms.

4. **Discuss the purpose statement and review protocol.** The panel chair describes key points of the purpose statement and facilitates discussion to determine whether modifications to the purpose statement or review protocol should be made. Panelists must agree on the parameters of the practice guide topic in order to begin thinking about relevant recommendations.
5. **Discuss suggested themes.** WWC support staff synthesize the themes submitted by panelists before the call and present them during the call. Panelists use these themes as a basis for brainstorming additional themes and for suggesting related studies and additional literature search terms (for example, pairing ‘motivation’ with ‘reading comprehension’). Chosen themes will later be developed into recommendations.

After the call. Within a week of the first conference call, panelists receive any necessary updated documents from the practice coordinator. Panelists also receive summary minutes from the call. Within 10 business days of the call, panelists provide support staff with potential citations for review, as well as additional literature search parameters.

B. First In-Person Meeting

The purpose of the first meeting is to refine the scope of the guide, define key terms, and determine initial recommendations and action steps. Supporting staff members also review the practice guide process, related key activities and deadlines, and logistical information with panelists. The in-person meeting generally lasts two days.

Before the meeting. The panel coordinator arranges meeting details before the meeting, including reserving a block of hotel rooms, reserving meeting space with appropriate technical and Internet needs, and encouraging panelists to make their own travel arrangements.

In preparation for the meeting, supporting team members conduct the following tasks:

- **Locate and document an initial list of practices from key studies.** This list will help panelists develop evidence-based recommendations. To prepare the practice list, supporting staff members identify practices from the highest quality studies already reviewed and/or summarized for the guide. The list can also include the themes identified by the panel in the first conference call, but these should be noted as panel-identified, which can be different than those identified from evidence-based studies.
- **Develop PowerPoint materials.** These materials will be used to provide an overview of the key components of a practice guide and the development process, the document management system, presentation of the study review guide, and a tutorial of the study tracking database.

At least 72 hours before the meeting, panelists receive the following:

- A list of studies that have been screened and are eligible for WWC review, with as much summary detail as possible
- An initial list of practices/themes
- Information on travel and meeting logistics

Day one of meeting. Four items are typically covered during the first day of the meeting:

- **IES practice guide development process.** Supporting staff members review the practice guide process and timeline of key activities.
- **Finalize practice guide scope.** The panel discusses the intended audience for the guide and relevant student characteristics (for example, grade level) as well as definitions for relevant practices and outcomes. The following general guiding questions are used to structure the discussion:
 - Why should the guide be developed?
 - What issues is it intended to address?
 - What does the panel hope will improve as a result of implementing the recommendations?
 - What are the academic, social, or other implications for addressing the problem?
 - Who is the audience for the guide?
- **Review key practices/themes.** Supporting staff members use key themes identified by the panelists during the first conference call, as well as the initial list of practices from key studies to facilitate efficient discussion about topics for recommendations.
- **Develop potential recommendations and action steps.** A supporting staff member reviews the characteristics of an actionable recommendation for a WWC practice guide, and then the panel identifies potential recommendations as a large group. After general consensus has been reached about the list of potential recommendations, the panel breaks into small groups of two or three to discuss one or more potential recommendations. In the small group discussions, panelists are asked to focus on developing an actionable recommendation and action steps related to the practice or theme, discussing the relevance of the proposed recommendation and action steps to the overall practice guide, and considering evidence that could support the recommendation and action steps. Teams then present their ideas to the larger group.

Day two of meeting. On the second day of the meeting, the panel continues working in small groups to develop recommendations; these groups then present ideas to the larger group. Two additional items are also covered during the second day of the meeting:

1. **Recommendation order.** Panelists discuss the order in which the recommendations will appear in the guide. Some panels may decide to order the recommendations so that each recommendation depends upon the previous one. Other panels may decide to place the most important, easiest to implement, or most innovative recommendations first to capture the reader's attention. Panels are encouraged to discuss and develop a framework for organizing the recommendations.
2. **Introduction to the study tracking mechanism.** Supporting staff members explain to panelists how to use the study tracking mechanism on the shared document platform to read about the disposition of individual studies after they have been

reviewed. Throughout the development of the practice guide, panelists can access the study tracker to examine studies.

After the meeting. Within 10 business days of the meeting, panelists receive summary minutes from the meeting. Additionally, panelists are asked to provide staff with the following:

- Potential citations to prioritize for review based on recommendations, action steps, or roadblocks that were defined during the meeting
- Suggestions for additional search terms, if new literature searches need to be conducted according to the recommendations and action steps identified during the first panel meeting

C. Second In-Person Meeting

The purpose of the second in-person meeting is to reach consensus about: (1) the intent of each recommendation, including the action steps and roadblocks; and (2) the information that will be included in the introduction of the practice guide. In addition, the panel begins to discuss the level of evidence associated with each recommendation.

Before the meeting. The panel chair develops a draft of the introduction to the practice guide's and shares with the panel before the second meeting. The supporting team members complete the following tasks:

- **Complete study reviews.** All, or almost all, study reviews should be completed by the second in-person meeting.
- **Link evidence of practices with recommendations.** Practice guide staff members develop a detailed description of how to implement specific practices by examining WWC-rated studies of interventions and other sources. They then explicitly link the action steps in the guide to practices evaluated in WWC-rated studies. This effort serves as the basis for the concrete and actionable evidence-based suggestions for how to carry out each recommendation.
- **Develop a draft of the action steps and roadblock sections.** Practice guide support staff draft the action steps for each recommendation. Although the draft includes supporting citations, it does not contain text that describes the level of evidence for each recommendation. The draft is shared with the panel, who review it and participate in small-group conference calls, to refine the recommendations and add roadblocks. The draft can include the panel chair's draft of the introduction.
- **Develop PowerPoint materials** for an overview and presentation of the evidence, supporting evidence, and details about components of each section of the practice guide (for example, introduction, overview, scope, checklist, and author page).

The following documents are distributed via email to all panelists at least 72 hours before the second in-person meeting:

- IES Levels of Evidence Table (see Appendix A in this manual)
- Documentation of links between practices, studies, and study details

- Draft recommendations, action steps, and roadblocks with supporting citations
- Draft introduction text
- Information on travel and meeting logistics

Day one of meeting. Two main items are covered during the first day of the second in-person meeting: (1) finalize recommendations and action steps and (2) link evidence to each recommendation.

Finalize recommendations and action steps. The panel provides final approval for each recommendation, including the supporting text for action steps and roadblocks. Recommendations and action steps should be clear, brief, and precise. For each recommendation, panelists should describe conditions for implementation, including the following:

- When should the recommendation be implemented (that is, under what specific conditions)?
- Who should undertake implementation?
- What is the level of obligation for implementing the recommendation (that is, should or may)?
- What actions should occur?
- Whom is the recommendation intended to help/support?

Day two of meeting. The second day of the meeting builds on the previous day’s discussion. The panel continues to work through the recommendations and evidence associated with each recommendation. In addition, panelists comment on the introduction and review and update conflict of interest forms.

After the meeting. Within 10 business days of the meeting, panelists receive summary minutes of the meeting. Panelists also provide the panel coordinator with their brief biographies to include in the practice guide appendix. As the practice guide support team finalizes the practice guide, panelists are asked to review text and participate in conference calls if necessary.

D. Levels of Evidence Conference Calls

During conference calls, supporting staff members first present an overview of the levels of evidence for practice guides, reminding panelists about the definitions of “strong evidence,” “moderate evidence,” and “minimal evidence.”

A critical task for the panel is to determine whether the evidence cited in support of particular recommendations is up-to-date and that studies of similar or better quality that point in a different direction have not been overlooked. Supporting staff members present a summary of the evidence for each recommendation, and the panel considers the relevance of individual studies to the recommendation.

After considering individual studies, the panel’s discussion focuses on characterizing the evidence base in its entirety for each recommendation taking into consideration:

- the number of studies

- the study designs
- the internal validity of the studies
- whether the studies represent the range of participants and settings on which the recommendation is focused
- whether findings from the studies can be attributed to the recommended practice
- whether findings in the studies are consistently positive

In the end, the panel's discussion results in a clear justification for the level of evidence assigned for each recommendation.

V. STAGE 4. PREPARING THE FINAL PRACTICE GUIDE

The WWC strives to prepare high quality, user-friendly products. To achieve this goal, practice guides are reviewed by senior WWC management, practitioners, researchers, editors, and the IES Standards and Review Office. Each review results in revisions that improve the quality of the guide before being approved by IES for release on the WWC website.

A. Review and Production

Once a full practice guide draft is completed and agreed upon by the panel, it goes through the WWC's quality assurance process. The guide's content and presentation of the research are reviewed from a variety of perspectives. The guide is also edited to ensure that practitioner-friendly language is used. Practice guide support staff members, in conjunction with the panel chair, then revise the guide to address quality review comments and editorial suggestions for user-friendly language.

Panelists review and approve the revised draft before it is sent to IES. WWC Practice Guides are subjected to external peer review through the IES Standards and Review Office, which is responsible for the independent review of other IES publications. The practice guide support staff rely on panelists' feedback and suggestions to revise and resubmit the guide in response to iterations of peer review. After the final approval of the guide, a Section 508-compliant portable document format (PDF) version of the guide is developed for release on the WWC website.

B. Final Conference Call

A final conference call with the panel is held once IES approves the practice guide. The final conference call serves four key purposes: (1) to inform the panelists about WWC dissemination activities, (2) to determine additional dissemination sources, (3) to remind panelists about the confidentiality of all discussions and documents, and (4) to affirm the final payment schedule.

Before the call. Panelists review the proposed dissemination plan before the call and provide the names of additional organizations and individuals that should be added to a dissemination list to receive an e-postcard about the release of the practice guide.

During the call. Three items are covered during the final conference call:

1. **Review the dissemination plan.** A WWC staff member reviews the dissemination plan, including e-postcards to listservs and events.
2. **Review confidentiality.** Panelists are reminded that all conversations, documents, and information related to the guide are considered closed and privileged; panelists may not discuss the panel's deliberations or share drafts and documents relating to development of the guide with individuals outside of the practice guide team.
3. **Review logistics.** Support staff provide information about critical logistical information, such as final payment and any other remaining issues.

APPENDIX A

COMPONENTS OF A WWC PRACTICE GUIDE FOR EDUCATORS

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The components of the WWC Practice Guides are described in this appendix and include the following:

- Overview of Recommendations
- IES Levels of Evidence for Practice Guides
- Introduction
- Recommendations
 - Summary of Evidence
 - How to Carry Out Recommendation
 - Roadblocks and Solutions
- Conclusion (optional)
- Glossary (optional)
- Appendices A, B, and C
- Appendix D: Rationale for Evidence Rating

A. Review of Recommendations

The practice guide opens with a one-page overview of the recommendations and action steps.

B. IES Levels of Evidence for Practice Guides

This section describes the criteria for strong evidence, moderate evidence, and minimal evidence recommendations, as well as the process the panel uses for determining each recommendation's level of evidence. This section includes Table 1: IES Levels of Evidence for Practice Guides (see Appendix B).

C. Introduction

The introduction generally includes the following:

1. Overview

The overview provides the rationale for the guide, the educational challenge the guide is designed to address and how the panel envisions that readers will use the recommendations to address the educational challenge. Specifically, the panel may consider including the following:

- Data suggesting the nature of the educational challenge
- Assumptions the panel has made about the causes of the educational challenge or about the nature of the challenge at different grade levels

2. Scope of the Practice Guide

The introduction then discusses the scope of the practice guide, including the target audience and grade level, student outcomes considered in reviewing evidence, the range of evidence and practices reviewed, and any considerations readers should be aware of for interpreting recommendations. This section establishes the boundaries the panel set for the guide and can include considerations such as the following:

- A more complete description of the purpose of the guide, such as a mission or goal statement
- A more complete description of the target audience and how readers might use the recommendations
- Topics the panel did not consider or topics that were naturally excluded based on the target audience or purpose of the guide (for example, by targeting practices for schools only, the Dropout Prevention practice guide did not focus on general equivalency diploma programs or community involvement programs)
- Grade levels or subject areas
- Challenges encountered by the panel in developing recommendations and how the panel addressed these challenges
- Challenges or suggestions readers should consider in implementing recommendations
- Other topics that the panel feels readers should consider but that may not have enough evidence to justify including as a recommendation

3. Summary of the Recommendations

This section aims to be clear about how the panel conceptualized the recommendations and includes a short description of the rationale for each recommendation. It might include information about why the panel organized the recommendations in a certain order, whether recommendations should be implemented alone or are built upon one another, a discussion of challenges or suggestions readers should consider in implementing recommendations, and a discussion of challenges encountered by the panel in developing recommendations and how the panel addressed these challenges.

4. Summary of Supporting Research

This component of the introduction describes the body of research that contributed to the practice guide and levels of evidence for each recommendation. It should include a summary of the research that contributed to the development of the practice guide, limitations of the research base, and possibly suggestions for further research or information needed about the practice guide topic.

The introduction concludes with Table 2: Recommendations and Corresponding Levels of Evidence. This table lists each recommendation and the level of evidence to support the recommendation.

D. Recommendations

The recommendations are the most important part of the practice guide. Each recommendation is a distinct practice that the panel suggests teachers, schools or districts implement to address the issue at hand. In most cases, the panel will craft recommendations to address one of these basic questions:

- If a school or district has not addressed the issue at hand, what steps should be taken to do so? or
- If the school or district has begun to address the issue at hand, what could be done to improve current practices?

The panel assigns each recommendation a level of evidence rating (minimal evidence, moderate evidence, or strong evidence) that indicates the panel’s judgment of the quality of the existing research base for the recommendation.

Because recommendations are the central focus of the practice guide, they must be agreed upon and carefully crafted. Throughout the writing process, recommendations may be revised or deleted depending on the panel’s assessment of the level of evidence, reviews by researchers and practitioners, and peer review comments.

The wording of the recommendations is critical for capturing the reader’s attention. To that end, recommendations should be concise, actionable, and easy to read. For example, beginning recommendations with a verb can ensure active voice and clarity. Panelists focus on describing the actions that will help an educator to implement a recommendation. Selecting appropriate action-oriented verbs, such as those listed below, can help provide useful details for implementation.

Adapt	Coordinate	Include
Analyze	Create	Integrate
Appoint	Design	Maintain
Assess	Designate	Monitor
Assign	Develop	Provide
Build	Encourage	Recognize
Choose	Ensure	Review
Collect	Establish	Select
Communicate	Focus	Teach
Connect	Identify	Use

The recommendation wording should also not include undefined adjectives and does not need an abundance of specific details—both can be discussed in the body text. In addition, the panel should consider the order of the recommendations (see Section IV.B, First In-person Meeting, for more information).

Each recommendation is followed by an introductory paragraph that provides context and motivation for the recommendation.

E. Summary of Evidence

After careful review of the studies supporting each recommendation, panelists determine the level of evidence for each recommendation using the criteria in Appendix A, Table 1. The panel first considers the relevance of individual studies to the recommendation and then discusses the entire evidence base, taking the following into consideration:

- The number of studies
- The design of the studies
- The quality of the studies
- Whether the studies represent the range of participants and settings on which the recommendation is focused
- Whether findings from the studies can be attributed to the recommended practice
- Whether findings in the studies are consistently positive

A rating of *strong evidence* refers to consistent evidence that the recommended strategies, programs, or practices improve student outcomes for a wide population of students. In other words, there is strong causal and generalizable evidence.

A rating of *moderate evidence* refers either to evidence from studies that allow strong causal conclusions but cannot be generalized with assurance to the population on which a recommendation is focused (perhaps because the findings have not been widely replicated) or to evidence from studies that are generalizable but have some causal ambiguity. Sometimes, studies that exist do not specifically examine the outcomes of interest in the practice guide, although they may be related.

A rating of *minimal evidence* suggests that the panel cannot point to a body of research that demonstrates the practice's positive effect on student achievement. A minimal evidence rating does not indicate that the recommendation is any less important than other recommendations with a strong evidence or moderate evidence rating. In some cases, this simply means that the recommended practices would be difficult to study in a rigorous, experimental fashion; in other cases, it means that researchers have not yet studied this practice or that there is weak or conflicting evidence of effectiveness.

The Summary of Evidence section justifies the recommendation's level of evidence by describing the studies the panel used as basis for the recommendation. Description of the studies can be general because the appendix provides study details, but the section should clearly link the practices with their effects on outcomes. The section should also discuss the generalizability of the findings to populations of interest and limitations of the studies, if relevant. Moderate and minimal evidence ratings may require a brief discussion of evidence beyond studies rated by the WWC. This

section need not be lengthy, and it should communicate the differences in the types of studies that were considered in determining the recommendation.

F. How to Carry Out Recommendations

The How to Carry Out Recommendations section differentiates a practice guide from other research-based documents because it specifies evidence-based strategies for actionable ways to implement the recommendation. Each recommendation has between three and five action steps. Each action step is a discrete step schools or districts should take to implement the recommendation. The language of this section should be straightforward and nontechnical.

The panel will draw material for this section from the descriptions of practices provided in the relevant literature. For example, implementation reports or procedure sections of studies provide information about how the practice being recommended was implemented in evaluations and can be used for ideas for this section. Alternatively, a panelist may suggest how to implement a practice based on experience or expertise. Whenever possible, practices are linked to a study and cited.

For each action step, the text describes the specific practices that schools or districts should implement. For example, the text may indicate group size, the length of study sessions, or where to carry out the practice. The practice guide can also include text boxes to highlight examples or practices.

Panelists might want to include suggested resources for practitioners seeking further guidance. However, panelists should make suggestions about resources carefully, taking into consideration conflict of interest issues.

G. Roadblocks and Solutions

Roadblocks and solutions help practitioners think about how they can address potential problems. Moreover, this section provides readers with a sense that the practice guide authors recognize the challenges to making changes and want to be partners with educators in improving education. Solutions do not need to be lengthy but should be practical.

H. Conclusion

This section is optional and is included if the panel believes a conclusion will be helpful to readers. The conclusion is generally no more than two to three paragraphs. It serves as the “final charge” the panel provides to readers.

I. Glossary

Panels include a glossary of terms if they believe it will be helpful to the readers. Terms and definitions should be developed by the panel and reflect the way the terms are used within the practice guide.

J. Appendices A, B, and C

Appendix A is a postscript from IES describing practice guides. Appendix B introduces the panelists, and Appendix C notes any possible conflicts of interest that panelists or staff may have with the content of the guide.

K. Appendix D: Rationale for Evidence Rating

The evidence base for each recommendation is described in detail in the Rationale for Evidence Rating appendix. Each recommendation in the appendix begins with a description of the panel's justification for choosing a particular level of evidence, such as the types of studies that constitute the evidence base and any caveats or special considerations. After building a case for a particular level of evidence, the panel then provides details about the research studies used to develop and support the recommendation.

In the case of a strong evidence or moderate evidence rating, details on the samples, the intervention and comparison groups, the magnitude of the effects, and the limitations of the studies reviewed against WWC standards and pilot standards may be provided. Research that demonstrates a relation between the practice and outcomes—above and beyond what is already demonstrated by experimental, quasi-experimental, single case, or regression discontinuity research—may also be summarized in the appendix. Study details are typically grouped by topic (for example, all the research that relates to a particular action step is summarized together). An overview of the studies and key details is included in a summary table for each recommendation.

In the case of a minimal evidence rating, research that attempts to link the practices to outcomes or systematic analyses of the implementation of practices may be described. In all cases, extrapolations made by the panel and limitations of the evidence base are explicitly acknowledged in the appendix.

APPENDIX B

IES LEVELS OF EVIDENCE FOR PRACTICE GUIDES

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IES LEVELS OF EVIDENCE FOR PRACTICE GUIDES

Table B.1. Institute of Education Sciences Levels of Evidence for Practice Guides

Criteria	STRONG Evidence Base	MODERATE Evidence Base	MINIMAL Evidence Base
Validity	High internal validity (high quality causal designs). Studies must meet WWC standards with or without reservations. ^a AND High external validity (requires multiple studies with high quality causal designs that represent the population on which the recommendation is focused). Studies must meet WWC standards with or without reservations.	High internal validity but moderate external validity (i.e., studies that support strong causal conclusions, but generalization is uncertain). OR High external validity but moderate internal validity (i.e., studies that support the generality of a relation, but the causality is uncertain). ^b	The research may include evidence from studies that do not meet the criteria for moderate or strong evidence (e.g., case studies, qualitative research).
Effects on Relevant Outcomes	Consistent positive effects without contradictory evidence (i.e., no statistically significant negative effects) in studies with high internal validity.	A preponderance of evidence of positive effects. Contradictory evidence (i.e., statistically significant negative effects) must be discussed by the panel and considered with regard to relevance to the scope of the guide and intensity of the recommendation as a component of the intervention evaluated.	There may be weak or contradictory evidence of effects.
Relevance to Scope	Direct relevance to scope (i.e., ecological validity)—relevant context (e.g., classroom vs. laboratory), sample (e.g., age and characteristics), and outcomes evaluated.	Relevance to scope (ecological validity) <u>may vary</u> , including relevant context (e.g., classroom vs. laboratory), sample (e.g., age and characteristics), and outcomes evaluated. At least some research is directly relevant to scope (but the research that is relevant to scope does not qualify as “Strong” with respect to validity).	The research may be out of the scope of the practice guide.

Criteria	STRONG Evidence Base	MODERATE Evidence Base	MINIMAL Evidence Base
Relationship Between Research and Recommendations	Direct test of the recommendation in the studies or the recommendation is a major component of the intervention tested in the studies.	Intensity of the recommendation as a component of the interventions evaluated in the studies <u>may vary</u> .	Studies for which the intensity of the recommendation as a component of the interventions evaluated in the studies is low; and/or the recommendation reflects expert opinion based on reasonable extrapolations from research.
Panel Confidence	Panel has a high degree of confidence that this practice is effective.	The panel determines that the research does not rise to the level of strong but is more compelling than a minimal level of evidence. Panel may not be confident about whether the research has effectively controlled for other explanations or whether the practice would be effective in most or all contexts.	In the panel's opinion, the recommendation must be addressed as part of the practice guide; however, the panel cannot point to a body of research that rises to the level of moderate or strong.
Role of Expert Opinion	Not applicable.	Not applicable.	Expert opinion based on defensible interpretations of theory (theories). (In some cases, this simply means that the recommended practices would be difficult to study in a rigorous, experimental fashion; in other cases, it means that researchers have not yet studied this practice.)
When Assessment Is the Focus of the Recommendation	For assessments, meets the standards of <i>The Standards for Educational and Psychological Testing</i> . ^c	For assessments, evidence of reliability that meets <i>The Standards for Educational and Psychological Testing</i> but with evidence of validity from samples not adequately representative of the population on which the recommendation is focused.	Not applicable.

^aThis includes randomized control trials (RCTs) and quasi-experimental designs (QEDs). Studies not contributing to levels of evidence include single case designs (SCDs) evaluated with WWC pilot SCD standards and regression discontinuity.

^bThe research may include studies generally meeting WWC standards and supporting the effectiveness of a program, practice, or approach with small sample sizes and/or other conditions of implementation or analysis that limit generalizability. The research may include studies that support the generality of a relation but do not meet WWC standards; however, they have no major flaws related to internal validity other than lack of demonstrated equivalence at pretest for QEDs. QEDs without equivalence must include a pretest covariate as a statistical control for selection bias. These studies must be accompanied by at least one relevant study meeting WWC standards.

^cAmerican Educational Research Association, American Psychological Association, and National Council on Measurement in Education. *The Standards for Educational and Psychological Testing*. Washington, DC: AERA Publications, 1999.

APPENDIX C

IES-SPECIFIC PROCEDURES (CONFLICT OF INTEREST AND AUTHORSHIP)

APPENDIX C

IES-SPECIFIC PROCEDURES (CONFLICT OF INTEREST AND AUTHORSHIP)

Conflict of interest disclosure. Given the central importance of the WWC, the National Center for Education Evaluation and Regional Assistance has established separate guidelines regarding actual or perceived conflicts of interest specific to the WWC. The intention of this process is to protect the WWC and the practice guide team from situations in which reports and products could be reasonably questioned, discredited, or dismissed due to apparent or actual conflicts of interest, and to maintain standards for high quality, unbiased policy research and analysis. All WWC practice guide team members, including the panel chair, panelists, coordinators, and reviewers are required to complete and sign a form identifying whether or not potential conflicts of interest exist. Conflicts for all tasks must be disclosed before any work is started, and practice guide team members again complete and submit conflict of interest forms before the guide is published on the WWC website.

Authorship release. Although all panel members bring their expertise to bear in developing the practice guide, to speed the process of revisions, panel members complete an authorship form that enables an identified writer (usually, the key staff leader) to make changes and edits to the document to address comments and concerns from peer review.