Strategies for Increasing Literacy Among Elementary Students

PART 1:

Review of Recommendations

Recommendation 1.
Provide daily time for students to write.

Recommendation 2.
Teach students to use the writing process for a variety of purposes.

Recommendation 2a.
Teach students the writing process.

1. Teach students strategies for the various components of the writing process.
2. Gradually release writing responsibility from the teacher to the student.
3. Guide students to select and use appropriate writing strategies.
4. Encourage students to be flexible in their use of the components of the writing process.

Recommendation 2b.
Teach students to write for a variety of purposes.

1. Help students understand the different purposes of writing.
2. Expand students' concept of audience.
3. Teach students to emulate the features of good writing.
4. Teach students techniques for writing effectively for different purposes.

Recommendation 3.
Teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing.

1. Teach very young writers how to hold a pencil correctly and form letters fluently and efficiently.
2. Teach students to spell words correctly.
3. Teach students to construct sentences for fluency, meaning, and style.
4. Teach students to type fluently and to use a word processor to compose.

Recommendation 4.
Create an engaged community of writers.

1. Teachers should participate as members of the community by writing and sharing their writing.
2. Give students writing choices.
3. Encourage students to collaborate as writers.
4. Provide students with opportunities to give and receive feedback throughout the writing process.
5. Publish students' writing, and extend the community beyond the classroom.

Levels of Evidence for Practice Guides

Institute of Education Sciences Levels of Evidence for Practice Guides

This section provides information about the role of evidence in Institute of Education Sciences' (IES) What Works Clearinghouse (WWC) practice guides. It describes how practice guide panels determine the level of evidence for each recommendation and explains the criteria for each of the three levels of evidence (strong evidence, moderate evidence, and minimal evidence).

The level of evidence assigned to each recommendation in this practice guide represents the panel's judgment of the quality of the existing research to support a claim that, when these practices were implemented in past research, positive effects were observed on student outcomes. After careful review of the studies supporting each recommendation, panelists determine the level of evidence for each recommendation using the criteria in 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.[1] 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. It also might be that the 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. In some cases, this simply means that the recommended practices would be difficult to study in a rigorous, experimental fashion;[2] in other cases, it means that researchers have not yet studied this practice, or that there is weak or conflicting evidence of effectiveness. 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 developing the levels of evidence, the panel considers each of the criteria in Table 1. The level of evidence rating is determined as the lowest rating achieved for any individual criterion. Thus, for a recommendation to get a strong rating, the research must be rated as strong on each criterion. If at least one criterion receives a rating of moderate and none receive a rating of minimal, then the level of evidence is determined to be moderate. If one or more criteria receive a rating of minimal, then the level of evidence is determined to be minimal.

Table 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.[3] **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).[4]	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) may vary, 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.
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 may vary.	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.

(continued)

Table 1. Institute of Education Sciences levels of evidence for practice guides *(continued)*

Criteria	STRONG Evidence Base	MODERATE Evidence Base	MINIMAL Evidence Base
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 *The Standards for Educational and Psychological Testing.*[5]	For assessments, evidence of reliability that meets *The Standards for Educational and Psychological Testing* but with evidence of validity from samples not adequately representative of the population on which the recommendation is focused.	Not applicable

The panel relied on WWC evidence standards to assess the quality of evidence supporting educational programs and practices. The WWC evaluates evidence for the causal validity of instructional programs and practices according to WWC standards. Information about these standards is available at http://ies.ed.gov/ncee/wwc/documentsum.aspx?sid=19. Eligible studies that meet WWC evidence standards for group designs or meet evidence standards with reservations are indicated by **bold text** in the endnotes and references pages.

Introduction

Introduction to the *Teaching Elementary School Students to Be Effective Writers* Practice Guide

This section provides an overview of the importance of teaching writing and explains key parameters considered by the panel in developing the practice guide. It also summarizes the recommendations for readers and concludes with a discussion of the research supporting the practice guide.

"Writing today is not a frill for the few, but an essential skill for the many."[6]

Writing is a fundamental part of engaging in professional, social, community, and civic activities. Nearly 70 percent of salaried employees have at least some responsibility for writing,[7] and the ability to write *well* is a critical component of being able to communicate effectively to a variety of audiences. Because writing is a valuable tool for communication, learning, and self-expression,[8] people who do not have adequate writing skills may be at a disadvantage and may face restricted opportunities for education and employment.

Students should develop an early foundation in writing in order to communicate their ideas effectively and efficiently—yet many American students are not strong writers. In fact, less than one-third of all students performed at or above the "proficient" level in writing on the 2007 National Assessment of Educational Progress Writing Assessment.[9]

The authors believe that students who develop strong writing skills at an early age acquire a valuable tool for learning, communication, and self-expression. Such skills can be developed through effective writing instruction practices that provide adequate time for students to write.[10] This guide, developed by a panel of experts, presents four recommendations that educators can use to increase writing achievement for elementary students and help them succeed in school and society. These recommendations are based on the best available research evidence, as well as the combined experience and expertise of the panel members.

Scope of the practice guide

Audience. This guide is intended for use by teachers, literacy coaches, and other educators. The recommendations focus on activities and strategies teachers can implement in their classrooms to increase their students' writing achievement. Principals, districts, and curriculum developers may also find the guide useful.

Grade level. The recommendations provide strategies for teaching writing to students in elementary school. The panel acknowledges that instructional practices in kindergarten and 1st grade, when students are just beginning to learn letters and to write, can and will differ from practices in later grades. Writing, like reading, is defined from a developmental standpoint, which begins with the acquisition of foundational skills and then leads to the application of more sophisticated techniques. For younger students, for example, "writing" activities could include interpretive drawing, invented spelling, or interactive writing. Although these activities are not often considered traditional writing experiences, they accomplish the same goals: helping students communicate thoughts and ideas to others, encouraging them to engage with the text to deepen their understanding of the content, and drawing connections to prior learning experiences. The panel recommends that teachers adapt the recommendations as appropriate for the range of grades addressed in this guide, and examples of such adaptations are included in the guide.

Populations who are at risk for writing difficulties. Learning to write can be particularly challenging for students with learning disabilities; those who find it difficult to regulate their behavior when they become frustrated; or those who struggle with related skills such as reading, spelling, or handwriting. While the recommendations in this guide are primarily intended for teachers to use with typically developing students, most teachers serve at least a few students with special needs in their classrooms; in some general education classrooms, these students comprise the majority. Research evidence reviewed for this guide indicates that the recommendations are appropriate for use with students with special needs when accompanied by appropriate modifications.

Common themes

Underlying this guide are three common themes about the concept of writing, the role of technology, and the role of assessment.

The writing process. Writing is a process through which people communicate thoughts and ideas. It is a highly complex, cognitive, self-directed activity, driven by the goals writers set for what they want to do and say and the audience(s) for whom they are writing. To meet these goals, writers must skillfully and flexibly coordinate their writing process from conception to the completion of a text. Components of the writing process include planning; drafting; sharing; revising; editing; evaluating; and, for some writing pieces, publishing. (See Recommendation 2 for more information.)

Technology. Increasingly, the ability to use technology is vital for success in school and contemporary life. This requires that students learn to type and use a word processor, use the Internet to collect information, navigate computer- and web-based testing tools, and understand how different writing conventions apply to different media. The panel believes that integrating the use of technology into writing instruction is critically important. For this reason, examples of how to do so are included in "technology tip" call-out boxes in this guide.

Assessment. Good instruction in any subject area requires that teachers continually assess the needs and skills of their students and modify their instruction to suit those needs. The panel encourages teachers to use assessment to guide their instruction and to determine when students are ready to move on to more challenging instruction.

Summary of the recommendations

The recommendations in this guide cover teaching the writing process, teaching fundamental writing skills, encouraging students to develop essential writing knowledge, and developing a supportive writing environment. All of these practices are aimed at achieving a single goal: enabling students to use writing flexibly and effectively to help them learn and communicate their ideas.

A central tenet of this guide is that students learn by doing. Indeed, to become effective writers, students need daily opportunities to learn and practice writing skills, strategies, and techniques (Recommendation 1). Writing practice also can be integrated into instruction in other content areas to provide students with additional time to write.

Students need to think carefully about their purpose for writing, planning what to say and how to say it (Recommendation 2). While evidence supports Recommendation 2 as a whole, the steps to carry out this recommendation can be grouped into two categories. First, to help students think critically about writing, teachers should focus their writing instruction on teaching students to carry out the writing process effectively and flexibly (Recommendation 2a). This includes helping students learn how to engage in the writing process to meet their writing goals, as well as teaching students multiple strategies for carrying out the components of

the writing process. Second, because writing also is a form of communication with many purposes, teachers should help students develop an understanding of these purposes and learn to write well for a variety of real-life purposes and audiences (Recommendation 2b).

Writing places multiple simultaneous demands on the writer. Mastering the foundational skills of good writing, including handwriting, spelling, sentence construction, and typing, allows students to devote more of their attention to composing written texts by utilizing the strategies and techniques associated with the writing process. For this reason, it is important to teach students foundational skills (Recommendation 3).

When students are part of a community of writers, they collaborate with other writers, make decisions about what to write and how to write about it, and receive constructive feedback from peers and teachers. Teachers should create a supportive and motivating environment so that young writers feel safe engaging fully in the writing process (Recommendation 4).

Defining and assessing good writing

Writing instruction is ultimately geared toward teaching students to produce high-quality writing for a variety of purposes. To assess whether the practices in this guide were effective, the panel considered their impact on overall writing quality. However, given that the students targeted by this guide are in the early stages of their writing development, and that the cost of administering and scoring assessments of overall writing quality can be prohibitive, the panel also considered the impact of practices on intermediary outcomes—including genre elements, ideation, mechanics, sentence structure, organization, output, vocabulary, and voice (see the glossary for descriptions and examples of each outcome). When measures of overall writing quality and measures of intermediary outcomes were both available, the panel prioritized evidence on overall writing quality.

> Measures of **overall writing quality** assess the effectiveness of a piece of writing. These measures may take into account assessments of intermediary outcome categories—including writing output, mechanics, vocabulary, sentence structure, organization, ideation, voice, and genre (or text) elements—in a single assessment of the quality of a piece of writing.

One challenge for teachers and researchers alike is identifying what constitutes good writing. Unlike instruction in basic mathematics, where there typically is a correct answer and an incorrect answer, what constitutes good writing in one context is not always good writing in another. Assessing writing is a fundamentally subjective judgment and depends at least in part on the framework the reader brings to the task. Despite the subjective nature of writing assessment, there are some features that many can agree contribute to effective writing (e.g., following basic language conventions so a reader is able to interpret the text's meaning or developing a clear focus for the reader). In order to address some of the inherent subjectivity of writing measures, the panel included only outcomes for which the researchers demonstrated that multiple raters could evaluate the same students' work consistently. Exceptions were given to norm-referenced standardized tests and a small number of measures that were more objective (e.g., word count).

Use of research

The literature used to create and support the recommendations ranges from rigorous experimental studies to expert reviews of practices and strategies in writing; however, the evidence ratings are based solely on high-quality experimental and quasi-experimental design studies that met What Works Clearinghouse (WWC) standards. These studies include both national and international studies of strategies for teaching writing to students in kindergarten through 6th grade.

Single-case design (SCD) studies that meet the WWC pilot standards for well-designed SCD research are also described, but these cannot raise the level of evidence above minimal.

The research base for this guide was identified through a comprehensive search for studies evaluating instructional practices for improving students' writing skills and techniques. An initial search for literature related to writing instruction and strategies in the past 20 years, supplemented with recommendations by the panel (including important studies conducted in 1970 or later), yielded more than 1,500 citations. Of these studies, 118 used experimental and group quasi-experimental designs to examine whether components of writing instruction increased students' writing achievement. From this subset, 41 met the causal validity standards of the WWC, and 34 were relevant to the panel's recommendations and were included as support or supplemental evidence for the recommendations in this practice guide.[11]

The strength of the evidence supporting each recommendation in this guide varies; one recommendation was supported by strong evidence, one by moderate evidence, and the remaining two recommendations by minimal evidence. Despite the varying levels of evidence, the panel believes that all of the recommendations in this guide are important for promoting students' writing achievement.

A rating of minimal evidence does not indicate that the practices described in a recommendation are ineffective or that the recommendation is any less important than the recommendations with ratings of strong or moderate evidence. Instead, it may indicate that little research has been conducted on the practices (or the combination of practices) described in the recommendation. Some of the evidence used to supplement the evidence of the effectiveness of the recommendations on typically achieving students comes from interventions administered to students who have been identified for special education services or who score below average on assessments of related skills.

Although all of the recommendations in this guide are primarily based on evidence from studies with rigorous designs, the panel members supplemented their explanation of how to execute the recommendations based on their expert judgment and experience applying the recommendations. Throughout the guide, statements not cited with studies are based on the panel's judgment.

Table 2 shows each recommendation and the strength of the evidence that supports it as determined by the panel. Following the recommendations and suggestions for carrying out the recommendations, Appendix D presents more information on the research evidence that supports each recommendation.

Table 2. Recommendations and corresponding levels of evidence

Recommendation	Levels of Evidence		
	Strong Evidence	Moderate Evidence	Minimal Evidence
1. Provide daily time for students to write.			◆
2. Teach students to use the writing process for a variety of purposes. 2a. Teach students the writing process. 2b. Teach students to write for a variety of purposes.	◆		
3. Teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing.		◆	
4. Create an engaged community of writers.			◆

Provide daily time for students to write.

Providing adequate time for students to write is one essential element of an effective writing instruction program.[12] However, recent surveys of elementary teachers indicate that students spend little time writing during the school day.[13] Students need dedicated instructional time to learn the skills and strategies necessary to become effective writers, as well as time to practice what they learn. Time for writing practice can help students gain confidence in their writing abilities. As teachers observe the way students write, they can identify difficulties and assist students with learning and applying the writing process.

Summary of evidence: Minimal Evidence

While the panel believes it is critical to allocate sufficient time to writing instruction and practice, research has not explicitly examined whether providing daily opportunities to write leads to better writing outcomes than providing less frequent writing opportunities. One study did conclude that students who were given extra instructional time in writing had improved writing quality relative to students who did not receive extra instruction.[14]

In addition to this study, the research supporting the practices recommended in the remainder of this guide implies that the practices required considerable time to implement.[15] Merely providing time for writing is insufficient, however; the time for writing must include instruction aligned with the recommendations that follow.

The panel next describes how to carry out this recommendation.

How to carry out the recommendation

The panel recommends a minimum of one hour a day devoted to writing for students, beginning in 1st grade. The hour should include at least 30 minutes dedicated to teaching a variety of writing strategies, techniques, and skills appropriate to students' levels, as detailed in Recommendations 2, 3, and 4 of this guide. The remaining 30 minutes should be spent on writing practice, where students apply the skills they learned from writing-skills instruction.

Time for writing practice can occur in the context of other content-area instruction. In science, for example, lab reports require detailed procedural writing and clear descriptions of observations. Students also can write

> For students in kindergarten, at least 30 minutes each day should be devoted to writing and developing writing skills.

imaginary diary entries of people from the time period they are studying in social studies. Additionally, students can write before, during, and/or after reading, to articulate what they already know, what they want to know, and what they learned. When teachers integrate writing tasks with other content-area lessons, students may think more critically about the content-area material.[16]

Potential roadblocks and solutions

Roadblock 1.1. *There is not enough time in the school day to devote an hour each day to writing instruction.*

Suggested Approach. Teachers should integrate writing and content-area instruction wherever possible in order to maximize instructional time and give students more writing practice. The panel recognizes that educators face limited time and a number of conflicting priorities in each school day; however, it is important for teachers to provide as

much time as possible for writing instruction and in-class composing. In fact, teachers can use writing to augment instruction in other subject areas. For example, if students are learning to interpret graphs in math, teachers can present students with a graph from a recent newspaper and ask them to write a paragraph about what the graph is trying to convey. This exercise encourages students to think carefully about how effectively the graph conveys information, and at the same time, it gives students an opportunity to apply and practice writing strategies and skills.

Teach students to use the writing process for a variety of purposes.

Writing well involves more than simply documenting ideas as they come to mind. It is a process that requires that the writer think carefully about the purpose for writing, plan what to say, plan how to say it, and understand what the reader needs to know.

Teachers can help students become effective writers by teaching a variety of strategies for carrying out each component of the writing process[17] and by supporting students in applying the strategies until they are able to do so independently.[18] Over time, students will develop a repertoire of strategies for writing. Teachers should explain and model the fluid nature in which the components of the writing process work together, so that students can learn to apply strategies flexibly—separately or in combination—when they write.[19]

Students also should learn that writing is used for a variety of purposes, such as conveying information, making an argument, providing a means for self-reflection, sharing an experience, enhancing understanding of reading, or providing entertainment. Learning how to write well for different purposes is important not only for success in school, but also for active participation in professional and social life. Teachers should begin by teaching students the different purposes for writing[20] and how specific genres, or forms of writing defined by specific features, can help students achieve their writing goals. When students understand the connection between different genres and writing purposes, they may be more likely to use different genres and think more critically about how to structure their writing. Students also must learn to adjust their writing to be most effective for their intended readers.[21] Examples of good writing and techniques for writing in specific genres can help students write more effectively for different purposes and audiences.[22]

Because writing is a complex process, the steps needed to carry out this recommendation are numerous. For that reason, the individual how-to steps are separated into two sections. Recommendation 2a discusses teaching students how to apply the writing process; Recommendation 2b addresses teaching students to write for a variety of purposes. Because research has examined all of these steps combined, we summarize and rate the evidence supporting all of Recommendation 2 below.

Genres are forms of writing with specific features that provide context and structure for a purpose. For example, a student might want to *describe* a warm summer day. To achieve this purpose, the student might choose to write a poem or a journal entry. Both genres (poem and journal entry) enable the student to communicate the purpose, but they do so in different ways. Writers use genres to achieve a wide variety of writing purposes.

Summary of evidence: Strong Evidence

The panel determined that there was strong evidence supporting this recommendation. Twenty-five studies that met WWC evidence standards tested the practices in this recommendation on diverse populations of students across a wide variety of settings and found positive effects on a variety of outcomes, including overall writing quality.[23]

The outcomes for typically achieving students on measures administered in a whole-class setting are the focus of this summary, but more details on the impacts on other groups and settings can be found in Appendix D. The studies can be placed into four categories, based on the practices they examine. The first two categories of studies evaluated specific interventions that were addressed by a large number of studies. The remaining studies examined a range of interventions with varied components and are therefore grouped by the degree of alignment between the studied practices and the recommendation:

- *Self-regulated strategy development (SRSD).*[24] The first set of studies examined SRSD, an approach to writing instruction, which typically contains more than 70 percent of the specific practices detailed in this recommendation In the SRSD approach, students are taught different strategies and techniques using a gradual release of responsibility to help them navigate the writing process and to regulate their writing behavior.[25] Studies of SRSD showed uniformly positive effects on writing outcomes, including the overall quality of students' writing.[26]

- *Goal setting.* These studies examined an approach whereby students receive a variety of concrete goals to help them improve the quality of their writing.[27] Typically, goal-setting interventions contained fewer than 30 percent of the components of Recommendation 2. No studies examined the effectiveness of goal setting among typically achieving students in a whole-class setting. The effects of goal setting on overall writing quality were positive when administered to typically achieving students in small groups, although the effects on the quality of the sentences that students wrote were less clear.[28]

- *Moderately or closely aligned to the recommendation.* These studies did not fall in either of the previous categories but examined interventions that contained at least 30 percent of the components of Recommendation 2.[29] The practices in these studies produced positive effects on the overall quality of students' writing, as well as the number of genre elements that students included in their stories.[30]

- *Partially aligned to the recommendation.* The final category of studies examined interventions that contained fewer than 30 percent of the components of Recommendation 2.[31] The study of a typically achieving population found positive impacts on students' overall writing quality and the number of elements they included in their stories.[32]

A majority of studies examined SRSD and goal-setting interventions. The studies also showed that the practices in this recommendation are effective when tested on students with characteristics that make them at risk for writing difficulties or students who have been labeled as gifted. Interventions delivered to students in a whole-class setting sometimes led to smaller gains in students' writing; however, the practices proved to be effective regardless of the mode of delivery.

The panel describes the four components of Recommendation 2a and the four components of Recommendation 2b after explaining the writing process on the next page.

Understanding the Writing Process

The writing process is the means through which a writer composes text. Writing is not a linear process, like following a recipe to bake a cake. It is flexible; writers should learn to move easily back and forth between components of the writing process, often altering their plans and revising their text along the way. Components of the writing process include planning, drafting, sharing, evaluating, revising, and editing. An additional component, publishing, may be included to develop and share a final product.

Planning often involves developing goals and generating ideas; gathering information from reading, prior knowledge, and discussions with others; and organizing ideas for writing based on the purpose of the text (see Recommendation 2b for more information about writing for a variety of purposes). Students should write down these goals and ideas so that they can refer to and modify them throughout the writing process.

Drafting focuses on creating a preliminary version of a text. When drafting, students must select the words and construct the sentences that most accurately convey their ideas, and then transcribe those words and sentences into written language. Skills such as spelling, handwriting, and capitalization and punctuation also are important when drafting, but these skills should not be the focus of students' effort at this stage (see Recommendation 3 for more information about these skills).

Sharing ideas or drafts with teachers, other adults, and peers throughout the writing process enables students to obtain feedback and suggestions for improving their writing.

Evaluating can be carried out by individual writers as they reread all or part of their text and carefully consider whether they are meeting their original writing goals. Evaluation also can be conducted by teachers and peers who provide the writer with feedback

Technology Tip

Word processing can make it easier for many students to carry out the writing process. For instance, text can be added, moved, deleted, or rewritten easily, encouraging students to move flexibly between components of the writing process. Some software programs help students organize their ideas for writing, provide feedback on what they write, and allow students to publish their writing in a variety of forms and formats.

(see Recommendation 4 for more information about providing students with opportunities to give and receive feedback throughout the writing process).

Revising and editing require that writers make changes to their text based on evaluations of their writing. **Revising** involves making content changes after students first have evaluated problems within their text that obscure their intended meaning. Students should make changes to clarify or enhance their meaning. These changes may include reorganizing their ideas, adding or removing whole sections of text, and refining their word choice and sentence structure.

Editing involves making changes to ensure that a text correctly adheres to the conventions of written English. Students should be particularly concerned with reviewing their spelling and grammar and making any necessary corrections. Editing changes make a text readable for external audiences and can make the writer's intended meaning clearer.

Publishing typically occurs at the end of the writing process, as students produce a final product that is shared publicly in written form, oral form, or both. Not all student writing needs to be published, but students should be given opportunities to publish their writing and celebrate their accomplishments (see Recommendation 4 for more information about publishing students' writing).

Recommendation 2a. Teach students the writing process.

How to carry out the recommendation

1. Teach students strategies for the various components of the writing process.

Students need to acquire specific strategies for each component of the writing process.[33] Table 3 shows 10 examples of writing strategies and the grades for which they are appropriate. Students should learn basic strategies, such as POW (Pick ideas, Organize their notes, Write and say more), in 1st or 2nd grade. More complicated strategies, such as peer revising, should be introduced in 2nd grade or later. Many strategies can be used to assist students with more than one component of the writing process. For example, as students plan to write a persuasive essay, they may set goals for their writing, such as providing three or more reasons for their beliefs. Students should

> A **strategy** is a series of actions (mental, physical, or both) that writers undertake to achieve their goals. Strategies are tools that can help students generate content and carry out components of the writing process.

then devise a plan for periodically assessing their progress toward meeting these goals as they write. As students evaluate their draft text, they may reread their paper to determine whether they have met the goals they articulated during planning. If not, students may revise their writing to better meet their goals.

Table 3. Examples of writing strategies[34]

Component of the Writing Process	Writing Strategy	How Students Can Use the Strategy	Grade Range
Planning	POW	▪ **P**ick ideas (i.e., decide what to write about). ▪ **O**rganize their notes (i.e., brainstorm and organize possible writing ideas into a writing plan). ▪ **W**rite and say more (i.e., continue to modify the plan while writing).	1–6
	Ordering ideas/outlining	▪ Brainstorm/generate ideas for their paper. ▪ Review their ideas and place a number by what will go first, second, third, and so on.	1–2
		▪ Brainstorm/generate ideas for their paper. ▪ Decide which are main ideas and which are supporting ideas. ▪ Create an outline that shows the order of the main ideas and the supporting details for each main idea.	3–6
Drafting	Imitation	▪ Select a sentence, paragraph, or text excerpt and imitate the author's form (see Recommendation 2b, examples 2 and 3).	1–6
	Sentence generation	▪ Try out sentences orally before writing them on paper. ▪ Try multiple sentences and choose the best one. ▪ Use transition words to develop different sentence structures. ▪ Practice writing good topic sentences.	3–6
Sharing	Peer sharing[35]	▪ In pairs, listen and read along as the author reads aloud. ▪ Share feedback with their writing partner, starting with what they liked.	2–6
	"Author's Chair"	▪ Sit in a special chair in front of peers and read their writing (see Recommendation 4, example 6, for more detail).	K–6

Evaluating	Self-evaluating	▪ Reread and ask these questions:
		  • Are the ideas clear?
		  • Is there a clear beginning, middle, and end?
		  • Does the writing connect with the reader?
		  • Are sentence types varied?
			2–6

	Self-monitoring	▪ Self-assess and ask these questions, either out loud or internally:
		  • Did I meet the goals I developed for my writing? If not, what changes should I make to meet my goals?
		  • Did I correctly use strategies that were appropriate for this task? If not, what should I change?
		▪ Record their answers to self-assessment questions on a chart or teacher-provided questionnaire in order to track their progress toward writing goals and strategy use.
		▪ Congratulate themselves, and inform their teacher, when they meet their goals.
			3–6

Revising and editing	Peer revising[36]	▪ Place a question mark (?) by anything they do not understand in their writing partner's paper. ▪ Place a carat (^) anywhere it would be useful to have the author include more information.	2–6

	COPS (editing)	▪ Ask the COPS editing questions:
		  • Did I **C**apitalize the first word in sentences and proper names?
		  • How is the **O**verall appearance of my paper?
		  • Did I use commas and end-of-sentence **P**unctuation?
		  • Did I **S**pell each word correctly?
			2–6

2. Gradually release writing responsibility from the teacher to the student.

Writing strategies should be taught explicitly and directly through a gradual release of responsibility from teacher to student.[37] Teachers should ensure that students have the background knowledge and skills they need to understand and use a writing strategy. Then, teachers should describe the strategy and model its use. Teachers also should articulate the purpose of the strategy, clearly stating why students might choose to use it as a way of improving their writing. Teachers then should guide students to collaborate in small groups to practice applying the strategy.

Once students demonstrate an understanding of the strategy, the teacher should encourage students to practice applying it as they write independently. Teachers should make sure they do not release responsibility to students too early. In some cases, this may mean having students spend more time in activities that are teacher directed until they develop the knowledge and skills to become more independent. Conversely, if some students are particularly strong in understanding and applying a new strategy, teachers can create collaborative peer groups in which more adept students help peers better understand, use, and apply new strategies.

Figure 1 illustrates the gradual release of responsibility from teacher to student. In this scenario, the teacher uses brainstorming, a planning strategy. Brainstorming can be used with any grade level; students may brainstorm by writing words or drawing pictures to represent their ideas.
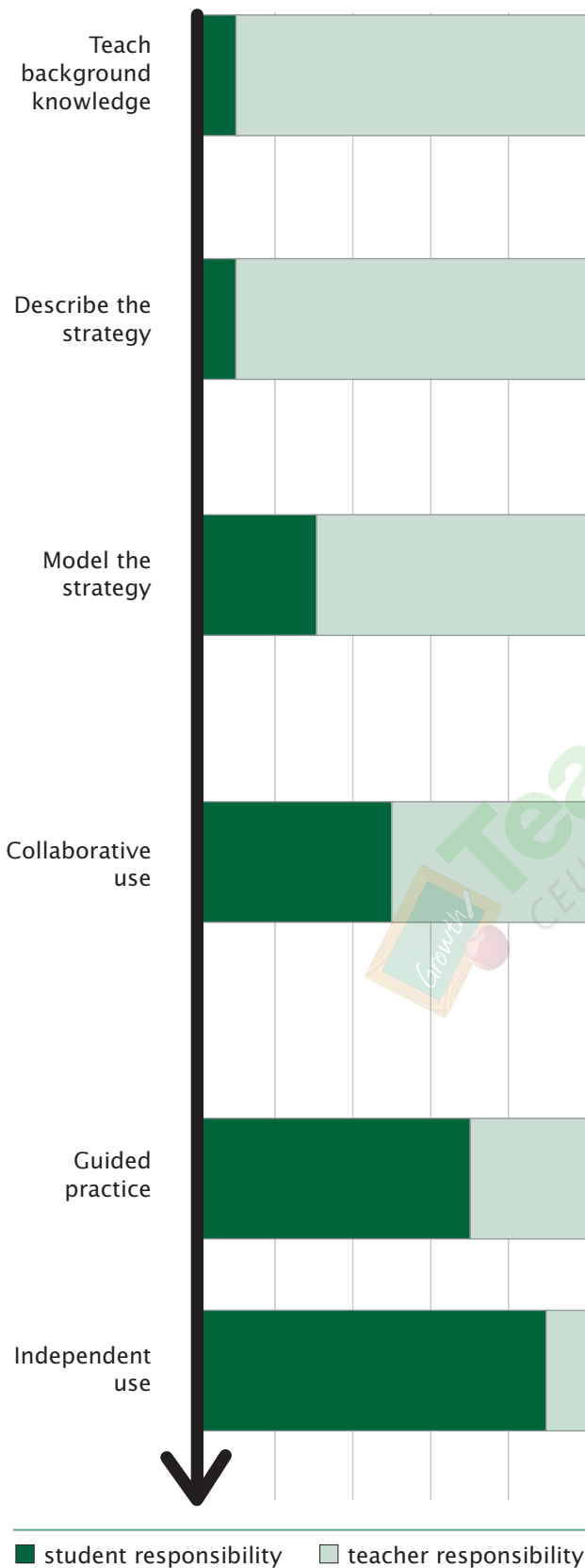
To adapt writing strategy instruction to individual students, teachers should assess students as they acquire new strategies, determining where instruction needs to be reinforced. Teachers may need to model an entire strategy or parts of a strategy again before students can work independently. Some students may need more time, practice, and assistance to master a strategy. While the amount of guided practice that individual students need will vary, practice is necessary for all students. In other words, it is not enough to simply describe the strategy and show how to use it.

For students who acquire a strategy easily and more quickly than their peers, teachers should consider increasing the complexity of the strategy. For example, teachers can increase the complexity of the brainstorming activity by additionally requiring students to research their topic online. Students also can explore using the strategy in new ways and with new tasks.

Figure 1. Gradual release of responsibility to students[38]

Sharing Responsibility for the Task

Teach background knowledge	
Describe the strategy	
Model the strategy	
Collaborative use	
Guided practice	
Independent use	

■ student responsibility □ teacher responsibility

Gradual Release of the Brainstorming Strategy

The teacher provides background knowledge, including why students should use the strategy and how it will help them: "What you write will be more interesting for others to read if you have a lot of good ideas, so you should take the time to write down all your ideas before you get started. One way to do this is to use a strategy called *brainstorming*. In brainstorming, you write down as many ideas as you can think of without worrying about whether they are good or bad."

The teacher describes the strategy: "Brainstorming helps you think about what you already know. You write down as many ideas as you can think of. You do not think about whether they are good or bad ideas while you do this. When you write down a lot of ideas, you may find some ideas that you didn't think about before. This is a good strategy to use when you don't have many ideas or when you aren't sure what you want to include in your writing."

The teacher models how to use the strategy, soliciting ideas from students: "I am going to show you how to brainstorm before writing a story on your topic. First, I will write down any idea that I think of about this topic. If I get stuck, I will keep thinking. I will not ask myself if an idea is a good one until I am done brainstorming. I will just write down any idea that pops into my head." *The teacher thinks aloud while modeling brainstorming, then asks:* "Does anyone else have any ideas to add to my list?"

Students collaborate in small groups to practice applying the strategy. The teacher explains: "I want each of you to pair up with another student. Before you start to write your story, the two of you should brainstorm as many ideas as you can for your paper on this topic. Remember not to worry about whether the ideas are good or bad. Right now, I just want you to focus on writing down as many ideas as you can." *While students practice using the strategy, the teacher checks to see that students are using the strategy properly and returns to earlier steps as needed.*

Students practice the strategy, with assistance from the teacher as needed. The teacher says: "Remember to brainstorm as many ideas as you can before you actually start writing your own paper." *While students generate their lists, the teacher walks around and assists students in applying the strategy.*

Students apply the strategy independently. The teacher reminds them: "Before you start to write, you should stop and ask if it will be helpful for you to use brainstorming to think about ideas for writing. Remember that brainstorming works well when you don't have many ideas or you aren't sure what you want to include in your writing." *If, in future lessons or on future topics, the teacher notices that students are having a hard time planning, he or she can remind students to use the brainstorming strategy.*

3. Guide students to select and use appropriate writing strategies.

When students initially learn to use writing strategies, teachers frequently should discuss when and how to use the strategies throughout the writing process, as well as why the strategies are helpful.[39] Once students learn to use a variety of strategies independently, through the gradual release process, teachers should help them understand how to select appropriate strategies and use them across a range of writing tasks.

To help students select the appropriate writing strategy, teachers might consider posting strategies on a wall chart in the classroom. One column of the chart might include a list of all the strategies, and another column might provide a list of situations in which these strategies could be used. Once students are able to use a strategy effectively and independently, they can identify and add situations to the chart. Students also can identify opportunities to apply strategies in different content areas.

Beyond knowing when and how to use a strategy, students must actually use it as they write. This can be facilitated by having students set a goal to use the strategy in one or more identified situations, followed by a discussion (and/or instruction) on how the strategy needs to be modified.[40] For example, planning strategies may vary based on the purpose of students' writing. Ordering ideas and outlining strategies lend themselves to report writing; brainstorming strategies can be useful for narrating; and setting goals, particularly audience goals, can help students improve their persuasive writing (see Recommendation 2b for information about teaching students to write for a variety of purposes). Students should evaluate their success in applying the strategy to the new situation and should consider how they can make the strategy work even better.[41]

4. Encourage students to be flexible in their use of the components of the writing process.

Writing requires flexibility and change. Once students have acquired a set of strategies to carry out the components of the writing process, they need to be purposeful in selecting strategies that help them meet their writing goals. They also need to learn to apply these strategies in a flexible manner,[42] moving back and forth between different components of the writing process as they develop text and think critically about their writing goals. For example, plans and already written text may need to be revised and edited numerous times to communicate more effectively, and

writing must be polished to make it suitable for publication.

Teachers should engage students in writing activities in which the writing process does not move in a lockstep fashion from planning to drafting to revising to editing to publishing. Rather, teachers should design activities in which students are encouraged to move back and forth between the components of the writing process as their text takes shape (see Example 1).

Example 1. Applying the writing process in an upper elementary classroom

---

Operation Robot

Students in grades 4 through 6 wrote about robots as part of a class project.[43]

Process of Writing

- The class discussed robots and what robots could do if they had certain specialty parts, such as telescopes on their heads to see great distances. Prompts such as toy robots and pictures of robots were used to spark discussion (**planning**).

- Students created robot diagrams with vivid pictures and written descriptions of their robots (**drafting**). Students then wrote stories about their robots, explaining how they became friends and what they do together (**drafting**). They used their diagrams to help them describe their robots in the stories.

- Each student shared his or her story with another student (**sharing**), who provided positive and constructive feedback (**evaluating**). The students then revised their stories using the feedback, along with their own evaluation of their texts (**revising and evaluating**).

- Students read their stories aloud in class (**sharing**). The class commented on what they liked and asked questions about anything that was unclear (**evaluating**). Students again **revised** their stories and were invited to **publish** them in a class book about robots.

Recommendation 2b. Teach students to write for a variety of purposes.

How to carry out the recommendation

1. Help students understand the different purposes of writing.

Students should understand the purpose of each genre so that they can select the genre best suited to their writing task.[44] In teaching a particular genre, teachers should emphasize the purpose of that genre and how its features are related to the purpose. Teachers also should relate genres to real-world scenarios. For example, the purpose of a persuasive letter is to convince the reader to agree with the writer. To achieve this purpose, writers should think of compelling reasons for readers who might not agree, then state those reasons clearly and support them with appropriate evidence. In class, teachers might provide a real-world scenario of students writing a persuasive letter to convince their parents that a friend should be allowed to spend the night, or a letter to the principal asking for permission to go on a special field trip. Table 4 provides examples of specific genres within four purposes: describe, narrate, inform, and persuade/analyze. Although the table links genres to specific purposes, teachers should note that many genres can be used for various purposes. For example, a letter can be written to persuade someone to do something, to narrate an event to a friend, or to inform a family member about an upcoming event.

Table 4. Purposes for writing

Purpose	Explanation[45]	Examples of Genres
Describe	to describe something, such as a person, place, process, or experience, in vivid detail	▪ descriptions (e.g., people, places, or events) ▪ character sketches ▪ nature writing ▪ brochures (personal, travel, and so on)
Narrate	to tell a story of an experience, event, or sequence of events while holding the reader's interest	▪ diary entries (real or fictional) ▪ folktales, fairy tales, fables ▪ short stories ▪ poems ▪ eyewitness accounts
Inform	to examine previously learned information or provide new information	▪ summaries of new or previously learned information ▪ instructions or directions ▪ letters ▪ newspaper articles ▪ science reports
Persuade/analyze	to give an opinion in an attempt to convince the reader that this point of view is valid or to persuade the reader to take a specific action (writing to express an opinion or make an argument has a similar purpose); to analyze ideas in text, for example, by considering their veracity or comparing them to one another	▪ persuasive essays ▪ editorials ▪ compare-and-contrast essays ▪ reviews (e.g., of books and movies) ▪ literary analysis

2. Expand students' concept of audience

Writing for different purposes often means writing for different audiences.[46] To help students understand the role of audience in writing, it is important to design writing activities that naturally lend themselves to different audiences. Otherwise, students may view writing in school as writing only for their teacher. When discussing writing purposes, teachers and students can generate a list of potential audiences for a given writing assignment. Students then can choose the audience that best fits their writing topic. For example, when writing persuasive letters, students could write for parents, friends, companies, or newspapers, depending on their chosen topic. When working on narratives, students could write a fable to read to preschool students. It is important that students' writing is shared with their intended audience.

Students should learn to adjust their tone and word choice to better convey their meaning and suit their audience. To develop this skill, students might write about the same topic for different audiences. For example, students could write a description of their favorite video game for a friend who also plays the game. Then, they could write a description for an adult, such as the school principal, who is unfamiliar with the game. Allowing students to write for a range of audiences enables them to think of writing as an authentic means of communication to accomplish a variety of goals.

Technology Tip

Find examples of exemplary texts online from the American Library Association's list of Newbery Medal award winners, the Database of Award-Winning Children's Literature (http://dawcl.com/introduction.html), or state department of education websites (e.g., http://www.cde.ca.gov/ci/rl/ll).

3. Teach students to emulate the features of good writing.

Students should be exposed to exemplary texts from a variety of sources, including published or professional texts, books and textbooks, the teacher's own writing, and peer samples.[47] Teachers should select texts that

- support the instructional goals of the lesson

- are appropriate for the students' reading levels and abilities

- provide exemplary models of what students will write

Exemplary texts can illustrate a number of features, including text structure; use of graphs, charts, and pictures; effective word choice; and varied sentence structure. For example, if the instructional goal is to teach 4th-grade students to describe a setting using concrete, sensory details, the teacher could read a chapter from E. B. White's *Charlotte's Web* in which the author uses sensory details, such as sights, sounds, smells, and movements, to bring a barn to life. Students then can apply what they learn to compose a rich, sensory description of their own setting.

Teachers should either read exemplary texts out loud or direct students to read and reread selected exemplary texts, paying close attention to the author's word choice, overall structure, or other style elements, based on the instructional goals of the lesson. Teachers should explain and students should discuss how each text demonstrates characteristics of effective writing in that particular genre. Students will then be prepared to emulate characteristics of exemplary texts at the word, sentence, and/or text level (see Example 2), or they can use the text as a springboard for writing (see Example 3).

Students of all ages can participate in emulating text activities. The closeness with which students will emulate the text, as well as the complexity and length of the text itself, will depend on the instructional goals of the lesson and on students' abilities. At the word level, for example, after reading *Rosie's Walk* (Example 2), teachers could introduce a variety of synonyms for the word *walk* and physically demonstrate the examples in front of the class. Students could then arrange the words in order from slow to fast (e.g., *trudge*, *amble*, *stroll*, *walk*, *stride*, *scurry*, and *run*). Students also could emulate sentences from the text, replacing synonyms in the sentences.

Struggling writers or students in lower grades may specifically focus on emulating sentence patterns or identifying and substituting words in appropriate places. Students should read a story, or have a story read to them, and then complete a story frame to create a story emulation (see Example 2).

In middle and upper elementary grades, students may use concepts in exemplary texts as a springboard for developing their own writing. In Example 3, 6th-grade students read the poem "Where I'm From," by George Ella Lyon. Using the structure of the text, they applied knowledge from a recent science lesson to create a poem about earthquakes.

Text emulating exercises can vary in length based on available instructional time, be assigned as homework, and/or be incorporated into activities across the curriculum. Once students are comfortable analyzing and emulating writing styles, they may be better able to enhance their own writing style, thinking critically about the meaning they wish to convey and the words they choose to convey that meaning.

Example 2. Story emulation of *Rosie's Walk* with 1st-grade students

Original text of *Rosie's Walk*, by Pat Hutchins[48]

> Rosie the hen went for a walk
> across the yard
> around the pond
> over the haystack
> past the mill
> through the fence
> under the beehives
> and got back in time for dinner.

Frame of *Rosie's Walk*, provided as a worksheet by the teacher

> _____ went for a _____
> across the _____
> around the _____
> over the _____
> past the _____
> through the _____
> under the _____
> and got back in time for _____ .

Text developed by a 1st-grade student

> **Ms. Foster the teacher** went for a **stroll**
> across the **playground**
> around the **jungle gym**
> over the **jump rope**
> past the **swings**
> through the **bicycle racks**
> under the **basketball hoop**
> and got back in time for **the morning message.**

Example 3. Using text as a model

Original text of "Where I'm From," by George Ella Lyon[49]	Text developed by a 6th-grade classroom[50]
I am from clothespins, from Clorox and carbon-tetrachloride. I am from the dirt under the back porch. (Black, glistening, it tasted like beets.) I am from the forsythia bush the Dutch elm whose long-gone limbs I remember as if they were my own. I'm from fudge and eyeglasses, from Imogene and Alafair. I'm from the know-it-alls and the pass-it-ons, from Perk up! and Pipe down! I'm from He restoreth my soul with a cottonball lamb and ten verses I can say myself. I'm from Artemus and Billie's Branch, fried corn and strong coffee. From the finger my grandfather lost to the auger, the eye my father shut to keep his sight. Under my bed was a dress box spilling old pictures, a sift of lost faces to drift beneath my dreams. I am from those moments— snapped before I budded— leaf-fall from the family tree.	I am from elastic strain, from the focus and the epicenter. I am from the destructive surface waves that run through the 40–200 kilometer fault zones. I am from the "Ring of Fire," the tectonic and lithospheric plates. I can cause tsunamis and fires. I am from convergent, divergent, and transform plate boundaries. I am from seismographs that determine my strength. I am from speedy but weak p-waves, from slow and hardy s-waves, but I do not reach. Seismic waves are caused by me. Who am I? An earthquake.

4. Teach students techniques for writing effectively for different purposes.

Students also must learn to use techniques that are specific to a purpose of writing.[51] Table 5 shows five examples of techniques specific to the four purposes for writing, accompanied by the grade levels for which the technique is appropriate. These techniques help students frame their writing for a specific purpose. When developing a persuasive essay, for example, students can use the TREE (Topic sentence, Reasons—three or more, Ending, Examine) technique, whereby they make a plan for their paper that includes what they believe, reasons to support their beliefs, examples for each reason, and an ending.[52]

Techniques should be taught explicitly and directly through a gradual release of responsibility from teacher to student until students are able to apply the techniques independently (see Recommendation 2a, Figure 1). Teachers should describe the technique, articulate how it relates to specific writing purposes, and model its use. Students should learn to select techniques that help them achieve their writing purpose and reach their target audience. Teachers should encourage students to practice applying the techniques as they flexibly use the components of the writing process. (See Recommendation 2a for more information on gradually releasing writing responsibility from the teacher to the student, teaching students to select and use techniques, and teaching students to use the components of the writing process flexibly.)

Potential roadblocks and solutions

Roadblock 2.1. *Students use strategies and techniques when they are first taught them, but over time, they stop using the strategies and techniques.*

Suggested Approach. When students transition to using strategies and techniques independently, teachers should continue to monitor student use of the strategies and techniques and assess whether students are appropriately applying them to components of the writing process and/or specific writing purposes. After teaching a strategy for planning, for example, teachers should check to see if students are using the strategy and if their planning skills are improving. If students are no longer using the strategy, but their planning skills have improved, it may mean they no longer need the strategy. Alternatively, if students continue to struggle with planning components of the writing process, the teacher may need to reteach the strategy to the whole class or provide more opportunities for collaborative practice for a small group of struggling students. Teachers also can ask students to monitor and report what strategies and techniques they used to develop and complete their text.

Roadblock 2.2. *State assessments ask students to write in only one or two genres, so time spent on other genres may not help them meet the assessment requirements.*

Suggested Approach. Regardless of current assessment practices in a particular state, it is important for students to learn to write for varied purposes. Writing for multiple purposes encourages preparation for high-stakes assessments, even if those assessments define the purposes of writing more narrowly. In fact, writing in one genre often calls on expertise from other types of writing. Writing a persuasive essay, for example, can involve providing a narrative example, drawing a comparison, or explaining a scientific concept in order to support a point. As teachers introduce new genres of writing, they can point out writing strategies or elements of writing that also transfer to other kinds of writing, including the types of writing required for the state writing assessment.

Table 5. Examples of techniques within the four purposes of writing

Purpose	Specific Technique	How Students Can Use the Technique	Grade Range
Describe	Sensory details	▪ Use their five senses, as applicable: • What did you *see*? How did it *look*? • What sounds did you *hear*? • What did you *touch*? How did it *feel*? • What could you *smell*? • What did you *taste*?	K–3
Narrate	Story grammar	▪ Consider the following questions when developing their story: • *Who* are the main characters? • *When* does the story take place? • *Where* does the story take place? • *What* do the main characters want to do? • *What* happens when the main characters try to do it? • *How* does the story end? • *How* does the main character feel?	1–3
		▪ In older grades, expand the strategy in the following ways: • Tell the story from the point of view of a character other than the main character. • Add an interesting or surprising twist to the story.	4–6
Inform	Report writing	▪ Complete a K-W-L chart: • What I **K**now • What I **W**ant to know • What I **L**earned ▪ In the K-W-L chart, gather appropriate information: • Brainstorm. (What do I know about the topic?) • Extend brainstorming. (What do I want to know about the topic? What other information would be helpful to learn about the topic?) • Gather additional information and add to the chart. (What have I learned? Did I list anything during brainstorming that was inaccurate and needs to be crossed off the chart?) ▪ Review the K-W-L chart and circle the most important ideas to include in the report. ▪ Develop an outline, showing which ideas will be included in the report and the order in which they will be presented. ▪ Continue planning while writing, gathering new information, and adding to the outline as needed. ▪ Be sure to implement each aspect of the plan as they write.	2–6
Persuade/ analyze	STOP DARE[53]	▪ Before they write, STOP and: • **S**uspend judgment. • **T**ake sides. • **O**rganize ideas. • **P**lan to adjust as they write. ▪ DARE to check their paper to be sure they have: • **D**eveloped their thesis. • **A**dded ideas to support their ideas. • **R**ejected arguments on the other side. • **E**nded with a strong conclusion.	4–6
	TREE	▪ As they write: • **T**ell what they believe. (State a topic sentence.) • Provide three or more **R**easons. (Why do I believe this?) • **E**nd it. (Wrap it up right.) • **E**xamine. (Do I have all my parts?)	2–3
		▪ In older grades, expand the strategy as follows: • Replace the **E**xamine step with **E**xplain reasons. (Say more about each reason.)	4–6

Teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing.

When basic writing skills become relatively effortless for students, they can focus less on these basic writing skills and more on developing and communicating their ideas.[54] However, younger writers must typically devote considerable attention to acquiring and polishing these skills before they become proficient.[55] Problems with basic writing skills have an impact on the quality of a person's writing.[56] Spelling skills can affect the words students choose because they may be less likely to use words they cannot spell.[57] Students also need to be able to generate strong, interesting sentences that vary in length and complexity in order to convey their intended meaning and engage readers.

When a student's writing contains spelling mistakes and poor handwriting, it can be difficult for the reader to understand what the student is trying to convey. Word-processing programs can make many aspects of the writing process easier for students, including assisting students with spelling and handwriting difficulties to write more fluently. Teaching typing can help students compose more easily on a computer, a skill that is increasingly necessary as computer-based technologies are used throughout daily life.

Handwriting, spelling, and sentence construction are all **basic writing skills** that students must draw upon to translate their thoughts and ideas into writing. Students also draw on typing and word processing skills when composing electronically.

Summary of evidence: Moderate Evidence

The panel determined that there is moderate evidence to support this recommendation. This evidence is drawn from nine studies of instruction in handwriting, spelling, sentence construction, and word processing.[58] The practices in the studies were closely related to those recommended by the panel. Three studies tested handwriting instruction—in which students were taught how to form letters and practiced writing the letters repeatedly in short sessions.[59] Three studies tested explicit instruction in phonological awareness, spelling phonics, morphological spelling, and word study.[60] Two studies tested sentence-construction interventions and examined the effectiveness of sentence-combining instruction and teaching students to apply standard writing conventions to their own writing;[61] and one study tested the effectiveness of practice using a word processor.[62] At least

five of the studies involved opportunities to apply the skills as students drafted original text (authentic writing).[63]

Eight of the nine studies found generally positive effects on outcomes such as spelling, handwriting, sentence structure, the quantity of text produced, and the overall quality of student writing.[64] However, in some of these studies, positive effects on one outcome were mixed with no effects or negative effects on another.[65] In the ninth study, which examined spelling instruction, no effects were found.[66]

Seven of the studies were conducted on populations the panel determined were at risk for writing difficulties,[67] and all but two[68] involved interventions delivered to pairs or small groups of students. The panel believes it is critical that teachers carefully match instruction in these skills to areas of student need. The panel cannot confirm that whole-class instruction without regard to varying student abilities will produce effects of the same magnitude.

The panel describes the four components of this recommendation below.

How to carry out the recommendation

1. Teach very young writers how to hold a pencil correctly and form letters fluently and efficiently.

Early writing instruction should begin with demonstrations of how to hold a pencil comfortably between the thumb and forefinger, resting on the middle finger.[69] Although many students will alter this grip over time,[70] a comfortable pencil grip is necessary in order to avoid fatigue, which can discourage students from writing.

Teachers also should show young writers the most efficient and legible ways to form each letter, regardless of whether print or cursive script is used.[71] Younger students may have a tendency to "draw" rather than to "write" letters, using more strokes than necessary to replicate the letter. Guided practice can be helpful, using letters with numbered arrows depicting the order and direction of each stroke. Handwriting-practice diagrams, such as the one depicted in Figure 2, can be downloaded for free from the Internet.

Students also should practice writing letters from memory. To do this, the teacher can show students the letter with numbered arrows and then cover the letter while the students practice writing it from memory. To help students commit the letter to memory, teachers gradually should increase the length of time the letter is covered before students write it.[72] Many handwriting curricula include

Figure 2. Handwriting-practice diagram
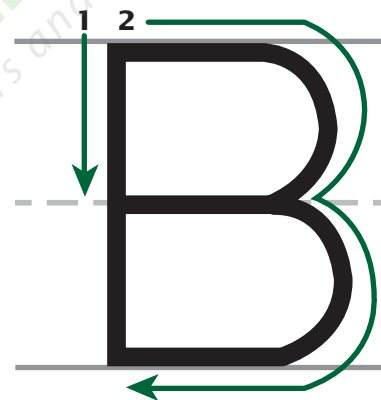
such diagrams and practice sheets for print and cursive, and some curricula may be available for little or no cost on the Internet. The specific curriculum is less important than teaching fluent, effortless letter formation.

Because handwriting is a motor skill, it works best to practice in multiple short sessions.[73] Students might practice a specific letter only five to eight times before moving to another activity. However, writing letters in isolation is insufficient; students also should apply their handwriting skills in sentences and in authentic writing activities.

2. Teach students to spell words correctly.

A relatively small number of words (850) account for 80 percent of the words elementary-grade students use in their writing.[74] Teachers should help students learn to spell words they commonly use.[75] Although many elementary schools have an explicit spelling curriculum, teachers should connect spelling instruction with writing as much as possible. Students should be encouraged to learn words they frequently misspell, as well as words they wish to include in their writing.

Teachers also should help students acquire the skills they need to generate and check plausible spellings for words.[76] Table 6 provides examples of lessons for developing spelling skills. When drafting, students should learn skills for applying spelling rules to words they wish to include, such as invented spelling or spelling by analogy. These skills allow students to generate an approximation of the spelling with minimal disruption to the generation of ideas.[77] When editing, students can also use spelling by analogy to check for correct spelling, or they can use a dictionary for this purpose.

Table 6. Spelling skills by grade level

Spelling Skill	Explanation	Example Lesson	Grade Range
Phonological awareness	Awareness of the sound structure of spoken words	The teacher shows students two cards with pictures representing words that illustrate target features (e.g., *hat* and *bed* to differentiate two types of vowel-consonant word-ending patterns). The teacher pronounces the words with extra emphasis on the target feature. Students sort additional cards by matching based on the target feature (e.g., *red* and *sled* with *bed*; *cat* and *bat* with *hat*).[78]	K–2
Spelling phonics	Knowledge of how to connect the sounds of spoken English with letters or groups of letters	The teacher shows students a card with a picture (e.g., a ship), pronounces the word, and describes the targeted sound (in this example, /sh/). The teacher then names the letters in the associated spelling unit (*s*, *h*) and writes them on the board. The students repeat the example by chanting along with the teacher and writing the sound or word down on paper. The teacher continues with additional words that contain the sound (e.g., *fish*, *shape*).[79]	K–3
Morphological spelling	Understanding of the meaning of the parts (e.g., prefixes and suffixes) of words.	The teacher shows students a card with three written words (e.g., *walked*, *wagged*, *wanted*) and points out that although the part (in this case, the *–ed* on the end of each word) sounds different (/t/, /d/, /ed/), in all cases the spellings signal the same thing (that the action happened in the past).	2–6

Very young children may not have the spelling skills to correctly spell words. However, teachers can encourage children to write by allowing them to use invented spelling while they learn spelling skills. When using invented spelling, students attempt to spell a word using their existing knowledge about letter sounds and patterns. Invented spelling should become less prevalent as students gain more complex spelling skills and are able to

correctly spell more words. Teachers can use a process such as the following:

- Beginning in kindergarten, encourage students to invent spellings for words they do not know, or to spell a word phonetically (e.g., *wuz* for *was*).

- By 2nd grade, students should be reviewing the spelling they generated to see if

it looks correct (i.e., whether it follows the spelling patterns of words the student knows). If not, students should try a different spelling and determine how the second spelling looks.

- As students move into the 3rd and 4th grades, encourage them to consider how many syllables are in a word before generating and checking a plausible spelling.

Students also should learn to spell words by analogy as they draft.[80] This involves using the spelling of a known word to generate a plausible spelling for an unknown word (e.g., "If I can spell *lamp*, I can figure out how to spell *stamp*."). Like invented spelling, spelling by analogy can prevent disruptions during drafting by allowing students to focus on the writing process. Starting in 2nd grade and continuing through 6th grade, teachers should demonstrate how to spell words by analogy, and students should use the strategy when writing.[81]

As part of the editing process, students should learn how to use a dictionary. Starting in 2nd grade, students should begin using a dictionary to determine the spelling of the

A Reminder:
Connect Spelling and Writing

Starting in 2nd grade, teachers should help students develop proofreading strategies to check their spelling. Teachers should begin with basic skills such as reading aloud, which forces the student to focus on each word and draws attention to errors. Teachers then can move on to more targeted skills throughout the year, such as tailoring proofreading for specific problems. Students should be encouraged to identify areas in which they often make mistakes (e.g., possessives, *–ant* versus *–ent*, and so on) and develop proofreading skills designed to target those mistakes.

first few letters in a word, find the word in an alphabetical listing, and recognize the word once the search is narrowed. For younger students, teachers could provide students with a personal dictionary that contains an alphabetical listing of the correct spelling of words the student has previously misspelled. Students also can add words from their writing to their personal dictionary.

3. Teach students to construct sentences for fluency, meaning, and style.

Students should learn to write strong sentences that convey their intended meaning and engage readers. Teachers should focus sentence-level instruction on sentence construction, encouraging students to consider the meaning and syntax of the sentences they develop.[82] Teachers also should explicitly demonstrate how sentence construction and sentence mechanics, such as punctuation and capitalization, interact to form strong sentences.

Beginning in kindergarten, students should develop an understanding of what sentences are and should learn the basic principles of capitalization and punctuation. Teachers can use students' oral language skills to support written language skills. As students convey their ideas orally, the teacher can put those ideas in writing while explaining sentences

and demonstrating how to write them.[83] In 1st and 2nd grades, the teacher can model how to identify run-on ideas and break them into shorter sentences. Students then can independently practice writing their ideas in complete sentences, using invented spelling if necessary. Once students understand the concept of a sentence, they then need instruction in how to apply standard conventions for sentence writing, including punctuation and capitalization. Teachers should explicitly teach the conventions of written English, embedding instruction as much as possible in students' own compositions.[84]

Students also need instruction on how to use a variety of sentence structures in their writing.[85] Sentence instruction moves students from writing with a series of simple sentences

to including more complex and interesting sentences in their compositions (i.e., compound, complex, and compound-complex sentences). Sentence instruction, therefore, should include teaching students a variety of sentence types and demonstrating how to use them.[86] The instructional activities described in Table 7 can be used to develop students' sentence-construction skills. Each activity can be used for any sentence structure type, depending on the grade and skills of the students. Teachers can create sentence-construction exercises from books in the classroom, activities in the lives of students, school events, newspaper or magazine articles, or students' own writing.[87]

Table 7. Activities for sentence-structure development

Activity	Description	Examples	How the Teacher Can Implement the Activity
Sentence framing	Teachers provide sentence frames to guide students' sentence writing. Frames can range from simple to complex.	I like _____ . I like to _____ and _____ . My _____ is _____ . When I _____ , I like to _____ . She didn't go to _____ because _____ .	1. Develop a sentence frame for students to use. 2. Model the use of the sentence frame. 3. Have students use the sentence frame to construct their own sentences. 4. Have students share their sentences with peers and discuss their word choices. 5. Slowly fade the use of the sentence frame during instruction until students can write sentences independently.
Sentence expanding[88]	The teacher provides a short sentence. Students expand the sentence using different parts of speech.	The dog napped. ⬇ The brown dog napped. ⬇ The brown dog napped on the couch. ⬇ The lazy, brown dog napped on the couch. ⬇ The lazy, brown dog napped on the couch while I read a book.	1. Introduce a short sentence. 2. Model how to add to the sentence using different parts of speech, and demonstrate appropriate capitalization and punctuation as the sentence is expanded. 3. Have students provide suggestions for different parts of speech (e.g., subjects and predicates) to add to the short sentences. 4. Have students work independently or in pairs to expand a sentence. 5. Encourage students to share their expanded sentences in small groups, providing feedback to their peers.
Sentence combining[89]	Students combine two or more sentences into one simple, compound, complex, or compound-complex sentence.	My dog is brown. My dog is big. ⬇ My brown dog is big. The boy was riding his bike. The boy was careless. The boy ran into a tree. ⬇ The boy was careless while riding his bike, so he ran into a tree.	1. Choose sentences for combining. 2. Model how to combine the sentences using several examples; with older students, introduce moving, deleting, and adding words or parts. 3. Have students rate the quality of the new sentence, provide alternatives to the new sentence, and discuss which sentences sound better and why. 4. Encourage students to work in pairs to combine sentences, creating several new possibilities and rating the quality of their new sentences.

As students practice sentence construction, teachers and students should evaluate sentences based on meaning, style, and grammatical correctness.[90] Evaluation criteria could include clarity (Does this make sense? Is it easy to read?) and intended audience (Is it appropriate for the audience?).[91] If the answer is "no" to any of the questions, teachers can demonstrate how to revise the sentence. This could include identifying missing parts, incorrect punctuation, wordiness, or words that are too simple or complex for the intended audience.

Teachers should model how to use sentence-construction skills during drafting and revising.[92] During the revision process, students should be encouraged to revise their original sentences for clarity and meaning. Revising helps students apply their skills in authentic settings, as opposed to editing language on a generic worksheet. As students revise their drafts, they can use their newly learned sentence-construction skills to improve their compositions. Older students also can review or edit one another's work.[93]

4. Teach students to type fluently and to use a word processor to compose.

Students should learn how to type fluently, preferably without looking at the keyboard.[94] Typing-instruction software is one way to teach students to use correct fingering and monitor their speed and accuracy. Teachers should monitor students' use of typing software to encourage the use of correct fingering. As with handwriting instruction, typing lessons should occur regularly but be short and focused.

Students should be introduced to typing in 1st grade. By 2nd grade, students should begin regular typing practice. By the end of 2nd or 3rd grade, students should be able to type as fast as they can write by hand.

Instruction in typing should be accompanied by instruction in how to use a word processor.[96] Teachers should guide students through the basic skills involved in using a word processor, such as launching the program; opening and saving files; and adding, moving, and deleting text. Instruction should include guidance about how word-processing programs are part of the writing process (see Recommendation 2a). For example, teachers can demonstrate that editing features of word-processing programs, such as spelling and grammar checkers, can be "turned off" during the brainstorming and drafting phase so that students are not distracted by basic writing skills; instead, they can focus on conveying their ideas. Students can begin learning to use a word processor in 1st grade.

> **National Assessment of Educational Progress (NAEP)**
>
> The 2013 administration of the NAEP will require 4th-grade students to complete the writing assessment using a computer. Therefore, students must learn to use word processing and related software in the early grades in order to adequately demonstrate their writing skills on this important national test.[95]

By the end of 2nd grade, students should be able to use a word processor to produce and revise text.

Spell checkers are helpful tools for writers at all levels, but students need to understand the limitations of the software, as well as skills to compensate for those limitations. First, teach students that spell checkers do not flag spelling errors that are real words (e.g., *sad* for *said* or *there* for *their*). Second, spell checkers do not always suggest the correct spelling. One skill to deal with this problem is to spell the word phonetically (i.e., using the "invented spelling" skill described previously), which will usually prompt the correct spelling. Finally, spell checkers will often incorrectly flag proper nouns as errors. Use these and other spell-check limitations to demonstrate to students that proofreading and editing are still necessary, even with the computer.

Potential roadblocks and solutions

Roadblock 3.1. *Students struggle to develop handwriting and spelling skills, making writing a frustrating experience.*

Suggested Approach. If a student has difficulty with handwriting or spelling, consider having the student switch to typing as the primary mode of composing. If the move to typing is part of an Individualized Educational Plan (IEP), many schools may be able to find additional resources for the technological support. Teachers will need to provide these students with extra instruction in typing and using the word processor and spell checker.

Roadblock 3.2. *Students do not consistently transfer words they have learned successfully in their spelling lessons to their written compositions.*

Suggested Approach. Misspellings may occur in initial drafts, when the writer's focus is on getting ideas on paper. Teach proofreading as part of the editing process. Additional strategies to connect spelling instruction to authentic writing activities could include the following:

- encouraging students to write sentences or short texts using as many of their spelling words as possible, then having students review their writing, circle the new spelling words, and check that they used the correct spelling

- developing a bulletin board on which students post creative examples of spelling words used correctly in context

- reviewing students' compositions to identify repeated errors and including those spelling patterns as part of spelling instruction

- having students set specific goals targeted toward identifying spelling errors during the editing process, then monitor and track progress toward spelling goals

Roadblock 3.3. *The school's writing or English language arts curriculum includes only isolated grammar instruction using worksheets or copying tasks to teach sentence-writing skills.*

Suggested Approach. Grammar instruction that relies on worksheets or copying tasks to teach sentence-writing skills can be disconnected from students' actual writing. Students may be able to correctly circle parts of speech or identify and correct errors in punctuation, but they often do not develop the ability to use these skills in their own work. One approach is to follow the grammar curriculum's scope and sequence but modify the method of teaching. For example, teachers can use the sentences in the program as models, but teach using the modeling and gradual release methods described in Recommendation 2. Most importantly, teachers should have students practice these skills while drafting, revising, and editing their own writing.

Create an engaged community of writers.

Students need both the skill and the will to develop as writers.[97] Teachers should establish a supportive environment in their classroom to foster a community of writers who are motivated to write well. In a supportive writing environment, teachers participate as writers, not simply instructors, to demonstrate the importance of writing. By taking part in writing lessons and activities, teachers convey the message that writing is important, valued, and rewarding.

To further develop students' motivation to write, teachers should include opportunities for students to choose their own topics and/or modify teacher-selected prompts related to the purposes and genres being taught. When students choose their own topics, they may become more engaged and motivated to write. Such engagement and motivation could potentially lead students to write more frequently and become more involved in the writing process and the writing community.

Students and teachers also should have regular and structured opportunities to interact through giving and receiving feedback as well as collaborating on writing activities. Collaboration can increase the sense of community in a classroom, as well as encourage students to become engaged in the writing process with their peers. When students feel connected to one another and to the teacher, they may feel safe participating in the writing process and sharing their writing with peers. Publishing students' work also can help them feel valued in their community.

Summary of evidence: Minimal Evidence

The level of evidence for this recommendation is based on five studies that examined interventions related to creating an engaged community of writers.[98] The panel cautions that the studies varied with respect to how closely they were aligned to the recommendation. While all the studies examined practices that are related to the recommendation, some were only partially aligned to the recommendation (they examined interventions that contain fewer than 30 percent of the components of the recommendation). In addition, many of the studies examined the effectiveness of practices designed to engage students when combined with other practices that were not related to this recommendation—for example, instruction in the structure and elements of stories and persuasive essays (Recommendation 2). In these cases, it was impossible to assess whether the effects resulted from the engaging practices or from other practices included in the intervention. Furthermore, though the majority of practices led to positive effects on the quality of students' writing, one of the studies produced mixed effects on overall writing quality.[99] The panel believes, however, that the practices described in this recommendation are an integral component of effective writing instruction.

The practices tested in the studies included teachers writing with their class,[100] students choosing their topic,[101] peers brainstorming or editing together or writing interactively,[102] teachers or peers providing structured feedback on writing,[103] and publication of student writing.[104] Researchers conducted the studies in classrooms for students in grades 3–6, and two of the studies took place in countries other than the United States.[105] Four studies found positive effects on writing quality and writing output;[106] however, one study found negative effects as well as positive effects,[107] and one study found no evidence of an effect.[108]

The panel describes the five components of this recommendation below.

How to carry out the recommendation

1. Teachers should participate as members of the community by writing and sharing their writing.

Teachers should model how the ability to write affects their daily lives, demonstrate the importance of writing to communicate, model the perseverance required to create a good piece of writing, and express the satisfaction that can come from creating a meaningful text.[109] For example, a teacher could draft a letter or an email to a friend in front of students, thinking out loud to make the invisible act of composing—which occurs internally for experienced writers—more visible to students. A teacher also could collaborate with all students on a writing project, such as composing a how-to guide for carving a Halloween pumpkin or writing a class newsletter. Teachers also should take part in writing assignments. For instance, if students are asked to describe a favorite family tradition, the teacher could offer his or her own example, actively conveying how selecting a topic one is interested in can generate excitement about writing.

2. Give students writing choices.

Teachers should provide opportunities for student choice in writing assignments—for example, choice in selecting writing topics or the freedom to modify a teacher-selected prompt.[110] One way to foster choice is for students to keep a notebook in which they record topics for writing, such as memories, pets, vacations, "firsts" (e.g., first time riding

a bike, first soccer goal, first day at camp), and favorite holidays.[111] Students should add topics often and consult their notebooks throughout the school year. Teachers also can encourage students to write for themselves; their peers; an imaginary audience (e.g., a character in a story); adults (e.g., their parents or an author); or a wider, unknown audience.

Teachers need to provide instruction and opportunities for students to practice writing to prompts. A prompt should inspire students to write while ensuring that students practice writing skills aligned with the teacher's instructional purpose (e.g., a specific genre or a specific purpose). The prompt should clearly state expectations with regard to content and writing skills, while still giving students room to express themselves. For example, students might be prompted to write about a historical figure or a character from a story (see Example 4). Prompts enable teachers to emphasize specific content standards as well as promote engagement and community-building.

Example 4. The Westward Movement prompt

For grades 5 and 6

Choose a group of people who interested you during our study of the Westward Movement. These people might be settlers, pioneers, or explorers. Consider the challenges these people faced in moving West.

Write a multi-paragraph paper that describes two or three difficulties or problems encountered by these people. Describe how they solved, or attempted to solve, these problems and whether or not their solutions worked. You are writing an explanation, not telling a story. Your paper will be used as the opening article in our class book on the Westward Movement and will be followed by first-hand accounts from settlers and explorers.

In your explanatory paper:

- write in the third person (the "they" point of view)
- identify and explain their challenges/problems
- describe how they solved or tried to solve their problems
- explain whether or not their solutions worked
- choose vocabulary words that clearly illustrate the problems and solutions
- use correct spelling, punctuation, and grammar

Adapted for early elementary use (grades 2 and 3)

Choose a character from a story you read or a story read to you. Describe a problem that this character had. Describe how this character solved, or tried to solve, this problem. Explain whether the solution worked.

Examples of a character and a problem to be solved:

- Ramona Quimby having to give a speech
- little pig protecting himself from the hungry wolf

3. Encourage students to collaborate as writers.

Teachers can encourage students to collaborate throughout the writing process by brainstorming ideas about a topic, responding to drafts in a writing group, or helping peers edit or revise their work.[112] Collaboration also can take the form of collaborative writing, whereby students jointly develop a single text. Younger students, for example, can take turns sharing the pen as they create a message on chart paper. Older students can collaborate by publishing a class newspaper or composing stories to share with their friends or classmates. One collaborative activity that helps build a community of writers is "Star of the Day" (see Example 5).

Example 5. "Star of the Day"

In the "Star of the Day" activity, each student is celebrated on his or her own day. Seated at the front of the classroom, the Star of the Day answers interview questions from peers using a pretend microphone. After the interview, students compose one sentence about the Star of the Day. These sentences are shared and combined into a class paragraph, which is then displayed on the class bulletin board, as demonstrated by this example from a 1st-grade classroom:

Jordan is the Star of the Day. He likes the color blue. He loves to eat ice cream. His favorite animal is a tiger. Jordan lives in Irvine. It's his birthday today![113]

STAR of the DAY!
Jordan

4. Provide students with opportunities to give and receive feedback throughout the writing process.

Students need to know whether their writing is accurately and appropriately conveying its message. One way students can determine this is by sharing their writing and responding to written and verbal feedback from the teacher and their peers.[114] Although teachers should provide feedback to students through teacher-student conferences and rubrics, peers also should be encouraged to participate in the feedback process. Students may be able to identify problems in other people's writing more easily than they can identify issues in their own work. Additionally, when students provide written feedback and assessment to peers, their comments and observations may enhance their understanding of their own writing.

Students need to be taught strategies and appropriate language for written feedback.

Without explicit instruction in how to provide and receive feedback, students may focus solely on the conventions of writing. For example, if teachers focus only on spelling errors as they grade writing assignments, student writers will likely point to similar mistakes when providing feedback to peers. Therefore, teachers should develop rules and procedures for providing and sharing feedback on writing.[115] When teachers emphasize meaning over form and correctness in early drafts, students may learn to do the same.

Teachers also should model and provide sample language to encourage appropriate verbal feedback. During "Author's Chair," for example, teachers can encourage students to practice giving "kind comments"—constructive comments and positive statements about peers' writing (see Example 6).
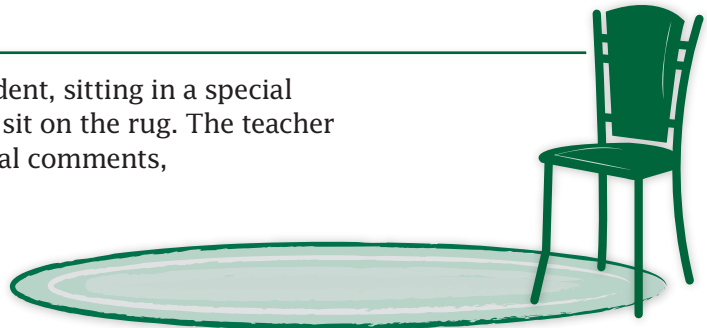
Example 6. "Author's Chair"

During the "Author's Chair" activity, one student, sitting in a special chair, reads his or her work to peers as they sit on the rug. The teacher then models and facilitates giving kind verbal comments, such as the following:

I really like _____ .

A standout line in your text for me is
_____ because _____ .

I could really picture _____ because _____ .

5. Publish students' writing, and extend the community beyond the classroom.

Students may begin to see themselves as writers if they have opportunities to publish their writing.[116] Publishing can take a variety of forms, including displaying student work prominently in the classroom. For example, teachers can create a "Wall of Fame" featuring the best excerpts from students' writing on a bulletin board in the classroom.

Teachers also can use publishing to extend the community beyond the classroom. Students can publish stories in books that include an "About the Author" page. These books can be made available in the school or classroom library. Students' work also can be displayed in the hallway or administration building, and teachers can have students participate in a "Gallery Walk." In this activity, students frame their poems or stories on

Technology Tip

With appropriate safeguards and permission, teachers can create class blogs for students to post their work online or encourage them to submit their work to online sites that publish student writing.

poster board, decorate them, and hang them around the school or classroom to simulate an art gallery. Students then circulate around the "gallery," reading one another's pieces, writing kind comments on sticky notes, and attaching the notes to the work on display. Publishing student work in this manner celebrates writing and helps create a physical environment that is conducive to learning.

Potential roadblocks and solutions

Roadblock 4.1. *Teachers may be uncomfortable with their own writing and therefore hesitant to share their writing and discuss the writing process with their students.*

Suggested Approach. Part of creating a community of writers involves establishing a supportive environment in which every member of the community has room to grow and it is acceptable to take risks and make mistakes. Writing is a lifelong skill, and it is important for students to understand that writing requires effort even when you are older and have been writing for many years. Making mistakes, demonstrating how to recognize those mistakes, and then correcting mistakes or revising word choice or sentence structure to make the writing more compelling can be a powerful model and learning experience for all members of the class.

Roadblock 4.2. *If students are allowed to choose their own topics for writing, teachers may not be able to focus on the content standards adequately.*

Suggested Approach. Teachers can expose students to the genres of writing required in the content standards and still allow students an element of choice. For example, when teaching the personal narrative, teachers can have students select a photograph of a vacation, favorite place, or important event and use their writing to dramatize what happened. When teaching persuasive writing, teachers can allow students to select an issue, or select which side of an argument to defend.

Roadblock 4.3. *Providing feedback on all student writing is overwhelming and time consuming.*

Suggested Approach. It is not necessary for the teacher to provide feedback on all student writing; teachers should share the responsibility of providing feedback with students through student self-evaluation and peer evaluations. In fact, students should be able to write without expecting that every piece of writing will be assessed by the teacher. When students do complete writing pieces for teacher review and feedback, teachers should focus on specific elements, and they should discuss these expectations with students in advance. In this way, teachers can focus their comments on specific elements, such as a compelling opening, descriptive language, or effective use of transition words. Providing targeted feedback will help students better understand how to improve their writing.

Glossary

A

Audience refers to the reader for whom a piece of writing is intended. Audience can range from the writer who produces the text (e.g., a diary entry) to peers, teachers, parents, or other trusted adults.

B

Students draw upon **basic writing skills**, such as handwriting, spelling, and sentence construction, to translate their thoughts and ideas into writing. Students also draw on typing and word-processing skills when composing electronically.

C

Collaborative writing is a process whereby students jointly develop a single text. Examples include younger students sharing a pen to draft a message on chart paper, or older students publishing a class newspaper or composing stories to share with their friends or classmates.

E

Exemplary text is a written piece used as an example of quality writing. This text is commonly a published piece of writing, but it also can be writing created by a student or teacher. The exemplary text demonstrates specific ideas and/or structure. The writer can emulate exemplary text in his or her own writing. Exemplary text is sometimes referred to as "model text" or "touchstone text."

F

Fluency is the ability to communicate ideas in writing accurately and quickly with relatively little effort. Fluency is an important factor in a writer's ability to manipulate sentence structures to produce comprehensible text. Writing fluency also requires automatic or relatively effortless handwriting, typing, and spelling skills.

G

Genre is a form of writing with specific features that provides context and structure for a particular purpose and audience. For example, the narrative genre includes personal or made-up stories and typically includes elements such as characters and plot, whereas the persuasive genre can include letters and essays that incorporate features such as an introduction, thesis statement, supporting material, and conclusions.

Genre elements, sometimes referred to as "text elements," refer to specific features typical of a particular genre. For example, the elements of a story include place, a starting event, action, and ending.

Gradual release of responsibility is an instructional model whereby a teacher teaches a strategy explicitly and then gradually decreases the level of support to the student, ultimately releasing the student to use the strategy independently.[117]

I

Ideation refers to the development and quality of ideas students include in their writing. Qualitative measures of ideation include the overall richness and number of ideas in a composition. Quantitative measures include the number of different ideas.

Invented spelling is a student's attempt to produce a plausible spelling for an unknown word. This can range from using one letter to represent an entire word (e.g., *b* for *bed*), using the first and last sounds of a word (e.g., *gl* for *girl*), or spelling a word phonetically (e.g., *wuz* for *was*).

M

Mechanics refers to assessments of handwriting, spelling, capitalization, and punctuation. The term *usage* also may be applied and typically refers to the combination of capitalization and punctuation.

O

Measures of **organization** assess the structure of a composition. This can include the connection between ideas in the text, as well as how well individual ideas are organized or connected to meet a writer's purpose (often referred to as "cohesiveness").

Measures of **overall writing quality** assess the overall effectiveness of a piece of writing. These measures may take into account assessments of intermediary outcome categories—including ideation, genre (or text) elements, mechanics, organization, output, sentence structure, vocabulary, and voice—in a single assessment of the quality of a piece of writing. Overall writing quality may be assessed either analytically or holistically. Analytic writing quality is measured using scales for which multiple attributes of writing (e.g., mechanics, vocabulary, sentence structure, organization, ideation, and voice) are each judged separately and then summed to obtain a single score. To measure holistic writing quality, the assessor makes a single judgment about overall quality, considering a variety of attributes at the same time. Although different elements of writing quality—for example, organization, ideation, or mechanics—may contribute to the overall quality of the piece, these different elements are not evaluated separately in holistic writing quality measures.

P

Purpose refers to the objective a writer is trying to achieve with a particular piece of writing. There are four general purposes for writing (describe, narrate, inform, and persuade/analyze), and each purpose has a variety of genres that can help provide context and structure for a particular purpose and audience.

R

A **rubric** is an assessment tool. Rubrics typically include a set of criteria for assessing performance on written assignments, allowing for standardized evaluation according to the specified criteria. Rubrics can be used by teachers to evaluate student work, or by students for self-evaluation and/or peer review.

S

Measures of **sentence structure** typically assess sentence correctness or sentence complexity. For example, a sentence-structure measurement might count the number of sentences in a composition that are syntactically correct.

A **strategy** is a series of actions (mental, physical, or both) that writers undertake to achieve their goals. Strategies are tools that can help students generate content and carry out components of the writing process. For example, students can use peer-sharing strategies to give and receive feedback with a writing partner.

T

A **technique** is a specific tool that students can use to generate content and frame their writing for a specific genre. Whereas a strategy can be applied to all genres, techniques are specific to a particular genre and the features that provide context and structure for the genre. For example, students can use the TREE technique (described in Recommendation 2b) to plan and draft a persuasive essay.

Text structure refers to the way in which a text is organized to convey meaning to the reader. It encompasses how the main point is conveyed (e.g., sequence of events, comparison, or cause and effect) and the vocabulary the author selects to convey meaning to the reader. In text-structure instruction, students are taught to identify common text structures and use them to organize the information they are reading or writing.

V

Vocabulary refers to the types of words used by the student in his or her writing. Vocabulary may be assessed by counting specific types of words (e.g., the number of different words or the inclusion of content-specific words), or by examining the complexity of words (e.g., number of syllables).

Voice often is referred to as "tone," "mood," or "style," and it tells the reader about the writer's personality in the composition. Voice typically is assessed by rating how well the student establishes mood, tone, style, or his or her individual personality in writing.

W

Writing is the process through which people communicate thoughts and ideas. Writing can include beginning scribbles, drawings, random letter strings, single-letter spellings, invented spelling, or complete sentences and paragraphs. Writing also can include students dictating ideas to an adult or peer for transcription. Writing can be done through paper and pencil, typing, audio recording, or speech synthesis. *Authentic writing* involves student generation of original text, including sentences, paragraphs, or longer pieces. For example, students might develop a paragraph in response to a writing prompt. Writing from dictation, correcting grammatical errors on a worksheet, and combining two sentences generated by a teacher do not qualify as authentic writing, because students are not generating the content themselves.

Measures of **writing output** refer to the actual quantity of text produced. Some examples of output measures include the number of sentences or the number of words in a composition.

The **writing process** is the approach a writer uses to compose text. Components of the writing process include planning, drafting, sharing, revising, editing, and evaluating. These components are recursive. They can occur at any point during the writing process, and students should learn to skillfully and flexibly move back and forth between the components while composing text. On occasion, an additional component, publishing, is added to the process as a final product to conclude the writing process.

Rationale for Evidence Ratings[a]

The research used in this practice guide was identified through a search for research on practices for improving students' writing. The search focused on studies published between 1989 and 2009 that examined practices for teaching writing to students in elementary school settings.[118] In addition to identifying intervention studies conducted with typically developing students, the search included studies of students with diagnosed learning disabilities or designated as English language learners. Studies examined students in both the United States and other countries. The search was supplemented with studies recommended by the panel based on its expertise in the area of writing research.

The search identified more than 1,575 studies, including 118 with designs that could be reviewed against What Works Clearinghouse (WWC) standards for randomized controlled trials (RCTs) and group quasi-experimental designs (QEDs). From this subset, 41 met the WWC evidence standards, and 34 were relevant to the panel's recommendations and were included as support or supplemental evidence for the recommendations in this practice guide. Twenty studies were eligible for review against the WWC pilot standards for well-designed single-case design (SCD) research. Of these, 13 met the pilot standards and 11 were included as supplemental evidence for the recommendations in this guide. While group design studies (RCTs and QEDs) contribute to the level of evidence rating for a recommendation, SCD studies cannot raise the level of evidence above minimal.

In this practice guide, a group design study result is classified as having a positive or negative effect when it meets either of the following criteria:

- the result is statistically significant ($p \leq 0.05$)[119]

- the result is substantively important as defined by the WWC (effect sizes greater than 0.25 or less than –0.25, regardless of statistical significance)[120]

SCD studies are classified as having a positive effect if visual analysis finds at least three demonstrations of an effect (for more information on the pilot WWC standards for single-case design or visual analysis, please see the *WWC Procedures and Standards Handbook*, available on the IES website at http://ies.ed.gov/ncee/wwc/documentsum.aspx?sid=19).

When a result meets none of these criteria, it is classified as having "no effect."

Some studies meet WWC standards (with or without reservations) for causal designs but do not adjust statistical significance for multiple comparisons or student clusters where the unit of assignment is different from the unit of analysis (e.g., classrooms are assigned to conditions, but student test scores are analyzed). When full information is available, the WWC adjusts for clustering and multiple comparisons within an outcome category.[121]

Eligible outcomes. The guide focuses on nine outcome categories. In general, the panel only considered measures of student ability based on original, student-written products (or authentic writing), because it is not clear whether students translate skills practiced on worksheets and spelling tests into improvements in authentic writing. For example, students who correctly identify grammatical errors in a worksheet may not transfer that skill to their authentic writing.[122] The panel made one exception to this rule: norm-referenced standardized tests of writing achievement. This exception was made because teachers are increasingly called upon to demonstrate improvement on these tests and are likely to be interested in interventions that have demonstrated impacts on these types of

---

[a] Eligible studies that meet WWC evidence standards or meet evidence standards with reservations are indicated by **bold text** in the endnotes and references pages.

assessments. The nine outcome categories for this practice guide follow:

- **Overall writing quality** measures the effectiveness of a piece of writing. These measures may take into account assessments of intermediary outcome categories—including ideation, genre (or text) elements, mechanics, organization, output, sentence structure, vocabulary, and voice—in a single assessment of the quality of a piece of writing. Overall writing quality may be assessed either analytically or holistically. Analytic writing quality is measured using scales for which multiple attributes of writing (e.g., mechanics, vocabulary, sentence structure, organization, ideation, and voice) are each judged separately and then summed to obtain a single score. To measure holistic writing quality, the scorer makes a single judgment about overall quality, considering a variety of attributes at the same time. Though different elements of writing quality—for example, organization, ideation, or mechanics—may contribute to the overall quality of the piece, these different elements are not evaluated separately in holistic writing quality measures.

- **Writing output** refers to the actual quantity of text produced. Some examples of output measures include the number of sentences or the number of words in a composition.

- **Genre elements**, sometimes referred to as "text elements," measure whether features typical of a particular genre are present. For example, one might assess whether elements of a story, such as characters, place, a starting event, action, and ending, are present in students' writing.

- **Ideation** assesses the development and quality of ideas students include in their writing. Qualitative measures of ideation include the overall richness and number of ideas in a composition. Quantitative measures include the number of different ideas.

- **Mechanics** refers to assessments of handwriting, spelling, capitalization, and punctuation. The term *usage* also may be applied and typically refers to the combination of capitalization and punctuation.

- **Organization** assesses the structure of a composition. This can include the connection between ideas in the text, as well as how well individual ideas are organized or connected to meet a writer's purpose (often referred to as "cohesiveness").

- **Sentence structure** typically assesses sentence correctness or sentence complexity. For example, a sentence structure measurement might count the number of sentences in a composition that are syntactically correct.

- **Vocabulary** refers to the types of words used by the student in his or her writing. Vocabulary may be assessed by counting specific types of words (e.g., the number of different words or the inclusion of content-specific words), or by examining the complexity of words (e.g., number of syllables).

- **Voice** is often referred to as "tone," "mood," or "style," and it tells the reader about the writer's personality in the composition. Voice is typically assessed by rating how well the student establishes mood, tone, style, or his or her individual personality in writing.

The panel was most interested in interventions that demonstrate improvements in overall writing quality, since teaching students to write effectively is the ultimate objective of writing instruction. However, particularly because this guide focuses on students in the early stages of writing development, the panel believes that improvements on intermediary outcome categories—including writing output, mechanics, vocabulary, sentence structure, organization, ideation, voice, and genre elements—are relevant and important. As a result, the panel accepted outcomes in any of these categories.

Finally, given the subjective nature of many writing assessments, the panel felt strongly that minimum thresholds of inter-rater reliability must be documented on the study sample for subjective writing assessments included as evidence of a practice's effectiveness. One common measure of inter-rater reliability is Pearson correlation, for which a minimum correlation of 0.70 was required; however, the panel accepted a variety of different measures of inter-rater reliability, and the minimum thresholds varied across these measures. Norm-referenced standardized tests were exempted from this requirement.

To facilitate comparisons, the panel focused on the outcome closest to the end of the intervention; these are labeled *posttests*. All outcome measures administered after the posttest are labeled *maintenance* in appendix tables. Measures the panel believes require students to apply knowledge or skills in a new context are labeled *transfer outcomes* in appendix tables. When studies have multiple posttest outcome measures administered within the same category, effect sizes for each measure are averaged, and the overall average is reported.

Multicomponent interventions. Many of the studies that contributed to the evidence ratings for this guide examined the effectiveness of several instructional practices tested together. For example, one study tested the effectiveness of an after-school writing club for struggling writers. The intervention included instruction in a process approach to writing (Recommendation 2), but it also included providing extra time for writing instruction (Recommendation 1). In these cases, it was not possible for the panel to determine which of the practices included in the intervention caused any observed effects on writing outcomes; however, they provided evidence of the effectiveness of the practice of interest, when implemented with the other practices in the multicomponent intervention.

Classifying the comparison condition. The studies cited as evidence for this guide compared the writing of students who were

exposed to a particular intervention (treatment condition) to the writing of students who were not exposed to the intervention of interest (comparison condition). The panel refers to the comparison condition in studies for which the interventions were provided as a supplement to students' typical classroom instruction or as a replacement for some portion of students' typical classroom instruction as "regular classroom instruction." In other cases, students exposed to the intervention were compared to students receiving a different, well-defined intervention, which the panel refers to as a "treated comparison."

Writers who are at risk. While the recommendations in this guide are primarily intended for teachers to use with typically developing students, some of the studies used to support the recommendation were conducted on populations of students at greater risk of experiencing difficulty learning to write, including students with identified learning disabilities; students with low baseline scores on assessments of handwriting, spelling, or writing ability; or students struggling with behavior. In the appendices, "at risk" refers to cases in which more than 50 percent of the sample in a study met one of these criteria. In some cases, exactly 50 percent of the student population was at risk for writing difficulties, in which case the sample is referred to as "half at risk."

Recommendation 1. Provide daily time for students to write.

Level of evidence: Minimal Evidence

The panel judged the level of evidence for this recommendation to be *minimal evidence*. While a considerable amount of time is required to implement the practices in this guide, no studies that met WWC evidence standards explicitly examined whether providing students with daily opportunities to write leads to better writing outcomes than providing less frequent writing opportunities. Nonetheless, in light of recent surveys of elementary

teachers indicating that students spend very little time writing during the school day,[123] the panel believes it is important to acknowledge the time required to implement the practices in this guide by making daily writing instruction and practice its own recommendation. The panel cautions that time for writing is necessary, but not sufficient on its own; additional time for writing will improve students' writing achievement only when aligned with the recommendations in this guide.

Limited support for this recommendation comes from one study of additional writing instruction and time for writing practice that meets WWC evidence standards for group designs.[124] Table D.1 summarizes the characteristics of the study that contributes to the level of evidence rating for this recommendation. In the study, students who were at risk for writing difficulties attended a before- or after-school "writing club," which involved additional time for writing instruction and practice twice a week for an hour over seven months, in addition to their regular instruction in writing.[125] The study found that students assigned to the writing clubs demonstrated improvement on

a standardized measure of sentence structure relative to comparison group members who did not attend the writing clubs. The additional instructional time included instruction in genre-specific writing strategies aligned with the practices described in Recommendation 2b.

Supplemental evidence comes from two studies, both SCDs, in which the total additional time for writing instruction was more limited and was delivered over a shorter period of time.[126] Both studies examined the effectiveness of additional instructional time, provided as a supplement to students' regular classroom instruction, using self-regulated strategy development (SRSD, described in greater detail in the description of the evidence supporting Recommendation 2). The characteristics of supplemental studies are included in Table D.2. Both studies led to positive effects on the number of elements students included in their writing (persuasive or story). Though the interventions were short in duration, the panel believes that sustained additional instructional time could lead to continued improvements in and maintenance of the promising results.

Table D.1. Studies that contribute to the level of evidence for Recommendation 1

Study Details			
Study Citation and Design[127]	**Analytic Sample Size**[128] **and Population**	**Treatment**	**Outcome, Effect Size**[130]
Berninger et al. (2006) Study 4 *RCT*	90 students in 4th grade who were at risk	**Intervention Group (Dosage)**[129] after-school writing clubs whole class in addition to regular instruction (64 sessions, 60 minutes each)	**sentence structure, 0.63 (ns)**
		Comparison Group[131] regular classroom instruction	

Table D.2. Supplemental evidence supporting the effectiveness of Recommendation 1

Study Details			
Study Citation and Design[132]	**Analytic Sample Size**[133] **and Population**	**Treatment**	**Outcome, Effect Size**[135]
Mason and Shriner (2008) *SCD*	6 students in 2nd through 5th grade who were at risk	**Intervention Group (Dosage)**[134] SRSD instruction with minor modifications for students with behavioral challenges in addition to regular instruction individual (11–13 sessions, 30 minutes each) **Comparison Group**[136] regular classroom instruction	<u>Persuasive:</u> **genre elements, positive effects**

All of the studies cited as evidence of the effectiveness of the practices recommended in this guide noted the provision of time for quality writing instruction, writing practice, or both. The time required to implement the interventions varied (see Tables D.3, D.4, D.5, D.6, D.7, and D.8, which summarize the evidence for Recommendations 2, 3, and 4). Dedicated writing time is needed in order to implement the recommendations in this guide, and the panel believes this should be at least 30 minutes per day for students in kindergarten and at least an hour per day for all other students in elementary school.

Recommendation 2. Teach students to use the writing process for a variety of purposes.

The individual how-to steps are separated into two sections because writing is a complex process and the steps needed to carry out this recommendation are numerous. Recommendation 2a discusses teaching students how to apply the writing process, while Recommendation 2b addresses teaching students to write for a variety of purposes. Because research has examined all of these steps in combination, we describe the evidence supporting all of Recommendation 2 below.

Level of evidence: Strong Evidence

The panel judged the level of evidence for Recommendation 2a and Recommendation 2b, when implemented together, as *strong evidence.* Altogether, 25 studies that meet WWC evidence standards provide causal support for this multipart recommendation.[137] The interventions tested in the studies were closely related to those recommended by the panel, including eight studies that tested an intervention containing at least six of the eight practices in Recommendation 2.[138] The studies found predominantly positive effects on a range of outcomes; 18 studies found positive effects on overall writing quality.[139] One study reported mixed effects in the overall writing quality domain, including a substantively important negative effect at posttest.[140] The panel cautions against drawing strong conclusions from this study because the study itself tested only a minor modification to a comprehensive set of practices recommended by the panel. Both the treatment and comparison groups received most of the practices recommended by the panel, and both the treatment and comparison groups improved at posttest. Overall, this study demonstrates mixed effects for only one practice, explicit self-regulation strategies. The studies were conducted in settings and among populations that mirror the variety of settings and populations for which

this guide is intended, including a wide range of achievement levels, grades, and regional settings. The panel is confident that when implemented together, the practices described in Recommendation 2a and Recommendation 2b can be effective in improving a variety of student writing outcomes, including the overall quality of students' writing. Supplemental evidence comes from nine SCD studies.[141]

Studies testing the effectiveness of instruction in strategies

As a result of the large number of studies that provide support for this recommendation, the panel grouped the studies into four categories for discussion:

- The first broad category of studies tested the effectiveness of self-regulated strategy development (SRSD), an intervention that typically includes more than 70 percent of the components of the panel's recommendation, and minor modifications to this intervention.[142]

- The studies in the second category examined the effectiveness of interventions focused strictly on various types of goal setting, a component of the panel's recommendation that has demonstrated considerable promise for improving students' writing. Typically, goal-setting interventions contain fewer than 30 percent of the components of Recommendation 2.

- The third category consists of studies that fall in neither of the first two categories but examine interventions that are moderately or closely aligned with the recommendation. Studies that are moderately aligned are those that contain at least 30 percent, but fewer than 80 percent, of the components of the panel's recommendation; studies that are closely aligned are those that contain at least 80 percent of the components of the panel's recommendation.[143]

- Similarly, the final category contains studies that are not of SRSD or goal setting and are only partially aligned with the panel's recommendation (containing fewer than 30 percent components of the panel's recommendation).

All of the studies examined interventions that contained one or more practices described in Recommendation 2.

For each group of studies, this section first describes the general nature of the intervention and then provides an example or two of the studies that tested it, focusing on those that tested the intervention among a population of typically achieving students in a whole-class instructional setting. Next, this section summarizes the effectiveness of all the studies in that category, focusing primarily on measures of overall writing quality. When appropriate, this section discusses how the effectiveness of the intervention varied when administered to a population that was at risk or when delivered outside of a whole-class setting. Finally, this section describes how minor variations in the intervention impacted its effectiveness.

The panel believes it is important to implement the practices in Recommendations 2a and 2b in combination but notes that the studies varied in terms of how closely the intervention studied aligns to the panel's recommendation. Table D.3 summarizes the characteristics of the studies that contribute to the level of evidence rating for this recommendation and the components that are included in the intervention(s) tested within each study.

The characteristics of supplemental studies are included in Table D.4. These studies were rated using the WWC pilot standards for well-designed SCD research. SCD studies alone cannot raise the level of evidence above minimal; however, they do provide supplemental support for this recommendation, which is rated as strong evidence based on the group design studies that appear in Table D.3. The panel used the descriptions of the interventions in the studies to identify the components of the recommendations included in each intervention, relying on its expert knowledge of the interventions and the research to supplement the descriptions when appropriate.

Table D.3. Studies that contribute to the level of evidence for Recommendation 2

Studies testing the effectiveness of self-regulated strategy development (SRSD) on typically achieving students

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Tracy, Reid, and Graham (2009) *RCT*	Whole class	120 students in 3rd grade	**Intervention Group (Dosage)[146]:** SRSD instruction whole class (time unknown) **Comparison Group[149]:** regular classroom instruction	Story posttest: **overall writing quality, 0.35 (ns) genre elements, 0.70 (ns) output, 0.54 (ns)** Transfer effects, narrative posttest: **overall writing quality, 0.52 (ns) genre elements, 0.72 (ns) output, 0.52 (ns)**	X	X	X		X	X	X	X
Glaser and Brunstein (2007) *RCT*	Small group or paired	69 to 72 students in 4th grade in Germany[150]	**Intervention Group (Dosage)[146]:** SRSD instruction (full model)[151] small groups (4 sessions, 90 minutes each) **Comparison Group[149]:** regular classroom instruction	Posttest: **overall writing quality, 1.20 (ns) genre elements, 2.14*** Maintenance effects (5 weeks): **overall writing quality, 1.62* genre elements, 2.35***	X	X	X		X	X	X	X
Glaser and Brunstein (2007) *RCT*	Small group or paired	69 to 72 students in 4th grade in Germany[152]	**Intervention Group (Dosage)[146]:** SRSD instruction (full model) small groups (4 sessions, 90 minutes each) **Comparison Group[149]:** SRSD instruction without self-regulation components	Posttest: **overall writing quality, 0.86 (ns) genre elements, 1.49*** Maintenance effects (5 weeks): **overall writing quality, 1.07 (ns) genre elements, 2.28***	X							

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Studies testing the effectiveness of SRSD on students who were at risk

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Curry (1997) *QED*	Whole class	30 students in 4th grade who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction in an inclusive setting[154] whole class (32 sessions; 45 minutes each) **Comparison Group[149]:** Writer's Workshop in an inclusive setting	**overall writing quality, 0.87 (ns)**	X	X			X	X	X	X
Garcia-Sanchez and Fidalgo-Redondo (2006) *RCT*	Small-group, paired, or individual	80 students in 5th and 6th grade in Spain who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction[155] small groups (25 sessions, 45–55 minutes each) **Comparison Group[149]:** regular classroom instruction	**output, 2.49 (unknown)[156]**	X	X	X		X	X	X	

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Graham, Harris, and Mason (2005) *RCT*	Small-group, paired, or individual	24 pairs of students in 3rd grade who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction plus peer support[157] pairs (60 sessions, 20 minutes each) **Comparison Group[149]:** regular classroom instruction	Story posttest: **overall writing quality, 1.74*** **genre elements, 2.04*** **output, 1.78*** Persuasive posttest: **overall writing quality, 1.75*** **genre elements, 0.89 (ns)** **output, 1.02 (ns)** Transfer effects, narrative posttest: overall writing quality, −0.20 (ns) **genre elements, 1.38*** output, 0.19 (ns) Transfer effects, informative posttest: **overall writing quality, 0.82 (ns)** **output, 0.97 (ns)** Maintenance effects (10 weeks), story: **overall writing quality, 1.09*** **genre elements, 1.42*** **output, 0.54 (ns)**	X	X	X		X	X	X	X

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	**Setting**	**Analytic Sample Size[145] and Population**	**Treatment**	**Outcome, Effect Size[147]**	**Strategies**	**Gradual Release**	**Select and Use Strategies**	**Flexible Use**	**Purpose**	**Audience[148]**	**Exemplary Texts**	**Genre Techniques**
Graham, Harris, and Mason (2005) *RCT*	Small-group, paired, or individual	24 pairs of students in 3rd grade who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction plus peer support pairs (60 sessions, 20 minutes each) **Comparison Group[149]:** SRSD instruction only	Story posttest: overall writing quality, 0.22 (ns) **genre elements, 0.69 (ns) output, 0.39 (ns)** Persuasive posttest: **overall writing quality, −0.57 (ns) genre elements, −1.17* output, −0.82 (ns)** Transfer effects, narrative posttest: **overall writing quality, 0.42 (ns) genre elements, 0.86 (ns) output, 0.46 (ns)** Transfer effects, informative posttest: **overall writing quality, 0.38 (ns)** output, 0.24 (ns) Maintenance effects (10 weeks), story: overall writing quality, −0.22 (ns) genre elements, −0.08 (ns) output, −0.14 (ns)			X					

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	**Setting**	**Analytic Sample Size**[145] **and Population**	**Treatment**	**Outcome, Effect Size**[147]	**Strategies**	**Gradual Release**	**Select and Use Strategies**	**Flexible Use**	**Purpose**	**Audience**[148]	**Exemplary Texts**	**Genre Techniques**
Harris, Graham, and Mason (2006) *RCT*	Small-group, paired, or individual	22 pairs of students in 2nd grade who were at risk	**Intervention Group (Dosage)**[146]**:** SRSD instruction plus peer support[158] pairs (27–33 sessions, 20 minutes each) **Comparison Group**[149]**:** regular classroom instruction	Story posttest: **overall writing quality, 0.91 (ns) output, 1.01 (ns) genre elements, 4.94*** Persuasive posttest: **overall writing quality, 1.58* to 2.77* genre elements, 1.14* to 2.83* output, 0.50 (ns) to 1.56*** Transfer effects, narrative posttest: overall writing quality, 0.20 (ns) **genre elements, 2.19* output, 0.51 (ns)** Transfer effects, informative posttest: **overall writing quality, 1.22* output, 1.92*** Maintenance effects (6 months), story: **overall writing quality, 1.21* genre elements, 1.96* output, 1.22***	X	X	X		X	X	X	X

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	**Setting**	**Analytic Sample Size**[145] **and Population**	**Treatment**	**Outcome, Effect Size**[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Harris, Graham, and Mason (2006) *RCT*	Small-group, paired, or individual	22 pairs of students in 2nd grade who were at risk	**Intervention Group (Dosage)**[146]**:** SRSD instruction plus peer support pairs (27–33 sessions, 20 minutes each) **Comparison Group**[149]**:** SRSD instruction only	Story posttest: overall writing quality, 0.14 (ns) **genre elements, 0.46 (ns)** **output, 0.36 (ns)** Persuasive posttest: **overall writing quality, 0.38 (ns) to 0.44 (ns)** **genre elements, 0.63 (ns) to 0.87 (ns)** output, −0.19 (ns) to −0.06 (ns) Transfer effects, narrative posttest: overall writing quality, −0.11 (ns) **genre elements, 0.89 (ns)** output, −0.12 (ns) Transfer effects, informative posttest: **overall writing quality, 0.64 (ns)** output, 0.05 (ns) Maintenance effects (6 months), story: **overall writing quality, 0.40 (ns)** genre elements, 0.23 (ns) output, 0.21 (ns)			X					

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Sawyer, Graham, and Harris (1992) *RCT*	Small-group, paired, or individual	8 groups of students in 5th and 6th grade who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction (full model)[159] small groups (average of 8 sessions, averaging 40 minutes each) **Comparison Group[149]:** direct instruction in strategies	Posttest:[160] overall writing quality, 0.00 (ns) to **0.63 (ns) genre elements, 0.84 (ns) to 1.37 (ns)** Maintenance effects (2 weeks): **overall writing quality, 0.46 (ns) genre elements, –0.40 (ns)** Maintenance effects (4 weeks): **overall writing quality, –0.34 (ns)** genre elements, –0.22 (ns)	X	X [161]	X		X	X	X	X
Sawyer, Graham, and Harris (1992) *RCT*	Small-group, paired, or individual	8 groups of students in 5th and 6th grade who were at risk	**Intervention Group (Dosage)[146]:** SRSD instruction (full model) small groups (average of 8 sessions, averaging 40 minutes each) **Comparison Group[149]:** SRSD instruction (partial model) without self-regulation component	Posttest: **overall writing quality, –0.35 (ns)** to 0.18 (ns) genre elements, –0.01 (ns) to **0.54 (ns)** Maintenance effects (2 weeks): overall writing quality, 0.17 (ns) **genre elements, –0.71 (ns)** Maintenance effects (4 weeks): **overall writing quality, –0.81 (ns) genre elements, –0.28 (ns)**	X [162]							

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Studies testing the effectiveness of goal-setting interventions on typically achieving students.

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Ferretti, Lewis, and Andrews-Weckerly (2009) *RCT*	Small-group or individual	24 students in 4th grade and 24 students in 6th grade[163]	**Intervention Group (Dosage)[146]:** writing in response to a prompt with specific goals related to the characteristics of good persuasive writing individual (1 session, 45 minutes) **Comparison Group[149]:** writing in response to a prompt without specific goals	4th grade:[164] **overall writing quality, 0.88*** genre elements (average), 0.10 (ns)[165] 6th grade:[166] **overall writing quality, 1.11* genre elements (average), 0.41 (ns)**[167]						X		X
Schunk and Swartz (1993)[168] Study 1 *RCT*	Small-group or individual	30 students in 5th grade	**Intervention Group (Dosage)[146]:** product goals to supplement instruction in a general planning strategy small groups (20 sessions, 45 minutes each) **Comparison Group[149]:** general goal to supplement instruction in a general planning strategy	Posttest: **overall writing quality, 1.49*** sentence structure, −0.21 (ns)	X							

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Schunk and Swartz (1993) Study 1 *RCT*	Small-group or individual	30 students in 5th grade	**Intervention Group (Dosage)[146]:** process goals to supplement instruction in a general planning strategy small groups (20 sessions, 45 minutes each) **Comparison Group[149]:** general goal to supplement instruction in a general planning strategy	Posttest:[169] **overall writing quality, 2.48*** sentence structure, 0.00 (ns)	X							
Schunk and Swartz (1993) Study 2 *RCT*	Small-group or individual	20 students in 4th grade	**Intervention Group (Dosage)[146]:** product goals to supplement instruction in a general planning strategy small groups (20 sessions, 45 minutes each) **Comparison Group[149]:** general goal to supplement instruction in a general planning strategy	Posttest: **overall writing quality, 1.08*** **sentence structure, 0.56 (ns)** Maintenance effects (6 weeks):[170] **overall writing quality, 1.19 (ns)** sentence structure, 0.16 (ns)	X							
Schunk and Swartz (1993) Study 2 *RCT*	Small-group or individual	20 students in 4th grade	**Intervention Group (Dosage)[146]:** process goals to supplement instruction in a general planning strategy small groups (20 sessions, 45 minutes each) **Comparison Group[149]:** general goal to supplement instruction in a general planning strategy	Posttest:[171] **overall writing quality, 2.62*** **sentence structure, 2.72*** Maintenance (6 weeks):[172] **overall writing quality, 1.74*** **sentence structure, 2.47***	X							

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Studies testing the effectiveness of goal-setting interventions on students who were at risk

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Ferretti, MacArthur, and Dowdy (2000) *RCT*	Whole class	57 students in 4th grade and 61 students in 6th grade, half of whom were at risk[173]	**Intervention Group (Dosage)[146]:** writing in response to a prompt with specific goals related to the characteristics of good persuasive writing whole class (2 sessions, 45 minutes each) **Comparison Group[149]:** writing in response to a prompt without specific goals	4th grade:[174] overall writing quality, 0.05 (ns) to 0.12 (ns) 6th grade:[175] **overall writing quality, 0.62* to 0.73***								X
Midgette, Haria, and MacArthur (2008) *RCT*	Whole class	49 students in 5th grade who were at risk	**Intervention Group (Dosage)[146]:** content goals for revising[176] whole class (2 sessions; minutes unknown) **Comparison Group[149]:** general goals for revising	**overall writing quality, 0.50 (ns)** genre elements (average), −0.05 (ns)								X
Midgette, Haria, and MacArthur (2008) *RCT*	Whole class	49 students in 5th grade who were at risk	**Intervention Group (Dosage)[146]:** audience goals for revising whole class (2 sessions; minutes unknown) **Comparison Group[149]:** general goals for revising	**overall writing quality, 0.54 (ns) genre elements (average), 0.48 (ns)**					X	X		X

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Midgette, Haria, and MacArthur (2008) *RCT*	Whole class	49 students in 5th grade who were at risk	**Intervention Group (Dosage)[146]:** audience goals for revising whole class (2 sessions; minutes unknown) **Comparison Group[149]:** content goals for revising	**overall writing quality, 0.09 (ns) genre elements (average), 0.52 (ns)**					X	X		X [177]
Graham, MacArthur, and Schwartz (1995) *RCT*	Individual	39 students in 4th through 6th grade who were at risk	**Intervention Group (Dosage)[146]:** goal to add information[178] individual (2 sessions, no time restrictions) **Comparison Group[149]:** goal to make papers better	**overall writing quality, 0.75* output, 0.51 (ns)**	X							

Studies testing the effectivenes of moderately or closely aligned interventions on typically achieving students

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Gordon and Braun (1986) *RCT*	Whole class [Whi]	54 students in 5th grade in Canada	**Intervention Group (Dosage)[146]:** instruction in narrative text structure whole class (15 sessions, 60 minutes each) **Comparison Group[149]:** instruction in poetry structure	<u>Posttest:</u> **genre elements, 0.28 (ns)** <u>Maintenance effects (6 weeks):</u> genre elements, –0.06 (ns)		X					X	X
Guastello (2001) *RCT*	Whole class	167 students in 4th grade[179]	**Intervention Group (Dosage)[146]:** instruction and practice using rubrics to evaluate writing whole class (time unknown) **Comparison Group[149]:** regular classroom instruction	**overall writing quality, 1.27***	X				X	X		
Pritchard and Marshall (1994) *QED*	Whole class	1,284 students in 3rd through 6th grade	**Intervention Group (Dosage)[146]:** National Writing Project tiered staff-development model whole class (time unknown) **Comparison Group[149]:** regular classroom instruction	**overall writing quality, 0.39 (unknown)**[180]	X			X [181]	X	X		

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 (continued)

Studies testing the effectivenes of moderately or closely aligned interventions on students who were at risk

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
MacArthur, Schwartz, and Graham (1991) *RCT*	Whole class	29 students in 4th through 6th grade who were at risk	**Intervention Group (Dosage)[146]:** student-editor strategy within a process writing approach whole class (24–32 sessions, 30–45 minutes each) **Comparison Group[149]:** process writing approach only	**overall writing quality, 1.42*** **mechanics (average), 0.43**[182]	X	X	X	X [183]	X	X		
Riley (1997) *RCT*	Whole class	114 students in 3rd through 5th grade who were at risk	**Intervention Group (Dosage)[146]:** story grammar instruction[184] whole class (18 sessions, 20–30 minutes each) **Comparison Group[149]:** process writing approach	**output, 1.03***	X						X	X
Gambrell and Chasen, (1991) *RCT*	Small group or paired	40 students in 4th and 5th grade who were at risk	**Intervention Group (Dosage)[146]:** explicit story structure instruction small groups of 8–12 students (3 sessions; minutes unknown) **Comparison Group[149]:** story structure awareness instruction	Story posttest: **genre elements, 0.86*** **organization, 0.90***		X [185]					X [186]	X [187]

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	**Setting**	**Analytic Sample Size**[145] **and Population**	**Treatment**	**Outcome, Effect Size**[147]	**Strategies**	**Gradual Release**	**Select and Use Strategies**	**Flexible Use**	**Purpose**	**Audience**[148]	**Exemplary Texts**	**Genre Techniques**
Garcia and de Caso-Fuertes (2007) *RCT*	Small group or paired	99 students in 5th and 6th grade in Spain who were at risk	**Intervention Group (Dosage)**[146]**:** reflexive writing process with strategies small groups of 6–8 students (25 sessions, 50 minutes each) **Comparison Group**[149]**:** regular classroom instruction	Descriptive: **output, 0.59*** Narrative: **output, 0.64*** Essay: **output, 0.57***	X			X	X	X		X
Troia and Graham (2002) *RCT*	Small group or paired	20 students in 4th and 5th grade who were at risk	**Intervention Group (Dosage)**[146]**:** highly explicit strategy instruction pairs (7 sessions, averaging 75 minutes each) **Comparison Group**[149]**:** process writing instruction with pre-instruction in the elements of a good story and essay, including identifying parts in a model text[193] (7 sessions, averaging 77 minutes each)	Story posttest: **overall writing quality, 0.83 (ns)** output, −0.09 (ns) Persuasive posttest: **overall writing quality, −0.48 (ns)** output, 0.16 (ns) Maintenance effects (4 weeks), story:[188] **overall writing quality, 1.71*** **output, 1.19 (ns)**	X	X [189]	X		X	X [190]	X [191]	X [192]

(continued)

Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Study testing the effectiveness of partially aligned interventions on typically achieving students

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Dressel (1990) *RCT*	Whole class	48 students in 5th grade	**Intervention Group (Dosage)[146]:** high-quality literature (49 sessions, 45–60 minutes each) **Comparison Group[149]:** lesser-quality literature	**overall writing quality, 0.48*** **genre elements, 0.55*[194]**							X	
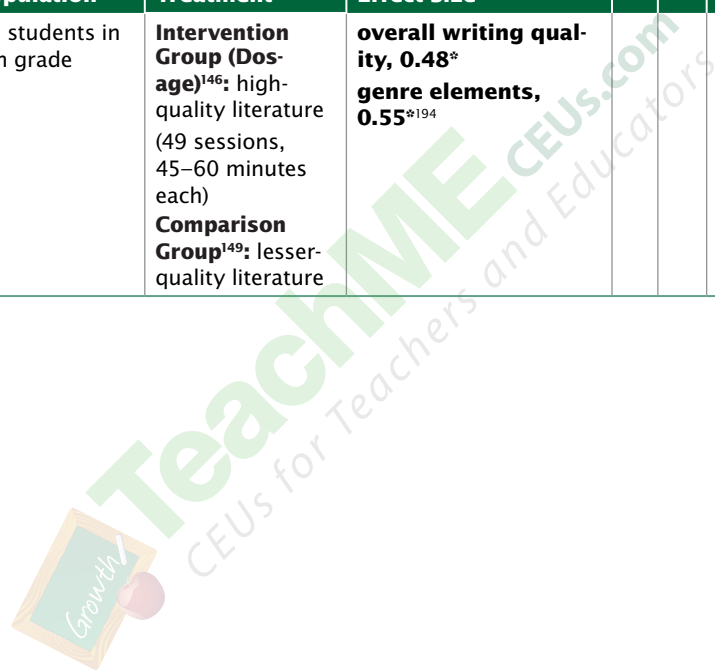
Table D.3. Studies that contribute to the level of evidence for Recommendation 2 *(continued)*

Studies testing the effectiveness of partially aligned interventions on students who were at risk and gifted

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Citation and Design[144]	Setting	Analytic Sample Size[145] and Population	Treatment	Outcome, Effect Size[147]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[148]	Exemplary Texts	Genre Techniques
Berninger et al. (2006) Study 4 *RCT*	Whole class	90 students in 4th grade who were at risk	**Intervention Group (Dosage)[146]:** after-school writing clubs whole class in addition to regular instruction (64 sessions, 60 minutes each) **Comparison Group[149]:** regular classroom instruction	**sentence structure, 0.63 (ns)**						X		X [195]
Berninger et al. (2002) *RCT*	Small group or paired	24 pairs of students in 3rd grade who were at risk	**Intervention Group (Dosage)[146]:** composing instruction[196] pairs (24 sessions, 20 minutes each) **Comparison Group[149]:** keyboarding and writing practice	Informative: **overall writing quality, 0.40 (ns)** Persuasive: overall writing quality, 0.18 (ns) mechanics, 0.12 (ns) sentence structure, −0.14 (ns)								X
Jampole, Mathers, and Konopak (1994) *RCT*	Small group or paired	87 students in 3rd and 4th grade who were gifted	**Intervention Group (Dosage)[146]:** imagery training[197] small groups (8 sessions, 45 minutes each) **Comparison Group[149]:** writing practice	Posttest: **overall writing quality, 0.93* ideation, 0.68*** Maintenance effects (1 month): **overall writing quality, 0.41 (ns)** ideation, 0.20 (ns)	X							

Table D.4. Studies that contribute to the level of evidence for Recommendation 2

Studies testing the effectiveness of self-regulated strategy development on typically achieving students

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Study Citation and Design[198]	Setting	Analytic Sample Size[199] and Population	Treatment	Outcome, Effect Size[201]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[202]	Exemplary Texts	Genre Techniques
Danoff, Harris, and Graham (1993) *SCD*	Whole class	3 students in 4th and 5th grade[204]	**Intervention Group (Dosage)[200]:** SRSD instruction whole class[205] (9–11 lessons; minutes unknown) **Comparison Group[203]:** regular classroom instruction	genre elements, positive effects[206]	X	X	X		X	X	X	X
Zumbrunn (2010) *SCD*	Small group or paired	6 students in 1st grade	**Intervention Group (Dosage)[200]:** SRSD instruction pairs (10–12 sessions, 20–30 minutes each) **Comparison Group[203]:** regular classroom instruction	output, positive effects	X	X	X		X	X	X	X
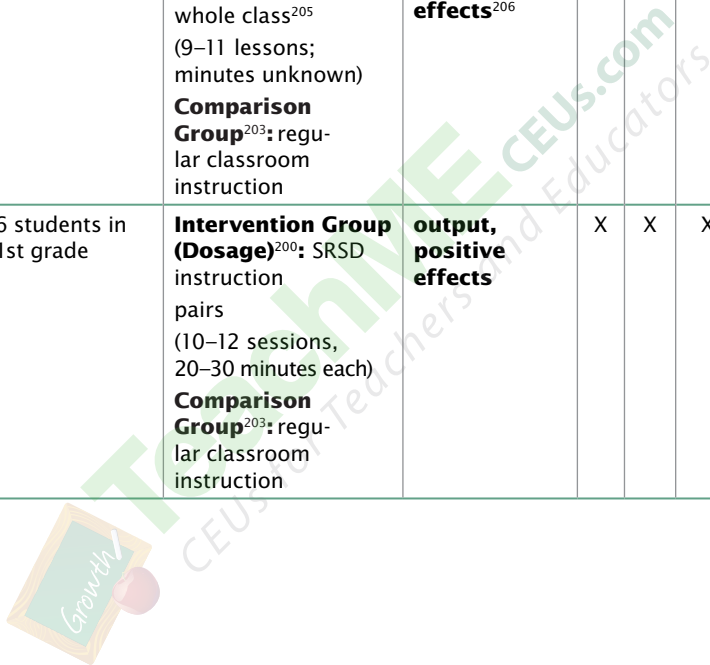
(continued)

Table D.4. Supplemental evidence supporting the effectiveness of Recommendation 2 *(continued)*

Studies testing the effectiveness of self-regulated strategy development on students who were at risk

| Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Study Citation and Design[198]	**Setting**	**Analytic Sample Size**[199] **and Population**	**Treatment**	**Outcome, Effect Size**[201]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[202]	Exemplary Texts	Genre Techniques
Graham and Harris (1989) *SCD*	Small group, paired, or individual	3 students in 6th grade who were at risk	**Intervention Group (Dosage)**[200]**:** SRSD instruction small groups (5–8 sessions, 40 minutes each) **Comparison Group**[203]**:** regular classroom instruction	Persuasive: **genre elements, positive effects**	X	X	X		X	X	X	X
Graham et al. (1992) *SCD*	Small group, paired, or individual	4 students in 5th grade who were at risk	**Intervention Group (Dosage)**[200]**:** SRSD instruction individual (6–8 sessions, 40 minutes each) **Comparison Group**[203]**:** preteaching in using a word processor and typing as well as the elements of a good story and essay, including identifying parts in a model text	Persuasive: **genre elements, positive effects**	X	X	X		X	X	X [207]	
Lane et al. (2008) *SCD*	Small group, paired, or individual	6 students in 2nd grade who were at risk	**Intervention Group (Dosage)**[200]**:** SRSD instruction with minor modifications for students with behavioral challenges individual (10–15 sessions, 30 minutes each) **Comparison Group**[203]**:** regular classroom instruction	Story: **genre elements, positive effects**	X	X	X		X	X	X	X

(continued)

Table D.4. Supplemental evidence supporting the effectiveness of Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Study Citation and Design[198]	Setting	Analytic Sample Size[199] and Population	Treatment	Outcome, Effect Size[201]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[202]	Exemplary Texts	Genre Techniques
Lienemann et al. (2006) *SCD*	Small group, paired, or individual	6 students in 2nd grade who were at risk	**Intervention Group (Dosage)[200]:** SRSD instruction individual (6–8 sessions, 30–45 minutes each) **Comparison Group[203]:** regular classroom instruction	Story: **genre elements, positive effects**	X	X	X		X	X	X	X
Mason and Shriner (2008) *SCD*	Small group, paired, or individual	6 students in 2nd through 5th grade who were at risk	**Intervention Group (Dosage)[200]:** SRSD instruction with minor modifications for students with behavioral challenges in addition to regular instruction individual (11–13 sessions, 30 minutes each) **Comparison Group[203]:** regular classroom instruction	Persuasive: **genre elements, positive effects**	X	X	X		X	X	X	X
Saddler (2006) *SCD*	Small group, paired, or individual	6 students in 2nd grade who were at risk	**Intervention Group (Dosage)[200]:** SRSD instruction pairs (10–11 sessions, 30 minutes each) **Comparison Group[203]:** regular classroom instruction	Story: **overall writing quality, positive effects genre elements, positive effects output, positive effects**	X	X	X		X	X	X	X
Saddler et al. (2004) *SCD*	Small group, paired, or individual	6 students in 2nd grade who were at risk	**Intervention Group (Dosage)[200]:** SRSD instruction in addition to regular instruction pairs (9–12 sessions, 25 minutes each) **Comparison Group[203]:** regular classroom instruction regular classroom instruction	Story: **genre elements, positive effects**	X	X	X		X	X	X	X

(continued)

Table D.4. Supplemental evidence supporting the effectiveness of Recommendation 2 *(continued)*

Study Details					2a. Teach Students the Writing Process				2b. Teach Students to Write for a Variety of Purposes			
Study Citation and Design[198]	Setting	Analytic Sample Size[199] and Population	Treatment	Outcome, Effect Size[201]	Strategies	Gradual Release	Select and Use Strategies	Flexible Use	Purpose	Audience[202]	Exemplary Texts	Genre Techniques
Troia, Graham, and Harris (1999) *SCD*	Small group, paired, or individual	3 students in 5th grade who were at risk	**Intervention Group (Dosage)[200]:** SRSD instruction individual (7 sessions, 60–90 minutes each) **Comparison Group[203]:** regular classroom instruction preteaching in the elements of a good story and essay, including identifying parts in a model text and techniques for story and essay writing (time unknown)	Story: **genre elements, positive effects**	X	X	X		X	X	X [208]	X
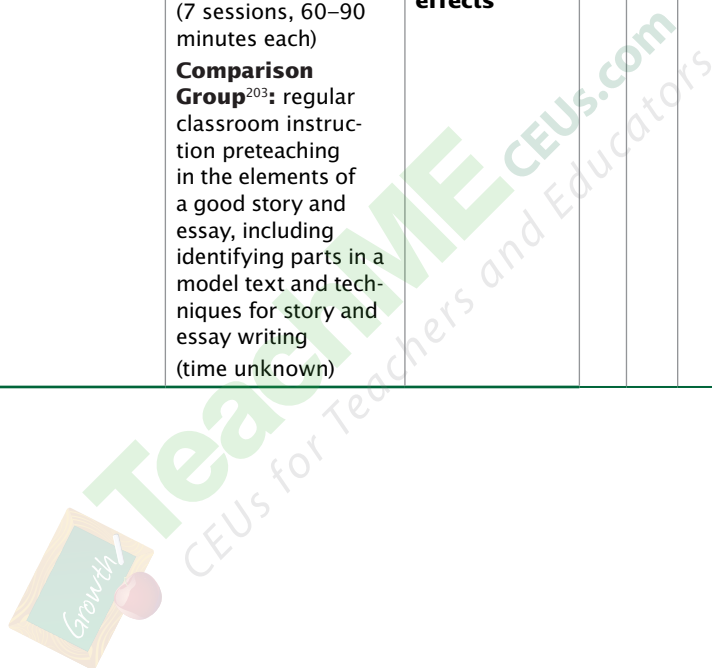
Studies testing the effectiveness of self-regulated strategy development (SRSD).
Seventeen of the studies examined interventions labeled as SRSD.[209] SRSD is an intervention that was originally developed to improve the writing performance of struggling writers and has since been tested in a wide variety of instructional settings among a variety of different student populations. The intervention typically includes all of the separate components recommended by the panel, with the exception of encouraging students to use strategies flexibly. The intervention also emphasizes teaching students the background knowledge they need to use the strategies targeted for instruction (one step in the gradual-release process). Students often are taught general strategies as well as techniques for writing in one or more genres. In some studies, this has involved teaching a general strategy for planning writing, called POW, as well as specific techniques to frame writing for different purposes, including WWW, TREE, or STOP and DARE (the POW strategy and these techniques are described in Recommendation 2).

Throughout the instructional sequence, students are taught different strategies to help them navigate the writing process and to regulate their writing behavior. For example, when writing a story, students often are taught to set goals for their writing (i.e., "I will include all seven story parts in my text" or "I will write a story that is fun to read"). The intervention also can include teaching self-instruction or things students can say to themselves to help them write, including for self-evaluation ("Does what I wrote make sense?") and self-reinforcement ("I used a great word!"). Students practice monitoring their performance by counting and graphing the number of parts they include in their writing.

The strategies and techniques usually are taught using gradual release of responsibility until the students are able to write well for a specific purpose without support from their teacher, peers, or the graphic organizers and charts supplied to help them internalize the strategy. During instruction, exemplary texts often are used to model the elements of strong stories and persuasive pieces for students. Students often read and respond to the writing of their peers to provide an audience for their writing. The instruction usually includes a component in which students discuss how they can select a strategy or technique to use in particular contexts, or how to adapt the strategy for use in other settings. In some cases, peers provide support to assist students with applying the strategies in other settings.

Studies of SRSD instruction, delivered to typically achieving students in a whole-class setting, showed uniformly positive effects on writing outcomes, including overall writing quality.[210] For example, in one study, typically achieving 3rd-grade students in a rural location received SRSD instruction in story writing in a whole-class setting.[211] The SRSD instruction entailed instruction in a general strategy (POW) for planning, organizing, and expanding student ideas, as well as a technique (WWW) for including the seven parts of a good story in their writing. First, students practiced identifying the parts of an exemplary story (included in the WWW strategy) and were explicitly taught how to apply the POW and WWW strategies together. Students were taught when and how to use the strategies, and they were told that these strategies could be transferred to other contexts. Teachers modeled how to use the strategies, and students practiced using the strategies collaboratively and later independently. Throughout the instruction, the teacher modeled and explained self-regulation strategies, including setting a goal to include all seven parts of a story in their writing and graphing their progress toward meeting this goal. Students receiving SRSD instruction wrote stories with higher overall quality relative to a comparison group that received regular classroom instruction. Students who received instruction in SRSD also included more story elements in their writing and produced more text. The intervention also produced positive effects on the overall quality of students' narrative writing, a similar but uninstructed genre, as well as the number of narrative elements and the quantity of text produced in this genre.

Another study examined the effectiveness of SRSD instruction for typically achieving suburban 4th- and 5th-grade students.[212] Instruction covered the same strategies, techniques, and instructional components as the previous study. The intervention was associated with students including more story elements in their writing than they did prior to receiving the intervention.

Two other studies examined the effectiveness of SRSD instruction delivered to pairs or small groups of typically achieving students.[213] In one study of 4th-graders in Germany, small-group instruction in SRSD produced positive effects on the overall quality of students' writing, as well as the number of story elements they included in their writing, relative to students' regular instruction.[214] The study also showed positive effects on students' overall writing quality and the number of story elements included on a maintenance test five weeks later.[215] The other study took place in a predominantly middle-class midwestern elementary school in the United States and produced positive effects on the quantity of text students produced.[216] The effects of SRSD instruction were larger when it was delivered to small groups or pairs of students.

Other studies tested the effectiveness of instruction in SRSD on students with learning disabilities or otherwise at risk for writing difficulties.[217] For example, in one study, an instructor taught individual students general strategies and a technique for persuasive writing (TREE) using gradual release of responsibility until students could apply the technique independently.[218] Participants also were taught to think about their audience and purpose for writing, self-regulation strategies (such as self-evaluation and self-reinforcement) to improve their writing of exemplary texts, and how the technique could be modified for use in other writing projects. All participants were identified as students with learning disabilities. The intervention led students to include more persuasive elements in their writing. A similar intervention for story writing (using the WWW technique instead of TREE) found positive effects on students' overall writing quality, the number of story elements they included in their writing, and the quantity of text they produced.[219]

The remaining studies that tested SRSD interventions on students at risk for writing difficulties varied in the specific combination of strategies taught and contained minor variations in instruction, but the basic instructional model followed a similar pattern.[220] They produced almost universally positive effects on measures of overall writing quality as well as genre elements and output. Across 13 studies of SRSD interventions among students with learning disabilities, 10 showed consistently positive effects on all posttest outcomes that met standards including overall writing quality,[221] genre elements,[222] and quantity of text produced,[223] as well as maintenance outcomes[224] and outcomes that tested transfer to other, uninstructed, genres of writing.[225]

Two more studies tested the effectiveness of SRSD with an added peer-support component relative to students' regular classroom instruction.[226] The peer-support component was designed to help students apply SRSD to writing in other contexts. It involved students discussing with the instructor when the strategy could be applied and how it could be adapted to a different context, setting goals and reminding their partner to use the strategy in another class, and discussing difficulties they encountered applying the strategies in different contexts (these practices are described in Recommendation 2a, action step 3). The studies showed positive effects on overall writing quality, genre elements, and output in two genres (story and persuasive), as well as on the same measures (story only) at a maintenance test 10 weeks later, relative to students who received their regular instruction in writing. However, positive effects on measures of transfer to other, uninstructed, genres were mixed with some instances of no effects. A final study examined the effectiveness of instruction in SRSD compared to direct instruction in strategies and found positive effects on genre elements and no

effects on overall writing quality.[227] The panel cautions that although the comparison group in this study did not receive the full SRSD intervention, it did receive instruction in the strategies and techniques associated with SRSD; therefore, smaller differences between the two groups are expected.

Four studies examined how small variations impacted the effectiveness of SRSD in addition to testing the effectiveness of the broader intervention and found mixed effects on a variety of outcomes.[228] Because, for the most part, these studies were small and tested only minor modifications to the panel's recommendation, the panel cautions against drawing strong conclusions from this group of studies.[229]

For example, two studies tested the effectiveness of an SRSD instruction model plus a peer-support component (described above) relative to SRSD alone.[230] The peer-support component was designed to help students apply the writing strategies they learned to other settings and contexts. The modifications (tested once on 3rd-graders and once on 2nd-graders) showed mixed effects on writing outcomes.

In the first study with a peer-support component, there were positive effects on the number of story elements students included in students' writing as well as the length of the stories they wrote; however, the peer-support components did not produce additional effects on story-writing quality and produced significant negative effects on students' persuasive writing.[231] The intervention also produced positive effects on the quality of students' writing in two uninstructed genres: narrative and informative writing.

The other peer-support study again found positive effects on the number of story elements and the length of students' stories, combined with no additional effects on story-writing quality; however, this study found positive effects on the quality of students' persuasive writing as well as the number of persuasive elements they included in their writing.[232] In

addition, the study found a mix of positive effects and no effects on measures of transfer to uninstructed genres. In short, the variation in peer support shows some promising results for teaching students to apply these strategies and techniques to uninstructed genres of writing; however, the inconsistent findings suggest that more study is needed to assess whether these variations in peer support do indeed improve writing quality.

In another example of small variation to SRSD, researchers compared the effectiveness of teaching strategies using the full SRSD model relative to the effectiveness of teaching strategies using only a partial, gradual release of responsibility for which the teacher did not fully relinquish control of the strategies.[233] Both interventions were delivered in small groups to 5th- and 6th-grade students. The full model produced negative effects on the overall quality of students' writing at posttest, mixed with positive effects and no effects on other outcomes measured at posttest and two different maintenance points.

Finally, one study examined the effectiveness of the full SRSD model compared to instruction in strategies without self-regulation strategies, among 4th-grade students in Germany.[234] Students who received the full model wrote higher quality stories with more story parts at posttest and at a maintenance test five weeks later. Thus, the panel believes it is important to teach students both the strategies for specific elements of the writing process and strategies such as goal setting and self-assessment for regulating their own writing.

Studies of goal setting. Another cluster of studies examined interventions that tested strategies and techniques related to goal setting.[235] These studies did not emphasize the other components of SRSD, although the SRSD interventions often included a goal-setting component. Generally, the effects of goal-setting interventions on overall writing quality were positive, though effects on other outcomes produced a mix of positive effects and no effects.

The interventions tested a variety of different types of goals. For example, some studies tested setting goals for students to learn a specific strategy (learning goals),[236] while others involved goals for students to include certain elements of a particular genre of writing in their pieces (specific goals).[237] Some of the studies of specific goals also included components designed to prompt students to consider the audience for whom they were writing (audience goals).[238] In all of the studies, students given learning or specific goals were compared with students given more general goals (e.g., a goal to write a good piece). The panel believes that goal setting is a powerful instructional tool to help students regulate their writing progress and focus on the concrete things they can do to write more effectively.

In one study, typically achieving 5th-grade students were taught a general planning strategy and given two different types of goals designed to help them learn and apply the strategy to their writing (learning goals).[239] One group was told, "While you're working, it helps to keep in mind what you're trying to do. You'll be trying to learn how to use these steps to write a descriptive paragraph."[240] The other group was told, "While you're working, it helps to keep in mind what you're trying to do. You'll be trying to write a descriptive paragraph."[241] Both types of goals helped students produce higher quality writing than students who received just a general goal to do their best in addition to instruction in the planning strategy; however, neither had an impact on the sentence quality of participating students. Though both types of goals had an impact on students' writing quality, the first goal was more effective at improving students' overall writing quality. This study was replicated among a group of 4th-grade students, and the authors continued to find positive effects of both types of goals on students' overall writing quality at posttest and at a maintenance test six weeks later. In this case, the goals also showed mostly positive effects on students' sentence structure, with the exception of the second goal at a six-week maintenance test.

Students in another study were tested individually using a prompt, which required students to write a persuasive letter.[242] The prompt included a set of goals for making students' writing more persuasive, such as "You have to remember that other people have different opinions about this issue, so you need to mention that other people have a different opinion." Students in 4th and 6th grade receiving the specific goals wrote higher quality text, relative to students who received the same prompt without the specific goals for making their writing more persuasive. The 6th-graders also included more elements of persuasive writing in their work.

Three other studies examined the effectiveness of setting specific goals for students at risk for writing difficulties, and these goals sometimes included specific prompts to help students consider the audience for their writing.[243] Two of these studies tested goals for revision of preliminary drafts.[244]

In one study, the same intervention produced positive effects on 6th-graders' overall writing quality, but the intervention produced no effects for 4th-graders.[245] Still another study tested specific goals with and without audience components and found that both had positive effects on students' overall writing quality.[246] However, students in the group with specific goals related to audience were more effective at increasing the number of genre elements included in their writing than students with the specific goal without an audience component. A final study found that a goal to add three things to their papers to make them better when they revised their writing led students to write higher quality and longer pieces, relative to students who were given a general goal to make their papers better.[247]

The panel cautions that authentic writing experiences do not typically come with specific, predetermined goals. Thus, although initially providing specific goals for students can be a useful instructional technique, students eventually will need to learn to set their own goals for their writing, with instructional supports removed.

Studies of moderately or closely aligned interventions. Other studies examined interventions that contained three or more components of Recommendations 2a and 2b (moderately or closely aligned) but did not fall into one of the previous large clusters of studies.[248] Studies of moderately aligned interventions delivered to typically achieving students in a whole-class setting produced positive effects on the overall quality of students' writing and the number of elements they included in their stories at posttest.[249] For example, in one study, classes of students learned how to use a rubric to self-evaluate their writing.[250] Students and teachers first discussed the six criteria assessed by the rubric (topic focus, organization, content, sentence structure, language, and mechanics) and practiced evaluating sample compositions on the different criteria. Some elements of the rubric prompted students to think about their audience and purpose for writing. These students wrote higher quality texts as assessed by the same rubric, compared to students who were not taught how to use the rubric.

In another study, 5th-grade students in Canada received instruction in narrative structure; instructional components included a teacher modeling the composition of a narrative while describing his or her thought processes.[251] The instructor then guided the students through discussion of a few narratives, including identification of the story parts and flexibility of the story categories. Students practiced writing collaboratively as a class and generated ideas in small groups. This was followed by practice composing narratives independently. Students who received instruction in narrative structure produced stories containing more story elements compared to students who received instruction in poetry following parallel procedures. At a maintenance test six weeks later, there were no longer differences between the two groups. Though both groups were instructed using a gradual release of responsibility and exemplary texts, the study isolates the effectiveness of instruction in a particular technique on the quality of writing in that particular genre.

Five more studies examined moderately or closely aligned interventions among students at risk for writing difficulties.[252] All but one[253] showed consistently positive effects on all writing outcomes, including writing quality. For example, one study examined the effectiveness of a student-editor strategy for revision and editing embedded in a process writing approach.[254] As part of the intervention, 4th- through 6th-grade students in a suburban school district met with their peers and used a revising strategy to suggest and discuss possible improvements to one another's papers. Following revisions, student pairs met again and used a checklist tool to suggest mechanical improvements. The strategies were taught using a gradual release of responsibility, and teachers also modeled how students could use the strategy to revise and edit their own writing. The intervention led to positive effects on the overall quality of students' writing relative to a comparison group that received regular instruction in process writing. Both groups practiced using a word processor to type. The intervention also contained engaging elements aligned with Recommendation 4; the panel cannot determine whether the intervention would have had the same effects without those components.

A final study of a closely aligned intervention on students who were at risk, discussed in greater detail in the later section on Recommendation 4, produced positive effects on the overall quality of students' story writing at posttest, as well as the quality and quantity of their writing at a maintenance test four weeks later, but there were negative effects on the quality of students' persuasive writing at posttest and no effects on two measures of writing output (story and persuasive) at posttest.[255] The intervention condition involved several components of the panel's recommendation; however, the comparison condition also featured elements of Recommendations 2 and 4. The mixed effects are not surprising, given that the effectiveness of some components of the panel's recommendations is being compared to the effectiveness of others.

Studies of partially aligned interventions.
A final group of studies examined interventions that were only partially related to the recommendations in this practice guide: those interventions with fewer than 30 percent of the components of the panel's recommendations that did not fall into one of the previous large clusters of studies.[256] One study examined the effectiveness of using high-quality exemplary texts compared to using low-quality texts as a model for student writing.[257] Before the pretest, the teacher discussed the 15 traits of high-quality literature (as defined by the criteria for the selection of ALSC Newbery Medal winners and "traits of the classical detective genre") with students and applied these traits to examples from stories and television. During the first half of each session, 5th-grade students assigned to the intervention group listened to high-quality literature as defined by the 15 traits, while students in the comparison group listened to lesser quality literature. Classroom discussions for both groups centered on how authors developed the 15 traits. Students practiced brainstorming and developing their own detective stories, but they were not explicitly told to use the stories that had been read aloud as models for their own writing. The intervention produced positive effects on the overall quality of students' writing and the number of elements they included in their stories.

Three more studies examined the effectiveness of partially aligned interventions on populations of students at risk for writing difficulties or on gifted students.[258] The studies produced generally positive effects on a variety of measures, including overall writing quality. However, in some cases, positive effects were mixed with no effects.[259] For example, in one study, gifted 3rd- and 4th-grade students learned to close their eyes and listen to passages with rich descriptions of sensory details.[260] Students then visualized what the passages were about and discussed their mental images with the class. After listening to the passages, the students practiced composing their own passages. The students who learned the strategy for visualizing wrote higher quality pieces with descriptions of more sensory categories (e.g., auditory, tactile) compared to a group that practiced listening to and discussing short stories and then practiced composing. The intervention did not produce effects in ideation.

Recommendation 3. Teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing.

Level of evidence: Moderate Evidence

The panel determined the level of evidence for this recommendation to be *moderate evidence*. The nine studies that contribute to the evidence rating for this recommendation included populations of students in 1st through 4th grade.[261] Seven of the nine studies that provide support for this recommendation were conducted with students who were at risk for writing difficulties,[262] and all but two of the studies involved instruction provided to pairs or small groups of students.[263] Supplemental evidence comes from one additional SCD study.[264] The panel cautions that the effects seen in these studies may not be replicated when the intervention is provided to a whole class or if the instruction is not tailored to areas of individual student need. However, the panel believes similar effects would be seen in whole-class instruction with some tailoring of instruction for individual students, such as providing handwriting instruction only to students struggling with handwriting.

Studies of the handwriting and spelling practices described in this recommendation showed generally positive effects on students' handwriting and spelling skills.[265] The instruction led students to write better sentences and sometimes to produce longer texts, providing preliminary evidence that as students focus less attention on handwriting and spelling, they are able to concentrate on conveying more of their ideas more effectively.[266] However, few studies tested the effect of these practices on the panel's primary outcome,

overall quality of students' writing, and those that did found no evidence that handwriting and spelling practices led to improvements. Moreover, the panel's decision to limit eligible outcomes to those that included the production of original text or norm-referenced standardized tests meant that there were few eligible measures of spelling and handwriting. Yet the panel believes instruction in handwriting and spelling will help students produce higher quality writing, because as basic writing skills become second nature, students can focus more of their attention on conveying their intended meaning.

Immediate effects of spelling and handwriting on overall writing quality are unlikely for two reasons. First, though the panel believes that instruction in these skills makes it easier for students to get their ideas written down, elementary students are likely to continue to face considerable challenges in spelling, handwriting, and word processing following a brief intervention. As students progress from kindergarten to 6th grade, these skills will gradually become more automatic, and students will increasingly focus on the quality of their writing. Moreover, freeing up students' attention to focus on the quality of their writing is likely to be ineffective in increasing writing quality without instruction and practice in the strategies and techniques they can use to convey their ideas more effectively. Thus, instruction in basic writing skills should be accompanied by instruction in tools for effective writing (Recommendation 2), as well as time allotted to practice such skills and tools (Recommendation 1), in order to produce gains in overall writing quality.

There was evidence that instruction in sentence-construction skills, focused on teaching students to craft clear sentences based on the conventions of Standard English, does lead to improvements in the overall quality of students' writing.[267] Because sentence-construction instruction emphasizes crafting strong sentences for the purpose of more effectively communicating the writer's meaning to his or her audience, the panel views the relation between sentence-construction instruction and overall writing quality as more direct than the relation between handwriting and overall writing quality.

Studies of word processing and typing interventions on eligible outcomes were limited. One study found that practicing writing using a word processor led students to produce longer texts, but no other eligible measures were assessed in the study.[268]

Table D.5 summarizes the studies cited to document the effectiveness of this recommendation. The characteristics of one study that provides supplemental evidence for this recommendation are included in Table D.6. The effects in these tables are separated into direct effects, defined as effects on the specific writing skill targeted by the intervention, and generalization effects, defined as effects on writing skills related to, but not directly targeted by, the intervention. The panel separately examined the research on the effectiveness of instruction in handwriting, spelling, sentence construction, and typing and word processing for this recommendation.

Table D.5. Studies that contribute to the level of evidence for Recommendation 3

Study Citation and Design[269]	Analytic Sample Size[270] and Population	Treatment	Direct Effects: Outcome, Effect Size[272]	Generalization Effects: Outcome, Effect Size[273]
Studies testing the effectiveness of handwriting interventions				
Berninger et al. (1997) *RCT*	40 students in 1st grade who were at risk	**Intervention Group (Dosage)[271]:** visual cue and memory retrieval training small groups (3) (24 sessions, 20 minutes each)[275] **Comparison Group[274]:** phonological awareness training	no eligible measures	**sentence structure, 0.89***
Denton, Cope, and Moser (2006) *RCT*	38 students in 1st through 4th grade who were at risk	**Intervention Group (Dosage)[271]:** therapeutic practice in addition to regular instruction[276] small groups (up to 3) (20 sessions, 30 minutes each) **Comparison Group[274]:** regular class-room instruction	Memory: handwriting (mechanics), 0.17 (ns) Dictated: **handwriting (mechanics), 0.44 (ns)** Copied: handwriting (mechanics), 0.08 (ns)	no eligible measures
Graham, Harris, and Fink (2000) *RCT*	36 students in 1st grade who were at risk[277]	**Intervention Group (Dosage)[271]:** supplemental handwriting program in addition to regular handwriting instruction individual (27 sessions, 15 minutes each) **Comparison Group[274]:** phonologi-cal awareness training in addition to regular handwriting instruction	no eligible measures	Posttest: overall writing quality, 0.04 (ns) **output, 1.29* sentence structure, 0.62 (ns)** Maintenance effects (6 months): **sentence structure, 0.84***
Studies testing the effectiveness of spelling interventions				
Berninger et al. (2000) Study 2 *RCT*	47 students in 3rd grade who were at risk	**Intervention Group (Dosage)[271]:** training on alphabetic principle and syllable awareness individual (24 sessions, 20 minutes each) **Comparison Group[274]:** keyboard training and training on alphabetic principle only	no eligible measures	**output, 0.34*[278]**
Berninger et al. (2002) *RCT*	24 students in 3rd grade who were at risk	**Intervention Group (Dosage)[271]:** spelling instruction[279] pairs (24 sessions, 20 minutes each) **Comparison Group[274]:** keyboard training and writing practice	spelling (mechanics), 0.21 (ns)	Informational: overall writing quality, 0.08 (ns) Persuasive: overall writing quality, −0.11 (ns) Other: sentence structure, 0.21 (ns)

(continued)

Table D.5. Studies that contribute to the level of evidence for Recommendation 3 *(continued)*

Study Citation and Design[269]	Analytic Sample Size[270] and Population	Treatment	Direct Effects: Outcome, Effect Size[272]	Generalization Effects: Outcome, Effect Size[273]
Graham, Harris, and Fink-Chorzempa (2002) *RCT*	30 pairs of students in 2nd grade who were at risk[280]	**Intervention Group (Dosage)[271]:** spelling instruction in addition to regular spelling instruction pairs (48 sessions, 20 minutes each) **Comparison Group[274]:** math instruction in addition to regular handwriting instruction	no eligible measures	Posttest: **output, −0.42 (ns) sentence structure, 0.77 (ns)** Maintenance effects (6 months): output, 0.06 (ns) **sentence structure, 0.58 (ns)**
Studies testing the effectiveness of sentence-construction interventions				
Fogel and Ehri (2000) *RCT*	59 students in 3rd and 4th grade who were at risk	**Intervention Group (Dosage)[271]:** exposure to text, explicit instruction in Standard English conventions, guided practice, and feedback[281] whole class[282] (2 sessions, total of 60 minutes) **Comparison Group[274]:** exposure to text only	no eligible measures	**output, 0.27 (ns)**
Saddler and Graham (2005) *RCT*	21 to 22 pairs of students in 4th grade[283]	**Intervention Group (Dosage)[271]:** sentence-combining instruction pairs (30 sessions, 25 minutes each) **Comparison Group[274]:** traditional grammar instruction pairs	**sentence structure, 1.80* (MSW), 1.45* (LSW)[284]**	overall writing quality, **0.52 (ns, MSW), 0.51 (ns, LSW)** output, **−0.65 (ns, MSW)**, −0.13 (ns, LSW)[285]
Studies testing the effectiveness of typing/word-processing interventions				
Jones (1994) *RCT*	20 students in 2nd grade	**Intervention Group (Dosage)[271]:** "magic slate" word processor large groups (10) (4 weeks; time unknown) **Comparison Group[274]:** regular classroom instruction	no measures	**output, 0.48*[286]**

Table D.6. Supplemental evidence supporting the effectiveness of Recommendation 3

Study Details				
Study Citation and Design[287]	Analytic Sample Size[288] and Population	**Intervention Group (Dosage)[289]** **Comparison Group[292]**	Direct Effects: Outcome, Effect Size[290]	Generalization Effects: Outcome, Effect Size[291]
Studies testing the effectiveness of spelling interventions				
Gettinger (1993) *SCD*	4 students in 2nd grade, half of whom were at risk and half of whom were above average	**Intervention Group (Dosage)[289]** direct instruction individual (24 sessions, 15 minutes each) **Comparison Group[292]** invented spelling	spelling, mixed effects[293]	no eligible measures
Studies testing the effectiveness of sentence-construction interventions				
Saddler, Behforooz, and Asaro (2008) *SCD*	6 students in 4th grade who were at risk	**Intervention Group (Dosage)[289]** sentence-combining instruction pairs (18 sessions, 25 minutes each) **Comparison Group[292]** regular classroom instruction	sentence structure, no effects	**overall writing quality, positive effects**

Handwriting. Handwriting instruction—specifically instruction whereby students are taught how to form letters, given opportunities for repeated practice in short sessions, and practice handwriting in the context of authentic writing opportunities—can lead to improvements in spelling, sentence structure, and writing output. Three studies provide causal evidence for this component of the panel's recommendation.[294] In the first, urban and suburban 1st-grade students who were at risk met individually with tutors, who administered lessons in the alphabet and modeled letter formation.[295] This was followed by student practice forming letters, sentence-copying and progress-tracking activities, and handwriting "fun," whereby students incorporated target letters into pictures or wrote letters in unusual ways. Students in the comparison condition received instruction in phonological awareness. The intervention led to positive effects on students' sentence construction and writing output, but it produced no effects on the overall quality of students' writing. The positive effects on sentence construction persisted at maintenance, six months later.

In a similar study, suburban 1st-grade students who were at risk for writing difficulties practiced viewing letters marked with numbered arrows and then covering them up and writing the letters from memory.[296] Gradually, graduate student tutors increased the length of time the letters were covered before the students wrote them from memory. Handwriting instruction took place for 10 minutes twice a week in small groups. Students in the comparison group received instruction in phonological awareness. Instruction in both groups was supplemented with practice composing and sharing work, along with graphing progress throughout the intervention. Students in the intervention group outperformed students in the comparison group on measures of sentence construction. The panel believes that the effects reported for this study and the previous study may underestimate the true impact of the intervention since the phonological awareness training provided to the comparison group also would be expected to improve writing outcomes for students.

Researchers in a third study examined the effectiveness of individual or small-group handwriting instruction that included worksheets to practice handwriting by copying, in response to dictation, and from memory, as well as practice applying handwriting skills to "real-life" writing and writing for fun.[297] Participants in the study were 1st- through 4th-grade students who were at risk for writing difficulties. Meanwhile, students in the comparison group received their regular in-class instruction. The intervention led to positive effects on a dictated scale of handwriting ability but no effects on memory or copied scales.

Spelling. Explicit instruction in the underlying patterns of words (e.g., phonological awareness, spelling phonics, and morphological spelling) can lead to achievement gains in spelling that transfer to other writing outcomes.[298] Three studies examined interventions in which students were taught the underlying patterns of words.[299] In one study, 3rd-grade students who were at risk for spelling difficulties received paired instruction in morphological spelling, supplemented with instruction in spelling phonics.[300] The study found large positive effects on students' composition length compared to a comparison group that received only instruction in spelling phonics. The authors reported that students in the treatment condition outperformed students in the comparison condition on a measure of writing output.

In another study, 3rd-grade students who were at risk in an urban region received paired, explicit instruction in phonological awareness and spelling phonics.[301] The control group practiced writing and typing. The intervention produced no effects on two measures of overall writing quality. Standardized measures of spelling and sentence structure favored the treatment group but did not reach significance or substantive importance.

In a third study, 2nd-graders who were at risk in an urban region received paired instruction in phonological awareness, spelling phonics,

and morphological spelling using a variety of activities including word sorting, word hunting, word spelling, phonics warm-up, and word building.[302] Students in the comparison group received math instruction. The intervention led to positive effects on a measure of sentence structure at posttest and at maintenance; however, it also found negative effects on writing output at posttest. By the maintenance test, there were no effects on writing output.

The panel also believes that instruction in the spelling of specific words can lead to improvements in writing quality. One study, described earlier, examined instruction in commonly used words, in addition to instruction in spelling skills including phonological awareness, spelling phonics, and morphological spelling.[303] The results suggest that a spelling-instruction program that includes instruction in spelling skills and word study can produce positive effects on students' writing output and sentence structure. However, the effectiveness of the word-study component alone cannot be isolated. Another study alternated individualized direct instruction in the spelling of specific words with instruction in invented spelling and found no effects on spelling for three students and positive effects for the direct instruction condition for one student.[304] The panel cautions against drawing conclusions from this study because it compares the effectiveness of one intervention recommended by the panel to the effectiveness of another. The panel believes that both interventions are likely to improve students' spelling outcomes and therefore that the mixed effects are not surprising.

No studies that met WWC evidence standards tested the effectiveness of instruction in using a dictionary, or spelling by analogy. However, the panel believes instruction in these skills will help students when they are uncertain about how to spell specific words, and that teachers should build on a strong foundation in phonological awareness, spelling phonics, and morphological spelling skills to develop these strategies.

Sentence construction. Explicit instruction in sentence construction—along with opportunities to practice sentence-construction skills within authentic writing experiences—can produce positive effects on sentence structure, writing output, and overall writing quality.[305] Two studies provide causal support for this practice.[306] One study provides supplemental evidence for this practice.[307] Two of the studies tested sentence-combining interventions similar to those recommended by the panel.[308] The first compared the effectiveness of explicit instruction in sentence combining, along with practice applying sentence-combining skills to authentic writing, to traditional grammar instruction, primarily in parts of speech.[309] Instruction was delivered to pairs of 4th-grade students in an urban location. Each pair included a more-skilled writer and a less-skilled writer. At the conclusion of the study, there were positive effects favoring the intervention condition on a standardized test of sentence construction and on overall writing quality for both more- and less-skilled writers. There were negative effects on writing output for the more-skilled writers; however, the panel did not view these as problematic, because the purpose of combining sentences is to say the same thing in fewer sentences.

The second study examined the effectiveness of sentence-combining instruction that was similar to the instruction in the first study but included a peer-support component for urban 4th-graders who were at risk.[310] Writing samples collected following the intervention showed positive effects on writing quality but no effects on sentence structure.

A third study also supports the panel's recommendation that instruction in applying standard conventions for sentence writing be embedded in students' own compositions.[311] In the study, 3rd- and 4th-graders were exposed to stories modeling Standard English features, provided exposure and instruction on the rules of Standard English, and given guided practice in applying the rules of Standard English to their writing. Students

in the comparison condition received only story exposure. Though the instruction was delivered to the whole class, the researchers examined only the effects on African American students who displayed characteristics of Black English Vernacular in their writing. The group receiving the full intervention wrote longer stories at posttest than students exposed to stories only. Though this study involved a very specific population and type of sentence-construction instruction, the panel believes that the instructional techniques could be adapted easily to other sentence-construction lessons.

Typing and using a word processor.

Practice using a word processor can lead to an increase in writing output over using pencil and paper.[312] Second-grade students practiced writing on a word processor, while a comparison group of students from the same elementary school practiced using pencil and paper.[313] After four weeks of practice, both groups were assessed using pencil and paper, and the intervention group produced more text. No studies that meet WWC evidence standards examined the impacts of typing practice on writing outcomes.

Recommendation 4: Create an engaged community of writers.

Level of evidence: Minimal Evidence

The panel assigned a rating of *minimal evidence* to this recommendation based on five studies that meet WWC standards with or without reservations and include components of Recommendation 4 (see Tables D.7 and D.8).[314] Though the majority of the findings were positive,[315] one study found negative effects as well as positive effects,[316] and one SCD study found no effect.[317] The outcomes included overall writing quality and writing output. Researchers conducted the studies in 3rd- through 6th-grade classrooms, with two of the studies taking place in countries other than the United States.[318] The interventions tested in the studies varied in how closely they were aligned to the recommendation. One study contained fewer than 30 percent of the components the panel believes contribute to the creation of an engaged community of writers (partially aligned). Three contained at least 30 percent, but fewer than 80 percent, of the components (moderately aligned), and two of the studies contained at least 80 percent of the components (closely aligned).[319]

The panel cautions that although the studies meet WWC standards and primarily were delivered to the whole class, the findings may not be replicated in all settings. Because strategy instruction was combined with practices contributing to an engaged community of writers in four of the six studies, it is not possible to determine how much of the effect is due to the strategy instruction and how much of the effect is due to the building of a community of engaged writers.[320] One of the studies that did not include strategy instruction found positive effects on overall writing quality.[321] Writers who were at risk were the focus of three of the studies;[322] however, the effects are similar in magnitude for studies that did not focus on writers who were at risk.[323]

Table D.7. Studies that contribute to the level of evidence for Recommendation 4

Study Details				Action Steps Tested					
Study Citation and Design[324]	Analytic Sample Size[325] and Population	Treatment	Outcome, Effect Size[327]	Teacher Participation	Writing Choices	Collaboration	Feedback	Publication	Study Tested an Intervention That Included Components of Recommendation 2
Curry (1997) *QED*	56 students in 4th grade who were at risk	**Intervention Group (Dosage):**[326] Writer's Workshop focused on process of writing in an inclusive setting whole class (32 sessions, 45 minutes each) **Comparison Group**[328]: skills-based direct instruction	**overall writing quality, 0.44 (ns)**[329]	X	X	X	X	X	X
MacArthur, Schwartz, and Graham (1991) *RCT*	29 students in 4th through 6th grade who were at risk	**Intervention Group (Dosage)**[326]: student-editor strategy whole class (6–8 weeks, no additional information on dosage) **Comparison Group**[328]: skills-based direct instruction Writer's Workshop	**overall writing quality, 1.42***[330]		X	X	X		X
Pritchard and Marshall (1994) *QED*	1,292 students in 3rd through 6th grade	**Intervention Group (Dosage)**[326]: staff development by teacher consultants in National Writing Project whole class (no dosage information) **Comparison Group**[328]: skills-based direct instruction regular classroom instruction	**overall writing quality, 0.39 (unknown)**[331]			X		X	X
Troia and Graham (2002) *RCT*	20 students in 4th through 5th grade who were at risk	**Intervention Group (Dosage)**[326]: process writing instruction whole class (7 sessions, averaging 77 minutes each) **Comparison Group**[328]: highly explicit strategy instruction pairs (7 sessions, averaging 75 minutes each)	Story posttest: **overall writing quality, −0.83 (ns)** output, 0.09 (ns) Persuasive posttest: **overall writing quality, 0.48 (ns)** output, −0.16 (ns) Maintenance effects, story (4 weeks):[332] **overall writing quality, −1.71* output, −1.19 (ns)**	X		X	X	X	X

(continued)

Table D.7. Studies that contribute to the level of evidence for Recommendation 4 *(continued)*

Study Details				Action Steps Tested					
Study Citation and Design[324]	**Analytic Sample Size**[325] **and Population**	**Treatment**	**Outcome, Effect Size**[327]	Teacher Participation	Writing Choices	Collaboration	Feedback	Publication	Study Tested an Intervention That Included Components of Recommendation 2
Yarrow and Topping (2001) *RCT*	28 students who were 10 and 11 years old in Scotland	**Intervention Group (Dosage)**[326]**:** paired writing process: more-able writers tutored less-able writers whole class (24 sessions, no additional information on dosage) **Comparison Group**[328]**:** individual writing process	**overall writing quality, 0.58 (ns)**			X	X	X	
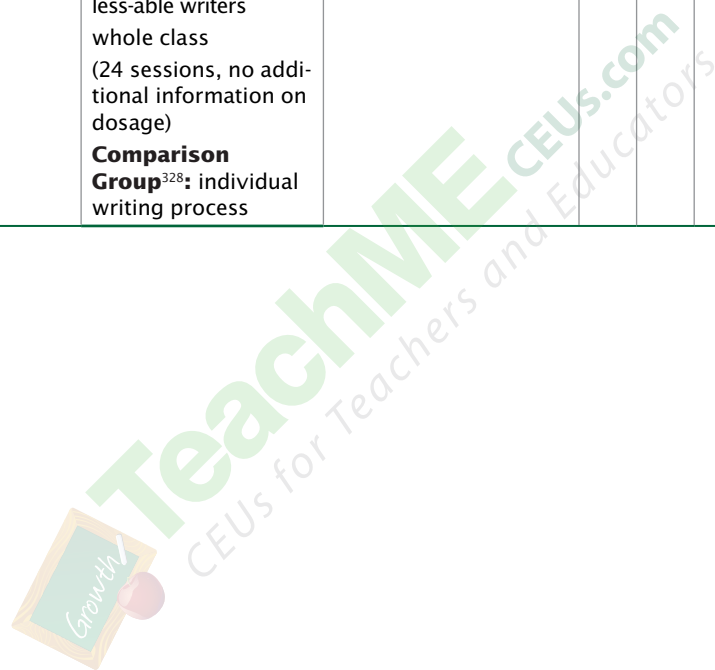
Table D.8. Supplemental evidence supporting the effectiveness of Recommendation 4

Study Details				Action Steps Tested					
Study Citation and Design[333]	Analytic Sample Size[334] and Population	Intervention Group (Dosage)[335] / Comparison Group[337]	Outcome, Effect Size[336]	Teacher Participation	Writing Choices	Collaboration	Feedback	Publication	Study Tested an Intervention That Included Components of Recommendation 2
Jerram, Glynn, and Tuck (1988) *SCD*	24 students in 5th grade in New Zealand	handwritten feedback from the teacher, focusing on content whole class (116 sessions, 15 minutes each) / no written feedback on content	writing output, no effects				X		

Studies of interventions closely aligned with the panel's recommendation

Two studies examined interventions closely aligned with the panel's recommendation, finding both positive and negative effects.[338] The first study examined the effect of a Writer's Workshop compared to skills-based instruction for writers who were at risk in 4th grade in an urban school district.[339] A Writer's Workshop typically involves teacher participation in writing; student choice of topics; students' review of one another's work, providing opportunities for feedback and collaboration; and publishing of writing. The intervention tested included teacher participation, student choice of topics, peer editing, teacher conferencing—a form of feedback—and publishing of class books. Compared to students receiving skills-based direct instruction, a program that emphasized spelling, punctuation, capitalization, and grammar, the Writer's Workshop students produced higher quality writing. However, the intervention also involved the use of a process approach to writing whereby students moved through the elements of the writing process flexibly, a key component of Recommendation 2.

The second study estimated the impact of a process writing approach compared to highly explicit strategy instruction delivered in pairs.[340] Students were writers in grade 4 or grade 5 who were at risk in a suburban elementary school. Students in both the process writing and strategy instruction groups received pre-instruction to familiarize them with the structure and elements of stories and persuasive essays. Students in the process writing group reviewed and received direct instruction in the four steps of writing: drafting, revising, proofreading and editing, and publishing. The teacher modeled using the four steps to write a story. Each student collaborated with the teacher to write a story, which was shared with a partner for feedback, revised, and ultimately published in a bound portfolio. The researchers found positive effects on overall writing quality for persuasive essays immediately following the intervention. Negative effects were found for overall story-writing quality immediately following the intervention and four weeks later for overall story-writing quality and story output. The panel cautions that the negative effects were observed when the engaging practices were compared to instruction in specific writing strategies, an approach that is closely aligned to practices addressed in Recommendation 2 and that also included some engaging elements. The panel recommends providing an engaged community of writers in addition to, not instead of, practices in Recommendation 2.

Studies of interventions moderately aligned with the panel's recommendation

Researchers examined interventions moderately aligned with the panel's recommendation in three studies and found positive effects on overall writing quality.[341] Students identified as writers who were at risk in suburban 4th-grade through 6th-grade classrooms learned to use structured peer meetings within a Writer's Workshop classroom.[342] The intervention included opportunities for student choice of topics, collaboration, and feedback. Pairs of students held two meetings. The first meeting focused on substantive revisions that could be made in their work. Students were given specific instructions to do the following: listen and read along as the author read aloud, discuss what the paper was about and what the editor/listener liked best, reread the paper quietly and make notes about revision questions, and discuss the editor's suggestions with the author. In the second meeting, students focused on correction of mechanical errors in the writing. Teachers provided a checklist focusing on four common errors: complete sentences, capitalization, punctuation, and spelling. The students in this student-editor group produced higher quality papers than students who participated in the Writer's Workshop without these structured opportunities for collaboration.[343]

Another study examined the effect of teacher professional development on the writing of students attending grade 3 through grade 6 in urban, suburban, and rural districts.[344] The intervention involved teachers training other teachers in writing techniques associated with the National Writing Project. A year after the professional development, the researchers reported that students taught by trained intervention teachers had higher quality writing than students taught by teachers who were not trained. At that time, the teachers completed a survey that focused on whether they used the practices emphasized in the training in their classrooms; researchers reported statistically significant differences in the frequency of the use of 9 of 13 practices between the trained and nontrained teachers, including that trained teachers used peer groups and published student writing more often. However, only 40 percent of trained teachers and 19 percent of untrained teachers responded to the survey, and the WWC could not confirm that differences were statistically significant. The panel cautions that the emphasis on engaging practices was only part of a broad intervention; therefore, it is impossible to determine whether the differences between the two groups resulted from the engaging practices emphasized by the National Writing Project.

Researchers in Scotland examined the effectiveness of paired writing with structured interaction and paired writing without interaction for 10- and 11-year-old students.[345] Both groups of students were trained in paired writing, including specific roles to facilitate peer-assisted learning through prompting. Students in the intervention group were paired and assigned specific roles. The control group worked in pairs only for the training sessions and practiced writing individually. Following the intervention, students were assessed individually; students who practiced writing in pairs wrote higher quality pieces than their peers who practiced writing individually.

Studies of interventions partially aligned with the panel's recommendation

Researchers conducted a study in which the amount of teacher feedback varied for 5th-grade students in suburban New Zealand.[346] The intervention tested the impact on writing output when the teacher provided detailed written comments on the students' writing nightly, compared to writing output when the teacher told students she was too busy to provide comments on their writing. The study showed no evidence of an effect.

"This document was developed from the public domain document: Teaching Elementary School Students to Be Effective Writers - 2018 Update – U.S Department of Education, National Center for Education Evaluation and Regional Assistance (NCEE)."

PART 2:

Introduction

Literacy, or a set of numeric and verbal recognition and skills, is a foundational component of any child's education. Whether or not these skills are established early for a child may well make or break that child's chances of ongoing success, as they are completely integral. Beyond school, children will require basic literacy skills in order to enjoy the social and economic future for which schools prepare them.

As literacy constitutes a necessary skill, schools must shoulder the responsibility of helping children acquire it, practice it, and master it. Only then will a student be able to truly control his or her destiny - and potential. Understanding that literacy is a key that opens a door to opportunities helps inform the way that we can invest in our communities - both locally and globally.

Ensuring that our students are able to improve their own literacy skills from an early age is one of the best ways that we can help them secure their successful future.

Section 1: The Importance of Literacy

Literacy opens doors for students, it establishes a framework for universal communication, and it acts as a required prerequisite and firm foundation for any future studies a child may undertake. Its importance cannot be understated; but, first - what, precisely, is literacy? How does a child first learn it? What are its direct benefits, and what are the barriers to it that currently stand in our way?

We'll start with a definition.

What is literacy?

The minimal definition of literacy is simple: Someone who is literate knows how to read, count, and write. The word can also be used to describe knowledge or competency in a specific area, such as in the phrase 'he was computer-literate,' but for the purposes of this course, we refer to the basic skills of vocabulary, writing, speaking, and reading, as well as number recognition and use (University of South Florida, 2020).

Therein lies the first assumption. Are these skills basic? For many, they may be considered foundational, innate, or almost assumed; for others, early literacy is a pinnacle of achievement and privilege.

UNESCO - or the United Nations Educational, Scientific and Cultural Organization - has led a worldwide initiative for over half a century to establish the right to literacy for all. Reading and writing are prerequisites, in many cases, for a good education. Not only that: UNESCO notes that literacy has a 'multiplier effect' that empowers the literate to be productive members of society. Those who are literate, UNESCO continues to say, tend to have a higher ability to contribute to and improve their own livelihoods (UNESCO, 2019).

In this way, literacy can be seen as a driver for community development. It can be linked to improved family and childhood health, development, and nutrition. Increased and improved levels of literacy can play a part in reducing poverty and opening doors to those who may currently have few options (UNESCO, 2019).

Literacy in its most basic form refers to reading, writing, and counting - as noted above. However, in modernity, literacy tends to carry with it an expanded definition. Now, if one is literate, that tends to mean that one can understand, identify, interpret, and communicate a variety of different types of information and data. Moreover, one who is literate may have the foundation necessary to create new information and thus expand the existing pool of human knowledge (UNESCO, 2019).

In today's fast-paced and increasingly digital world, basic literacy is a requirement for persevering. However, there are many adults and youths around the world who fail to acquire or deepen these skills at an early age. These persons can be excluded from their societies, barred from desired jobs, and may fail to enjoy the same opportunities afforded their more literate peers (UNESCO, 2019).

The initiative to make literacy a right that all can enjoy is, therefore, a crucial one for investing in our global community - and it's one that we can invest in from the immediacy of our own classrooms (UNESCO, 2019).

What is emergent - or early - literacy?

From the moment children are born, they begin to develop early literacy skills. Their parents or caregivers, in speaking to them, help the child recognize the patterns and cadences and routine sounds of speech. As the eyesite of children develop, they begin to be able to identify letters and shapes. These may seem simple, but they are important steps that will result in lifelong enjoyment and ease with basic literacy skills (University of South Florida, 2020).

For some children, formal literacy instruction begins with kindergarten or in pre-K. Early literacy instruction tends to include activities such as:

- Decoding, or working with sounds and letters

- Basic comprehension, or being able to understand stories and pieces of information

- Oral language skills, or the basics of sentence structure and a beginning vocabulary.

Some contend that pre-K should be more play-based or child-led, but many kindergarten courses are geared for children who already have basic literary skills. This means that children who begin kindergarten without picking up some of the foundations of literacy either at home or in a formal pre-K program will start school, on day one, behind their peers. The achievement gap may begin that early (University of South Florida, 2020).

Developmentally-appropriate literacy instruction should be an important part, therefore, of early parenthood (for example, reading books to children); the parents in an academic community should be given this information. However, not all parents have the time, energy, or ability to lay the groundwork for literacy. It's important, therefore, that schools - the institutions most directly responsible for a child's education - have systems in place to teach literacy skills, explicitly and continually, from the very first day that a child is first entrusted to its care (University of South Florida, 2020).

What are the literacy skills that are important to teach pre-K students in order to help them stay afloat when they reach elementary school?

The types of skills that children learn early in life will help them build lifelong skillsets. The primary groups of skills that pre-K teachers or parents need to focus on are decoding and language comprehension skills (University of South Florida, 2020).

- Decoding skills involve learning the letters in the alphabet; what they sound like; and even starting to figure out phonological concepts, such as rhyming and diction. These skills help children learn how to recognize letters - an important prerequisite to reading later in life. However, this is not the only skill required for reading - as reading involves more than simply recognizing and remembering discrete letters or even words.

- Language comprehension skills help connect those letters and words and bring the underlying meaning to life. With this skillset, children learn how to

understand what they read. Inference, comprehension, detection - children learn to do this by reading books, discussing them, answering questions, and reading more.

Both of these skills build upon each other and will result in additional benefits, such as the building of a more in-depth vocabulary. Later on, being able to read and comprehend well will enable students to take ownership of their own learning journies. These skills can be built through shared book-reading, small group activities, or phonological activities such as singing or playing games that involve sounds (University of South Florida, 2020).

The Benefits of Early Literacy

Developing literacy skills early on in a child's educational career (some might say before that career has well begun) has definite benefits for children. For example, it helps them build a larger vocabulary. It certainly allows a child to learn more subjects more quickly, as reading is still the primary vehicle by way of which education occurs (Port Discovery Public Relations, 2018).

There is even an argument that developing a love for reading and an appreciation for great literature helps drive the development of empathy in young children; for example, research has shown us that a person's capacity of relating to other people may be related in part to the types of books we are reading. This makes sense: The books we read certainly have an influence on the way we think, and if we read across a varied spectrum of literary traditions, our reading habits will expose us to a world of experiences and histories other than our own (Port Discovery Public Relations, 2018).

Reading can therefore help children harness the potential of a much more global mindset, curious worldview, and empathetic capacity for compassion. This, in turn, can inform children's actions when they grow to become members of society (Port Discovery Public Relations, 2018).

Reading and building a comprehensive toolkit of literacy and numeracy skills can also achieve the following aims:

- Helping children build a comprehensive vocabulary

- Assisting with pediatric brain development

- Setting children up for academic success

- Building nuanced multi-sensory development

- Increasing a child's quantitative reasoning skills

- Aiding with the formation of emotional awareness

This last point leads us to a larger discussion of the benefits that individual literacy confers on an entire community - as well as the deficits that an entire community must suffer as a result of low literacy outcomes (Port Discovery Public Relations, 2018).

Causes and Consequences of Low Literacy

If we are to work as a society to improve literacy in the early years, it's important to know two things: why it's worth fighting for, and what are the causes of low literacy so we can work to reverse those causes in the first place.

Some causes of low literacy are more difficult than others: for example, hearing or vision loss, undiagnosed learning disabilities, or the lack of a role model in the home of a low-literacy child - no one to stress the importance of regular reading. In addition, the typical causes of low literacy tend to go hand in hand with each other: A child living in poverty, for example, will likely have to overcome several barriers to achieving high levels of literacy (Literacy Pittsburgh, 2021).

The most common causes of low literacy, aside from those already mentioned, include:

- Regularly Missing School

- Moving from School to School

- Leaving School at a Young Age

- Being Forced to Learn English as a Second Language

The Consequences of Low Literacy for Individuals and Society

When fully realizing the comprehensive, lifelong effects that low literacy has on an individual, it becomes clear how much we as a society assume that literacy is a basic necessity; yet, our society often makes it difficult for entire communities of people to gain easy and consistent access to literacy-building skills. Unfortunately, this is a cycle of suffering: Individuals with low literacy tend to have a limited ability to pursue thriving lives as productive members of their communities, and communities with larger

populations of low-literate people have decreasing resources with which to tackle the problem (Literacy Pittsburgh, 2021).

Low literacy has the following significant effects on individuals, both for their daily lives and their entire future:

- **Increased Difficulty Obtaining and Retaining Information:** People who exhibit low literacy may have a harder time first getting access to and then understanding information that is essential to their lives

- **Increased Unemployment:** While it does fluctuate, the unemployment rate does stay persistently higher for those with less schooling than their peers

- **Fewer Job Opportunities:** When a person with low literacy is up for a job, a prospective employer might overlook that individual, preferring a candidate with more schooling or skills. In addition, persons of low literacy may even decline employment opportunities, because they lack confidence that they'll be able to navigate training, paperwork, and daily requirements.

- **Reduced Income:** As persons with low literacy may not have access to higher-paying jobs, they tend to work for less money. Low literacy is often associated with income levels that put families below the poverty line.

- **Reduced Likelihood that Progeny will Overcome Literacy Issues:** If a person with low literacy has children, the odds are high that those children will also experience literacy issues. This is known as the intergenerational transmission of low literacy.

- **Reduced Health:** Whether it's due to a lack of education, because jobs may require manual labor, or due to reduced access to healthcare initiatives, low literacy individuals tend to be victims of more workplace accidents, medication misuse, and even general illnesses than their more well-read peers (Literacy Pittsburgh, 2021).

Clearly, those individuals who suffer from low literacy are affected by its consequences; moreover, the society that contains a large percentage of low-literacy individuals is also impacted by low literacy. The following are effects of low literacy that an entire society may experience:

- Literacy is a prerequisite for both individuals and entire groups of people - even countries - to be competitive leaders in the world space; particularly as we move

forward through the information age. There are many leading positions in today's society that currently remain vacant because there is a lack of truly literate, deep-thinking personnel that can excel at these opportunities.

- Studies have shown that countries that have higher proportions of adults who suffer from low literacy have a much slower long-term growth rate for their GDP. This is another marker of a successful country on the world scale - one which can be directly influenced by the number of literate individuals in a country. This puts tremendous power in the hands of teachers and students; power which has, so far, not attracted investments or national interest.

- Literacy enables individuals to understand the nuanced issues which impact them - and increases the likelihood of getting involved in community affairs.

- Finally, as individuals who suffer from low literacy often have lower-paying jobs or face extended periods of unemployment, the cost to the average taxpayer to fund unemployment compensation or welfare payments remains high - and will continue to as long as the number of low-literate individuals in our nation continues to rise (Literacy Pittsburgh, 2021).

Barriers that Individuals with Low Literacy - Young and Old - Face

It may be easy for those who enjoy increased levels of literacy to wonder precisely why individuals who exhibit low literacy don't simply seek out basic training. Unfortunately, it's not that easy - and the longer a person remains illiterate or low-literate, the more difficult pursuing literacy will be. This is why improving early childhood education in terms of literacy is among the more important initiatives facing modern education (Literacy Pittsburgh, 2021).

Below, find a list of barriers to increased literacy that low-literate individuals face. Note that these barriers do not merely apply to adults; even children who arrive in elementary school with literacy skills behind those of their peers may experience many of these issues:

- Constraints from within their families

- Connections with past experiences at school that confer bad connotations

- Low self-esteem

- High levels of pessimism

- Lack of confidence in the actual benefits that literacy will confer on their lives

- Lack of money - familial or otherwise - or other resources that would aid the person to pursue literacy

- Schedule conflicts - for example, a job that might conflict with after-school tutoring

- Anxiety about any lessons offered or the very prospect of strengthening literacy skills

- Overly cautious attitude toward change

- Shame associated with their low literacy that impedes their way toward progress

While these are all barriers toward progress for individuals, they can be overcome. If we as a community begin to work hard to ensure that all communities have access to literacy training and that every individual has the support necessary to overcome these barriers, we may soon see the benefits of efforts promoting literacy. These benefits include:

- Giving persons from underprivileged backgrounds or upbringings the equal opportunity they need to achieve learning outcomes

- Ensuring that everyone has access to high-quality job opportunities with increased wages

- Generating more competitiveness for good jobs - which would drive innovation, hard work, and productivity

- Creating a more enthusiastic and dynamic workforce

- Enjoying a stronger economy due to the larger population of qualified, creative individuals

- Safeguarding jobs, resulting in higher retention levels

- Transferring literacy skills from generation to generation (Literacy Pittsburgh, 2021).

Section 1: Summary

When we think of literacy, it's easy to assume that it's a basic skill that everyone has the opportunity to enjoy equally. However, delving into the socio-economic benefits associated with literacy and the high barriers to literacy that many experience shows us that literacy is currently a privilege. Literacy formation requires concerted effort and nurturing - and some people (or entire communities of people) do not have the resources to make this happen.

While it can be tempting to ignore this problem as long as it does not affect us, the truth is that this is impossible. Poor literacy outcomes for any of our neighbors impact us all. We need to make sure that all people have access to literacy support, both for their own individual good and our collective good. Support for schools and increased guidelines for early childhood literacy instruction can be one way to even the playing field; however, schools need to make sure that they are teaching children in the correct way.

In the next section, we'll take a look at the scientific nuts and bolts of how children learn how to read. This will be crucial background information that will guide the way we approach helping children learn to read and obtain literacy skills more effectively.

Section 2: The Brain, Reading, and Current Research

When children learn to read, there are physiological changes that occur in their brains to further their learning progress - making it easier for them to obtain new information as they continue to grow. Children who have this training earlier on tend to do better later in life; children who do not have this systematic instruction and resultant crucial change in their brain's neurochemistry will likely not do as well.

In order to understand how best to support children as they learn to read, it's necessary to start with a good knowledge of how children integrate literacy skills into their neurological toolkit. Then, we'll be able to look at practices that best harness the benefit of those natural biological processes to support early childhood education in helping children meet their necessary literacy goals.

How the Brain Changes When Children Learn to Read

Previous strategies that have been taught in professional educational capacities have involved diagnostic activities that pinpoint a specific 'reading level' for each child, and simply giving children books that correspond to that specific reading level.

Accompanying this more simplistic approach were strategies that teachers were given to help children overcome reading hurdles by themselves (SA Reads, 2020).

For example, one strategy that teachers were taught in teaching preparatory programs to help students move past a word that they were 'stuck' on involved:

- Telling a child to look at a picture that accompanied the difficult word in question - e.g., an illustration on the page adjacent a confusing passage;

- Asking the students to stop reading, and think about what type of word would make sense in the context of the passage that they'd been reading;

- Informing the students that, armed with that nebulous idea of the potentially-correct sense of the passage, they should skip the difficult word and move on to the next paragraph

While there are benefits to this approach - having a sense as to how to guess the inherent meaning of difficult vocabulary in the wild is an important skill for adults in professional settings - it's not particularly conducive to helping children learn the nuts and bolts of reading. Some teachers who taught this process began to realize that simply surrounding students with great literature corresponding to their probable 'reading level' and helping them jump over difficult words was not a system that gave every child the support required for success (SA Reads, 2020).

In the past, teaching preparatory systems haven't really given teacher solutions to help support students who fall outside this simplistic system of literacy instruction. These teachers were told that struggling students just needed more time - or, perhaps, that these students had insufficient support at home (a problematic situation which teachers have been told to accept without the potential of improving) (SA Reads, 2020).

Today, with more information about how the human brain learns new information, modern teachers have better processes available to them by which to support their students (Bell, 2017).

In the past, teachers have been taught to equivocate the processes of learning to speak with learning to read. It's clear that there is a lot of overlap, but they are not the same processes. For example, learning to recognize, understand, and then speak the language in which they are immersed is a very natural, intuitive brain process for most very young children (SA Reads, 2020).

In the past, researchers and teachers have assumed that young children intuit the mechanisms of reading in a similar immersive way. This is known as the 'whole language' approach - one with which many of today's teachers may be familiar. This approach assumes that children can - intuitively - figure out how to decode symbols and letters and put them together to make words with enough exposure. A teacher's job was to focus on reading comprehension, not necessarily decoding instruction. In recent decades and among extremely recent studies, these assumptions and processes have been disproven (SA Reads, 2020).

Scientists have leveraged the recent leaps and bounds in the worlds of cognitive science to observe what's happening in the human brain while it's reading. Using fMRIs as well as other tools to figure out what's happening on a neurological level while a student is grasping the nuts and bolts of literacy, researchers have demonstrated that there are specific ways that teachers can empower their students to become readers - and better readers. In other words, it's not just something natural, that students should be left to grasp on their own. (The fact that some children do seem to learn how to read on their own is a phenomenon generally explicable through at-home exposure or similar practices) (SA Reads, 2020).

Reading is an extremely complex skill. It requires recognition of recurring symbols, decoding those symbols, and learning to ascribe specific mental meaning to the symbols that we recognize. This skill requires instruction on a similar level of careful complexity (SA Reads, 2020).

Next, let's discuss the ways by which humans learn how to make the connection between spoken language, print, and the meaning behind the sounds and symbols.

How Do Humans Learn to Translate Printed Letters to True Meaning?

"Writing is not language, but merely a way of recording language by visible marks." - Leonard Bloomfield, Linguist

In order to establish basic reading comprehension, we first need to have auditory comprehension - the foundational skill of hearing spoken languages and knowing what is meant. This involves first recognizing individual sounds, the phonic ingredients of auditory language, and then knowing how to stitch them together to create full words. We learn how to do this through exposure to a fleshed-out lingual system from a very young age (SA Reads, 2020).

Later, when we approach a system meant to teach us how to write and read, we have to take those words apart again. We have to convert the symbols that we see on pages to those sounds, to marry the two together into one linguistic code. Children who don't learn to grasp that concept - that the symbols they see on the page and the soundbites that they've been immersed in since before they can remember mean the same thing - are stuck with symbols on the page that remain just that: symbols. For children who have not connected the dots appropriately, letters remain circles and shapes and lines that have no attached meaning (SA Reads, 2020).

One of the first and most crucial lines that students need to draw is between the system of meaning they've built themselves and that they've connected to auditory language and a series of (at first, seemingly random) marks on a page. While some children may seem to be able to figure out this conversion process themselves, most need explicit instruction in order to be able to do this (SA Reads, 2020).

The reason for this is simple: While the brain can intuitively grasp that auditory language has a communicative meaning, symbols on a page do not have that same initial level of necessary value. As teachers, we have to help them build those neural pathways (SA Reads, 2020).

Studies have shown that some 40% of children may be able to make these connections themselves. This leaves the majority - some six of ten children - who require explicit instruction in the fundamentals of reading. Many current educational systems assume that some level of reading awareness - or at least that the initial ascription of meaning to written symbols - has been made by kindergarten. By sidestepping the need to instruct children as they make this connection, many educational systems assume that mere immersion in age-appropriate literature will result in good reading habits. This leaves 60% of the student population without access to the instruction necessary for their success; and, worse, they may not realize that they are the victim of a lack of support. These students may feel like they have missed something huge - which is true - and that it is their fault - which it is not (SA Reads, 2020).

When it comes to probing the crucial initial activities in the reading process, there are two main categories of instruction that a young child needs to incorporate. These include the process of decoding words and the process of comprehending text. These are separate processes that are often lumped into one instructional category. Conversely, some teachers have learned reading instruction strategies that involve simply decoding or comprehending techniques - not both. Teachers need to know how

to teach both decoding and comprehending techniques to young children (SA Reads, 2020).

First, a child must learn how to identify words through the process of decoding. This skill is related to children's ability to make the link between the speech systems they're familiar with and the unfamiliar symbols on the page (SA Reads, 2020).

Secondly, a child must learn how to ascribe meaning to the words they read. This skill is related to children's existing vocabulary as well as their contextual knowledge of the world around them.

It's clear just from this breakdown that learning to read is a gargantuan - and holistic - task. Children need our support from a young age in order to make this happen. These two separate and crucial skills - decoding and comprehension - are necessary for both literacy and numeracy growth; therefore, it is necessary that teachers learn to treat these as separate (yet symbiotic) skillsets that children must learn (SA Reads, 2020).

The Difficulty of Learning How to Read

The true difficulty of reading and reading well escapes many of us - adults, who have incorporated reading so innately and subconsciously that understanding written texts no longer requires any real thought or effort. After a while, reading is automatic. Not reading - or decoding and comprehending - text when we see it is impossible (Bell, 2017).

It's easy to see how we might think that reading is hard-wired into us. It's hard to remember that - while humans have been using oral language techniques for over 60,000 years (according to some estimations), we've only been reading and writing for a very small percentage of that time (some 5,000 years). Our species does not have the predisposition to naturally integrate these types of literacy skills as we do verbal ones. We have to forge those connections ourselves. This takes years of practice and the right type of instruction to do successfully, and it is not an easy process (Bell, 2017).

The human brain is a constantly-changing organ. Any time that we learn anything new or start to lay the groundwork for a new skill, the neurons - or specific brain cells - in our brain start to build connections. Each time we repeat that new skill, the connection between those neurons grows stronger. The ability to grow these neuronal connections and create new bridges between far-flung neurons in our brains is much easier when we are young; we have a type of flexibility and facility in the makeup of our brains in those early years that makes this type of learning easy (Bell, 2017).

As a child starts to make the connection between speech meaning and symbol meaning, neurons begin to form connections in the brain. Each time a child strengthens those meanings, the neuronal connections are strengthened. The good thing is that children do not have to build this neuronal architecture from scratch. After all, most children who are beginning the journey of learning how to read already have some verbal language familiarity. Reading will become, for them, a way of accessing the meaning of language by sight, rather than by sound. This means that a child can build onto existing frameworks in their brain when learning how to read, instead of building something completely new (Bell, 2017).

Of course, in order to take this efficient and strategic approach to learning, a child must have access to the right type of instruction. We cannot expect children to figure this out on their own (Bell, 2017).

How information makes it from the printed page to our comprehension

Let's think about what happens when someone who is comfortable with reading encounters a word. Again, now, the sublimation of the coded information happens so quickly that we don't think about it - but these steps are not innate to someone who is just learning to read (Bell, 2017).

First sighting a word causes the basic information of that symbol from the eye to the occipital lobe, a part of the brain at the very back of our heads. There, the **occipital lobe** (the part of the brain that processes visual stimuli) works to make sense of that word in the same way that we should work to make sense of a stop sign or a friendly face (Bell, 2017).

After the occipital lobe has determined that a word is a type of visual stimuli that has to do with 'communication' or 'language,' the information accompanying that word travels to a part of your brain known as the **left fusiform gyrus**. Informally, among scientists and researchers, this part of the brain is known as the '**letterbox**.' This is where your brain sorts the lines and shapes that make up letters into the idea that accompanies a word (Bell, 2017).

The letterbox is important to note because it's not something that humans have naturally. Illiterate adults do not have it. Very young children do not have it. It's only generated or developed if a student learns how to read properly. As students learn how to read more and more (and their vocabulary grows, as a result), their letterboxes grows as well. It expands to store millions of different letters and words as their own distinct symbols. (This helps us later in life by aiding with the instant, seamless recognition of

words even when they're typed in strange fonts or in hard-to-read handwriting) (Bell, 2017).

Once the letterbox has stored or pinpointed the specific word, the information accompanying that word travels from a human's letterbox to the **temporal and frontal lobes of our brains**. These parts of our brains help us connect meaning that we have already understood to the new word - and help us figure out how to pronounce a written word, so we can connect a written symbol to a spoken sound with ease. Scientists have watched the frontal and temporal lobes of our brain light up when we hear a word. To put it succinctly, these lobes of our brain are where language and communication happen; the processing that happens beforehand (e.g., the letterbox) is the part that students need to grow in order to ground their literacy journey (Bell, 2017).

This may seem like a lot of traveling that one discrete piece of literary information - one word - has to undergo to make it from the page to our comprehension. Perhaps this will make the difficulty and slowness with which very young children go about reading make more sense. However, as proficient readers and writers - the literate - are aware, all of this informational traveling and processing becomes subconscious with enough practicing. The time it takes for information to go from word to brain is under half a second (Bell, 2017).

It's clear, though, that in order for children to grasp this complex process effectively and efficiently, it's going to take systemic and strategic instruction. How can school systems work to better support children as they construct these neuronal pathways - the bedrock of their future literacy journey (Bell, 2017)?

Here's a quick recap of what we've learned about the growing brain, along with some ideas about how literacy instruction can make the most of meeting children where they already are:

- For children who haven't learned how to do it yet, the (to us, instinctive) process of understanding the connection between print and communication and decoding that print is laborious and confusing.

- To help children grow in literacy, we need to help them make that connection, and then we need to help them practice that connection until it becomes innate.

- Then, to help children's literacy improve, we need to help them build up a large store of familiar words and sounds in their brain - in their newly-formed letterbox

- that they can recognize, instantly, instead of having to puzzle and parse and sound out each syllable, every single time.

- Literacy instruction can best help a child make those architectural connections in their brain by drawing constant attention to the unique relationship between printed letters - the circles and shapes and lines that make up written communication - and the speech-sounds that they already connect to communication. This will help them build off their brain's existing framework, instead of forcing them to reinvent their neurological wheels.

- One efficient method of doing just this is prioritizing early phonics work with children - particularly, children who might not have had the luck or fortune of working with their parents to build their literacy from infancy. Phonics work can help jumpstart that crucial connection. After the first neurological bridge is made, it gets easier - so helping children build that first bridge is key (Bell, 2017).

What does science tell us about the future of efficient literacy development for children?

The best way for teachers to support students struggling with literacy is to look very closely at the latest science delving into the way children effectively learn. Because pediatric neurological research is a very hot topic right now, it stands to reason that the next decade may hold within it huge advances in what we know about the brain development of young children - and, because of this, great potential for helping children grow in their all-important literacy skills (Bell, 2017).

Technology will be a huge help in the future. Changing technology will also change what it means to be 'literate.' In the future, for example, it might be just as essential to learn media communications skills or web-based coding skills in order to communicate effectively. It's important for us to keep our minds open and allow our literacy development priorities to change along with the avenues of communication that are open for us (Bell, 2017).

Notably, today's students will be the ones who - when grown - make many of the decisions regarding the communication patterns of our descendants. Giving them the tools now to understand effective communication will not only change their lives but also set them up to improve communication and literacy efforts for the next chapter of human history (Bell, 2017).

What does research (e.g., brain imaging) tell us about students who struggle to read or write well?

If young students have the brain plasticity to knit together crucial neuronal connections at a much quicker and easier rate than an adult might be able to, what is happening in the brains of children who naturally struggle with reading and writing concepts?

Scientists have looked into this question at great length. A review of the brain scans of readers who are struggling with their literacy development shows very different activity patterns from the brain scans of strong, established readers. Some of the notable differences include:

- Children struggling with literacy might exhibit brain scans that show that their pathways for communication, language and the connection of meaning with symbols are not as established as those of a stronger reader of a similar age. Because these pathways are not as clear-cut and strong, children will have to start from the beginning (or from a less practiced place) every time they set out to accomplish a literacy goal.

- Children with named learning disabilities - for example, dyslexia - may exhibit symptoms of brains that have developed in a way that does not make the efficient building of neuronal connections that support reading easy. The brain images of dyslexic children have shown that there is a neurological cause for the mechanizations of their disorder. For example, readers who are dyslexic tend to show under-activation in the areas of their brain that are associated with functions in which they are weaker - and over-activation in areas of their brain that they use more, in order to compensate. Some dyslexics underuse the parts of their brain that are designed to process language efficiently, such as the left hemisphere, and instead use the right hemisphere - which can get the job done but isn't quite as efficient.

- Researchers have found that children who are naturally good decoders (or are more practiced at it) tend to exhibit more brain activation in the areas that help support reading in the more-efficient left hemisphere.

- Additionally, many persons with dyslexia or who have other disabilities that interfere with swift literacy and numeracy development tend to have a lot of brain activity in their lower frontal regions of the brain. This may be due to the

fact that the lower frontal regions of the brain tend to be associated with compensatory activities (Sedita, 2020).

Is it possible to 'rewire' the growing brain through strategic literacy instruction?

You may wonder: If the brain is a series of neuronal connections, and reading development depends on the right connections being made at the right time: Can a teacher help studenta with literacy issues gently reroute their brain's architecture to make their reading and writing efforts more efficient (Sedita, 2020)?

In other words: Young children have high levels of brain plasticity. Can teachers use effective instruction to harness that plasticity to reduce dyslexic activity - as well as other types of disorders (Sedita, 2020)?

There's good news to share, here: Researchers have found that persons with dyslexia can actually rewire their brains - and similar results have happened for students who struggle with literacy development for other reasons. However, the students who have difficulties in these areas need to encounter extremely meaningful modes of instruction that teach the awareness of recurring phonological sounds, the ways to decode the symbols that make up common words, and the ways to connect those two pieces of information (Sedita, 2020).

Researchers have also found, through years of observation watching young learners rewire their brains, that there are two variables which - above, perhaps, many others - contribute most directly to strengthening the neural pathways which eventually transform struggling readers into strong ones. These two variables are:

- Constant practice. More than that: Students' practice of their burgeoning literacy skills needs to be deliberate. In order to grow nascent literacy skills, students need to surround themselves with as many different types of sounds and written words as is possible.

- Strategic instruction. Mere exposure to increasingly difficult texts won't do much for children - they have to be prepared with the tools required to decode and comprehend them. The level of intensity that struggling students will need to increase their literacy skills may be high, but it'll be worth it as they master fluency, use of a larger vocabulary, and the type of instant, subconscious recognition of decoded words and their meaning that renders a literacy journey easy instead of arduous.

The benefit of all of this hard work can be deeply profound (Sedita, 2020).

At the conclusion of their studies, the researchers who conducted these large-scale observations found that when students who struggle receive this type of targeted support - and they practice persistently and well - resultant brain imaging shows that their brains have generated the architecture that was not there before. New neuronal pathways have formed that connect the parts of the brain that manage language processing with the parts of the brain that manage visual processing (Sedita, 2020).

A Map of the Parts of the Brain that are Crucial to a Reading Journey

As teachers learn to better support the students who most need their care, it's crucial to remember that students who struggle aren't the lazy ones, the ones that don't care, or that aren't trying as hard as their peers. There's a very good chance that they have not had the chance to build their brains up - physically - in a way that would be most conducive to assisting their literacy and numeracy progress (EAB, 2019).

Grounding our perception of what it takes to read and write successfully in scientific facts about the parts of our brains that have to work in precise ways can enable us to more efficiently help our students succeed (EAB, 2019).

Whether we need to read a sentence or a paragraph, these are the parts of our brains that are making the magic happen:

- **The Visual Cortex:** This is the part of the brain that helps manage how our eyes respond to external stimuli. It also organizes the overwhelming spectrum of images and information that our eyes take in - filtering out what is important and what we can (literally) overlook when it comes to sending more information deeper into our brains. When we see written words and letters, the visual cortex is the first part of our brain that handles the reading and comprehension response.

- **The Angular Gyrus:** This part of the brain helps us form the crucial connections between sounds and the written letters we see on the page. It also lights up particularly well when we read words aloud, to ourselves or to others - suggesting, perhaps, that one way to jumpstart learning habits primed to build toward literacy success is to have students read aloud as often as possible, thereby cementing multiple skills at the same time.

- **The Auditory Cortex:** Just as the visual cortex acts as a gateway for visual stimuli, the auditory cortex partners with your ears to manage the type of information you hear rather than see. This part of your brain helps you discern the difference between the varying sounds that make up spoken languages - a crucial component of learning to understand what people say so you can communicate effectively.

- **The Inferior Frontal Gyrus:** As we've mentioned previously, this section of the brain helps us create the part of communication that comes from us: sensible speech patterns and sounds, and, ultimately, sentences and words that are logical and intelligible.

These parts of our brain - as well as others, more indirectly - help our brains understand the world around us. When they encounter written speech, they go through a decoding process that helps translate symbols on a page to meaning that we can use and respond to (EAB, 2019).

What Is the Process of 'Decoding'?

Several times thus far we've mentioned an integral step in the reading and writing process - 'decoding.' This may not sound like something we do on a routine basis over the course of our lives. This is because, by adulthood, many of us have learned to read so effectively that we no longer think of each individual step (EAB, 2019).

This can, in turn, make it very difficult to help kindergarteners figure out the importance of decoding as well as how to do it well and consistently. As teachers, we need to be equipped to pass on the following decoding skills to our students, and it's important to realize that each of these skills will require dedicated practice until our students have them fully integrated as habits. According to some, at least half of the time allocated to reading or writing instruction in kindergarten through second grade should be focused on decoding practice (EAB, 2019).

Only after students can decode properly should we move on to exposing them to literature and comprehension techniques. Decoding comes first; it's the gateway to heightened literacy (EAB, 2019).

The four subsets of decoding skills are as follows:

- **Phonological Awareness:** In order to be able to read well, we need to start by being able to recognize all of the auditory soundbites that make up the English

language. Here, we are at a bit of a disadvantage; English has more of these different types of speech sounds than other languages. Students must learn to recognize the 44 different sounds that make up English speech as they learn how to read.

- **Print Concepts:** Recognizing the sounds that make up English is far from the only recognition drill that your students will have to undertake. Part of reading (and, later, writing) also involves recognition of the 26 letters that make up the English alphabet. We also need to teach children how to recognize the simple makeup of different types of communications: the chapters that make up a book, the salutations and sign-offs that make up emails and letters, and the way that text often accompanies pictures for books geared toward children. Helping your children familiarize themselves with the nuances of printed English such as punctuation marks, capital letters, lowercase letters, and the left-to-right flow of most books they will encounter will also set them up for success.

- **Phonics and Word Recognition:** After we have learned to recognize the sounds and sights that make up English communication, we can start to put those different pieces together into words and sentences. Students learn phonics, and then their teachers help them to stitch discrete sounds together by sounding out words. After a while, we start to recognize common words - which allows us to skip the difficult sounding-out processes.

- **Fluency:** After a student has learned about discrete sounds, specific letters, and the words that come together as a result, students can start to connect what they've learned by reading sentences and books. This is when exposure starts to come in handy - but systematized phonics and recognition drills need to continue until well after students feel very comfortable sounding out words on their own. Literacy is often not a linear process, and students need to receive all the support they need until, very simply, they don't need it anymore - and then they will require a different type of support, in the form of exercises that force their comfortability with literacy to grow (e.g., more challenging books, different types of reading and writing projects, and similar formative opportunities) (EAB, 2019).

How Does the Brain Learn to Count?

Thus far, we've been entirely focused on the way that the brain grows and responds when faced with the prospect of learning to read. This constitutes a large part of a student's early literacy journey. Numeracy - or familiarity with numbers - is not strictly

part of literacy, but it is a related skill that children need to develop in order to be able to move through their studies. As this is the case, we'd like to spend just a few minutes discussing the way that children learn how to count (Ged, 2021).

Learning how to count is one of the first things that a child learns how to do; some infants even demonstrate some level of awareness of the concept of increasing numbers before they're able to speak. However, it's not something that we should take for granted. For one thing, if we *don't* take it for granted and instead assume that there's a way that we can help children generate and increase this skill, we will be in a better place to help children who struggle with this and other foundational mathematics topics (Ged, 2021).

Our Brains and Early Mathematical Concepts: How We Respond

We've been able to theorize that the human brain has evolved to understand letters and words and communication quite easily. There are neuropsychologists that suggest that, similarly, we're also born with a sense of *number* in our brains, a hard-wired sense of *quantity*. Just as there is an integral place of our brains that helps us understand communication (the 'letterbox'), there are some psychologists that suggest that there is a similar section of the brain (a small part near the left ear) that is in charge of our response to numbers. One such psychologist has referred to this part of our brains as the 'number module' (Ged, 2021).

The number module of the brain helps us perceive the 'count' of a group of objects - for example, if our visual cortex sends an image of three apples to our number module, the number module is the part of the brain that understands and registers the three-ness of that information (Ged, 2021).

To this extent, and according to this theory, most children do have some type of awareness of counting very early in life. However, any further use of the basic skill of 'counting' and certainly any later manipulation of numbers and mathematical concepts - even just variations on counting like addition and subtraction - are likely not skills that are similarly hard-wired in our brains. We have to learn how to do that (Ged, 2021).

Setting Children Up for Mathematical Success

Scientists have completed extensive studies on the way that young children achieve mathematical familiarity. Their work shows that very young children (as young as one year old) do have some sense of numeracy - for example, the idea that there are more objects in a set of three items versus a set of two items. This follows nicely from the

theories that the psychologists we mentioned above have generated regarding our built-in number modules (Ged, 2021).

At some point, early in the mathematical journey, young children connect *quantity* as a type of quality that can be attributed to their surroundings and to their growing familiarity with the English language. This is where it becomes clear that numeracy is, ultimately, a type of literacy. One of the first verbal concepts that toddlers learn is counting; making different sounds that correspond to that innate sense of quantity that we all have (Ged, 2021).

Responding, perhaps, to this sense of primacy regarding literacy and numeracy, parents do tend to count with their children. Counting their blocks and their fingers and toes is a very natural instinct that many parents have while playing with their children. After a while, children learn to chime in and count along, as well - opening the door for growth down their numeracy journey later in life (Ged, 2021).

The Early Milestones of Childhood Numeracy

The various stages that children go through in order to learn how to count effectively are as follows:

- First, a child will be able to recognize the number of objects there are in a small set without having to go through the mechanics of counting. For example, in order to be aware that there are three apples sitting before them, a child doesn't have to point to each individual apple and register the concepts of one - two - three. They just know, visually, that that group has three apples in it. (This is similar to recognizing a simple word like 'the' without having to sound out each phonological concept.)

- Then, children will exhibit familiarity with the basic 'number words' (one, two, three, etc). They will be able to recite these words in order, and they will be able to associate these words with groups of objects of the correct quantity. This familiarity will extend to low-level puzzles or manipulations of the normal number sequence, such as, for instance, asking children to start counting at a number other than one.

- After this, your children will be able to recognize that the number of objects in a group will stay the same unless they take action (or another does) to change that number. Six apples, for instance, will always be six apples, even if you move those

apples around or group them differently. This concept is referred to as the *conservation of quantity*.

- Then, children will begin to understand that they can count objects that aren't necessarily visible; for example, sounds, or ideas, or family members who are not present in the room.

- Finally, one of the last early childhood milestones in terms of numeracy comes with the awareness of cardinality, or the idea that the last number that a child counts represents the sum total of objects in a set. For example, if you ask children to count four apples, and they count to *one, two, three, four*, and then you ask them how many apples there are, they should be able to know that the answer is four without having to count again (Ged, 2021).

Next Steps: Helping a Child Move from Counting to Further Numeracy Goals

While counting in and of itself represents a huge milestone in children's numeracy journey, their progress can't end there. Next, a child needs to learn how to add. Here are a few of the stages that a child might move through as they build toward this competency:

- Counting each set of objects. If you give your students three apples and five oranges before asking them to give you the sum total of all of the fruit they see, they will tend to count to three for the apples, five for the oranges, and then from one to eight to add three plus five. This is not the most efficient way to go about the addition process, but it is a good step on the journey toward mastery of basic numeracy skills.

- Counting up from the lower number. With this slightly heightened familiarity of the relationship between quantities of subsets, a child will start with the knowledge that there are three apples, and count up from three to add the number of oranges.

- Counting up from the higher number. Of course, it's slightly more efficient to start from the higher number, but this can feel a little risky - so it usually comes a little later in a child's numeracy journey. In this example, a child would start with the knowledge that there are five oranges, and count up from there to add on the three apples.

- In the final stage of initial familiarity with adding up small sums of visual quantities, young children will be able to tell simply by looking that there are three apples and five oranges - and will be able to remember the fact that three plus five is eight. Number lines can be a good way to help children visually connect these dots (Ged, 2021).

Moving Beyond Simple Addition to Increase Numeracy

After young students are familiar with counting and simple addition, they will be able to move toward slightly more complex processes, such as counting backward (which lays the groundwork for subtraction) and counting in groups - by twos, by fives, by tens - which sets the stage for multiplication (Ged, 2021).

The next larger concept that children will have to understand to progress toward numeracy mastery is the concept of place value. This makes comprehension of larger numbers much easier, but it is a more complicated subject to grasp. However, having a basic knowledge of the earlier concepts of counting, addition, and basic number manipulation will help young students more easily understand when teachers move on to more advanced and complex topics (Ged, 2021).

Section 2: Summary

The building blocks for numeracy and literacy both come from consistent practice, constant exposure, and systematic and strategic instruction to meet children where they are. It's important to remember that many of the systems that we take for granted as literate adults are actually very difficult processes that are made up of several complex steps and strategies. In order to teach these processes effectively, we need to start small. We need to help children make the crucial connections between symbols and meaning themselves, and to build off the communication basics they may already have, in order to help them build the brain architecture they need to succeed.

This understanding also provides the groundwork for assisting children who may struggle with grasping these basic subjects. Targeted support can work wonders for children who need our help the most - but it all starts with knowing precisely how best to help them.

Next, we'll discuss the ways that schools can work to establish literacy frameworks and milestones on a whole-school level, so as to best help the most children in the most efficient way possible in their beginning numeracy and literacy journeys.

Section 3: The Practical Implementation of Whole-School Approaches to Improving Literacy

In order for teachers to take on the challenge of improving literacy in children from a young age, it is necessary for the entire learning community to be involved. While individual teachers can make a world of difference for individual students, the change that the world needs in order to enjoy the benefits of improved literacy *en masse* requires a more organized, concerted effort. Therefore, in this final section, we will consider strategies that entire school communities can take in order to prioritize student literacy initiatives, particularly for those students who arrive at school for the first time with any traumas, learning disorders, or experiences that may make it more difficult for them to keep up with their peers.

The benefits of literacy at the whole-school level are profound. Schools that promote literacy at every grade level tend to be classed as 'high-performing', which (as a label) can attract funding, more studious applicants, and can result in more successful outcomes for each student (Peter Underwood Centre, 2020).

In fact, a whole-school approach to literacy all likely result in the following benefits:

1. When a whole school clearly values literacy and takes concrete steps to ensure that all students have access to tools that will help them pursue literacy, that school is truly embracing a strategy that will help each individual student succeed —including any student who may have reasons to struggle with literacy.

2. If literacy is promoted and pursued for every student at a school, that school will likely go on to produce classes of students who are capable and knowledgeable— students best poised to go on and be productive, empathetic, and skilled members of society.

3. As literacy presents an easy approach to learning about different cultures and integrating worldviews that may differ from one's own, it's also to be expected that a whole-school approach to literacy will result in a better understanding of the world as a global community. Students who grow up with this approach to literacy and the global community will be more empathetic and more interested in helping those around them, even those they do not personally know.

4. A school that realizes that it could do better in terms of assisting students to achieve literacy outcomes, strategizes holistic and practical ways to do so, and

then works toward and succeeds in those ends will also gain another worthy end: That school community will gain a culture of hard work and improvement—something that, in itself, can be hugely motivating for any student who arrives at school needing a little help (Peter Underwood Centre, 2020).

There are three common characteristics that are generally found in schools that take a comprehensive, holistic approach to improving literacy both at an early age and throughout an elementary student's early experiences. These three characteristics include:

- **Strategic Structures to Promote Occasions for Enjoying Literary Pursuits:** Schools that value literacy tend to devote time for nurturing it . Studies show that schools that promote literacy will typically have blocks scheduled into their regular days for students to learn literacy. These learning opportunities may consist of workshops, library exploration times, student-led literacy initiatives, or presentations by school staff.

- **Resources Shared to Make Literacy Easy:** Schools that have higher literacy metrics also have considerable libraries or other reading and writing resources. These libraries or literacy collections are developed collaboratively - instead of simply purchased by one person; they are accessible to every member of the learning community, and students and staff alike are expected to use these resources for school research as well as personal entertainment.

- **A School Culture that Values Literacy:** Finally, aside from sourcing or setting aside the time to enjoy literary pursuits as well as the resources to do so easily, a school culture that tends to accompany highly literate students will value a collegial, collaborative atmosphere. Students enjoy speaking with each other about literary topics; teachers and students alike are familiar with each other, because they have worked on similar project teams or contributed to the school atmosphere while working side by side. An atmosphere of creativity both inside and outside the classroom can work wonders for students' literacy - and it requires support from the entire school in order to make this happen (Peter Underwood Centre, 2020).

Just as sailing a ship safely and successfully requires action from every single crew member aboard, brainstorming, implementing, and maintaining a whole-school approach to literacy will take time and effort from every member of a learning community. If you are currently trying to figure out how to begin this type of trend at

your academic organization, a good place to start is by securing buy-in from the members of your school—at first, staff, but then from each of the students as well (Peter Underwood Centre, 2020).

If you're interested in finding ways to get stakeholders, staff, and even students on board with a literacy initiative, here are some things to keep in mind:

- You'll need to shift your mindset - and your entire school's mindset - from an individual to a communal one. Many of us have ingrained competitive streaks that lead us to believe success, even success with basic and near-required life skills is a zero-sum game. Eradicating that way of thinking is the first required step to getting people on board to help you help everyone succeed. More simply put: You'll have to support the people around you as they slowly adopt a 'we' mindset, after years of likely harboring an 'I' one.

- It's a good idea to think of embracing change from the bottom up. In other words, teachers must realize that students and student-led organizations and initiatives have the most power to help their peers; secondly, school leaders and administrators must acknowledge that teaching staff can be the primary drivers of change and support for struggling students, after those students' peers; and so on. The administration of a school must be prepared to invest the most in the smallest members of their school in order to see change - which will promote shared ownership of this literary challenge across the entire school.

After everyone at your school is aware of the investments that will be required from each member of your academic community, it will be time to get to work. Without opposition from any members of your school, school leaders, teachers, and students alike will be able to work toward improved literacy outcomes for the student body. The first wave of improvements should be geared toward two key aspects that may seem contradictory: Consistency and flexibility. Here's how each of those aspects is important when promoting literacy for your students:

1. **Consistency.** The only way to fully integrate a skill is to practice it, often, to the point when it's completely innate. This comes from routine repetition and use of literacy skills, both at a general level and through specific drills and practice. One way to implement this at a full-school level is to promote activities and conversation that depend upon a shared understanding of literary techniques and literacy skills so that every time one student stops to talk to another in a hallway, they're helping each other grow in literacy. Your school can create structures to

help all students with their consistent literary growth in this way. To start, all members of your school staff need to buy-in and agree to promote the same literacy learning intentions, the same markers of success that drive them, and the same types of assessing practices. This will create a uniform experience for the students growing in literacy that will help them grow together. Importantly, this will require staff and students to agree upon a few things - for example, the literary skills that are deemed high-priority, the specific vernacular and terminology that are used, and the literature and other tools that teachers use to drive home literary skills. Think about it: If students are struggling with literacy and then find that students in other classes are using an entirely different vocabulary and framework to solve similar problems, that only makes obtaining literacy look even more unwieldy and out-of-reach for a struggling student. It's far better to start from day one with agreed-upon standards and strategies across your school system, both for efficiency's sake and for the experience of each of your students.

2. **Flexibility**. Without undermining the importance of the previous point, it's also extremely important for teachers to be able to cater the learning experience to each struggling student. Just because a learning approach across a large community remains consistent does not mean that it is scripted, or that everything is mandated. Teaching is an art, and - as teachers know - following rigid, concrete rules rarely works when dealing with real human students. Teachers need to find the practical, productive, and empathetic middle ground between embracing consistency in literacy education for the good of their students and using their own skills and styles as teachers to help each of their students grow. It's likely a good idea to establish an ongoing conversation among teachers to share practices that seem to be working, to brainstorm ways to support students creatively and to find solutions that balance consistency and flexibility as teachers work to teach effectively and well (Peter Underwood Centre, 2020).

Finally, after a school has realized that a whole-school approach to literacy is needed, assigned systemic responsibility, and strategized implementation of literacy education to promote both consistency and flexibility, the final step is to commit to the process for as long as needed. Change, particularly positive change in education, takes a very long time to play out. Your school may need to implement literacy education strategies with the knowledge that it may take years to see any concrete results. After all, a full-scale organizational change promoting incremental growth for a large number of students will

undoubtedly be an ongoing, slow, and complex process. Your entire school community will need to realize this and go into this initiative with optimism and a commitment to an ongoing effort. Here are a few factors to consider regarding the process of long-term change and literary efforts at your school:

1. First, it's important to recognize and realize that starting and sustaining a whole-school approach to literacy is a *means* to an end, and is not the end goal itself. If you spend a lot of time, effort, and money launching a literacy program at your school but do not, after an appropriate period of time and assessment, notice that it is working for your students, you'll need to have an open mind about the process and be able to reconsider your strategies. This also means that your school will need to commit to this literacy program as a new, permanent, and ongoing initiative - not simply an addition to your education offerings to be checked off your school's to-do list once it's implemented.

2. On a similar note, implementing a whole-school approach to literacy requires being okay with the fact that this initiative will always represent a work in progress for you and your school. There will always be more to do, or something that you can do to improve on the measures you're installing - and that's okay! However, it will require your knowing this as you go in. As a result, it's a good idea if you establish - in the written policies or documents you draft to implement these policies - that every once in a while (yearly, quarterly) the leadership team of this initiative meets to review how the initiative is going. That way, everyone who has bought in or supports this initiative can also have a reasonable amount of certainty that this initiative is going as is hoped (Peter Underwood Centre, 2020).

Practical Ways for Your Entire School to Promote Early (and Ongoing) Literacy

Now that we've discussed the necessity of getting your entire school's administration on board with literacy efforts as well as the importance of committing to long-term efforts and hard work toward change, we'd like to follow that up with a few practical pointers for programs, initiatives, and small practices that your school can embrace. Choosing even a few of these strategies and cementing them into your school's culture can make a difference in your students' lives (Tyson, 2020):

1. Firstly, be open about your school's goals regarding literacy. Establishing them, reiterating them, and opening avenues for communication regarding how you're

working to meet them is crucial for any progress you'd like to see for your students.

2. Choosing goals that are very specific and achievable is key as well: For example, instead of working to a general sense of improved reading at your school, decide that your school will work toward 80% of students achieving a certain level of reading proficiency at the start of third grade. Then, you'll be able to put specific practices in gear to make sure that concrete goals are achieved.

3. Make sure that your school's literacy curriculum is rigorous, developed to help your teachers and students meet the defined goals that you've come up with, and is multifaceted. Different children learn in different ways, so your literacy curriculum should be geared to reach children where they currently are. You should also make sure that your school's approach to literacy covers all of the different facts of literacy - for example, your school's literacy initiatives should include targeted phonics training and reading comprehension efforts, as well as exposure to different types of literature.

4. As mentioned above, write check-in points to your school's literacy initiatives. In order to accomplish any goal, it's important that you have specific systems in place to do so. Providing ongoing times at which your school can assess its own progress and reach out for more support if necessary will increase the likelihood that your initiative will be successful.

5. If possible, team up with schools across your district to assess and manage your literacy approach. Not only does this take a community-centric tack that will help your school and students learn the benefit of global literacy in action, but it will allow you to leverage talent and experience in a helpful way. Creating some sort of district-wide literacy leadership board and sharing resources will help every member of your community.

6. Make sure that your school realizes the importance of professional development for teaching staff. Newer teaching methods may be imbued with the latest research in terms of helping children acquire literacy skills. Teachers who have been working for a long time may not have these skills. Even recently-educated teachers will need to take time, every once in a while to review the constantly-updated data in the fields of pediatric brain development and effective early childhood education. For example, think about it: Do all of the educators at your school understand the science behind how children's brains learn how to read

effectively? While delving into the subject matter this thoroughly may seem like overkill to some, it increases an educator's capacity and will be reflected in the way that all students are supported.

7. Take inventory of your school environment - and do so, constantly. It isn't just the direct literacy efforts your school makes that will enable students to learn effectively. You need to invest in social-emotional learning techniques for your students, as well as ensuring that your school climate is conducive for positive, safe learning experiences for your entire student body.

8. Implement a universal screening procedure for students in younger grades. This will help you catch and identify any students who may have reading or literacy issues - which, in turn, will help you provide targeted support where it is most needed. The early years, as we discussed above, are the most critical for establishing early reading and literacy foundations - so being able to diagnose issues early is critical for later success for any affected students.

9. Create social and community events that nourish a positive culture of literacy for the school and surrounding communities. Not all literacy efforts have to be in the classroom or found on a student's homework list. Some examples of these types of events may include having a public book of the month, hosting reading challenges with attractive prizes, or having a book fair at your school.

10. Establish a tiered set of literacy interventions for students at your schools who need help. It's not enough just to identify students that need help and send them to a tutor for one-on-one instruction. It's much more efficient for your entire school (or school district) to have accessible solutions that you can employ for all of your students who may need additional support at the same time. It's also a good idea to have a tiered approach, so you can escalate your strategies in a logical way if need be. For example, an idea of a Tier One strategy for a group of students who are reading behind their peers could involve an invitation to a small group book club that practices reading comprehension techniques. A Tier Two strategy could involve daily sessions that are individualized to each student.

11. Generate a list of support measures that parents can use to promote literacy efforts at home. As we discussed above, not every parent has the availability, expertise, or bandwidth to do so; however, schools can remove one potential roadblock (ignorance of support strategies) from the parents' paths to helping their children grow. This list should be very simple, and it can include links to

YouTube videos that parents can watch with their children to practice phonic skills, simple reading drills that parents can help their children with, and questions that parents can ask their children over dinner with regards to their recent reading habits.

12. Run routine family surveys to learn more about how your school can support reading at home. Simply asking parents, particularly parents who may have fewer resources and less time, how your school can help their child may provide a clear path to doing so in an efficient and effective way.

13. Invest in ensuring that every classroom, K-12, is a literacy-rich environment. This tends to be the focus for younger classrooms but may not be as important for older student's classrooms or for classrooms with a niche academic focus. Each classroom, regardless of its specific use, should have decorations and resources that are beautiful, inviting, and give students an access point to go deeper into literacy surrounding that subject in a variety of ways.

14. Make sure that your school's library is as high-quality as possible. There's a certain stereotype of school libraries - e.g., that they're often associated with dust, and perhaps used as a last-resort research resource or possibly just a location to study (particularly in today's Internet-based world). Your school's library should be an inviting place that's well-designed. When students have school libraries that they actually want to be in, those students interact more with books. In addition, you should ensure that your school's library is more than just the place where you keep reading materials; there are ways to design your library to support literacy initiatives across a wide variety of media. Allocate some of your school's budget toward improving the quality of your library, and you should see results shortly thereafter.

15. Organize a campaign that portrays each teacher at your school - regardless of discipline - as an avid reader. Students look up to their teachers. Even if they're cynical or rebellious, the things that students see their teachers doing stay with them. Encourage your teachers to bring their favorite (appropriate, accessible) novels to school with them to 'get caught' with; make posters or lists of what teachers are currently reading, and display them in your school hallways.

16. Promote ways to share what students are reading on social media. Students spend a lot of time on social media, and many view this as an issue - and, likely, you don't want to create campaigns that encourage students to do so at school.

However, the fact remains that it's best to meet students where they are. Start a Facebook, Twitter, or Instagram page, for example, for your school's library and use it to write funny reviews of books, announce school-wide reading challenges, or discuss parts of books that you know students are reading (due to popularity or because they are assigned them in school).

17. Create a collaboration with your local community library. In addition to enhancing the library that's on your school premises, it's a good idea to work with the library that's in the community as well. Local libraries often have literacy initiatives for students of all ages (including adults), and may offer after-school programs, essential services, or resources available for students that will help them grow. Establishing that connection should be mutually beneficial for both you and for your community library.

18. Host a young author conference, or find other ways to support young authors in your community. This should be another mutually beneficial activity: Young authors are always looking for ways to spread the word about their offerings, and the students at your school should know about the ways that people build professions out of literacy skills. Ask the young writing professionals in your area to come to your school and speak about how they get ideas, their writing habits, and other lessons they've learned from writing for years. Afterward, you may be able to connect any budding writers in your school district with a young author as a mentorship connection.

19. Ask students and teachers alike to write book reviews for your school. Whether it's for a favorite book or a book that's part of your school's curriculum, these short-form pieces can be assigned or voluntary - and then spread among the school. This will allow your students to practice the art of opinion-sharing, reviewing, and providing relevant commentary on a universally-experienced subject. You can display these book reviews on your social media accounts, in the school library, or even printed on bookmarks that can be distributed by your school system.

20. Host a series of creative, unique, and fun library events, such as a mystery check-out day. Wrap books from your school's library in wrapping paper, and encourage each of your students - or all of the students from a specific class - to check out a book. The secrecy will add to the appeal of the exercise. This is a fun way to encourage students to check out a new type of book that they might not ordinarily have tried on their own (Tyson, 2020).

Specific Grade-By Grade Approaches to Teaching Literacy and Reading Skills Well

We've discussed some fun and practical measures that you can take to ensure that your school is an environment in which it's easy to learn and grow in literacy skills. However, it'll take much more than simply enhancing your school's environment to solidify a smart whole-school strategy for making sure that your students have a comprehensive foundation in literacy (Peter Underwood Centre, 2020).

Next, we'll outline several features that should be exhibited in the effective demonstration of good teaching practices for the whole school as well as for each age group (Peter Underwood Centre, 2020).

Indicators of High-Quality Literacy Support

For all grade levels:

- Class time and individual instruction devoted to the development of oral language skills

- Examples of high-quality literature used throughout the curriculum (e.g., not only in literature classes)

- Several different ways of disseminating information, including visual, spoken, written, and multimedia forms, for all subjects

- Students who read for fun as well as class assignments

- Students who turn to literature as a first recourse for research assignments (instead of, for example, merely Googling an answer)

- Frequent assessment of student growth in spoken, written, and reading forms of literacy - even basic ones - so that a teacher can step in and provide support if needed

- Real-time student data used to inform all teaching practices

- Examples of good writing found (and expected) across all subject matters, not just in writing or literary classes

For preschool, kindergarten, and early-grade students:

- At this age, it's critical to see explicit, systematic instruction to help children bring together any verbal, phonic, or written concepts that they may have gleaned from activities at home with their parents. Introducing the concept of printed letters, curating awareness of phonological concepts, building vocabulary, and starting easy reading comprehension drills are key (Chancellor State College, 2019).

- In order to provide baseline data that will be helpful for teachers and students alike in later years, it's vital to begin diagnostic assessments now for students. While, in the very early years, formal reading comprehension or written testing may not be appropriate, the students' educators can assess each student's proficiency in groups of micro-skills such as knowledge of words, phonic knowledge, and comprehension of orally-presented stories (Chancellor State College, 2019).

For elementary school students:

- Once a student has made it past the introductory levels of literacy, reading, and phonic instruction, in the following grades it's important for teachers to provide ongoing instruction across these areas.

- At this stage, it's a good idea to start introducing the concept of independent reading (previously, the focus was likely more on group story time). Providing books that are likely to be of interest at this stage is crucial for igniting the spark that will turn into a lifelong love of reading. Guided reading is also good at this stage - part in-class group reading, part discussion of intervening parts of texts that are read on their own time.

- At this time, teachers can also introduce the idea of students reading to learn new subject matter on their own - a concept that will be crucial in later grades, where students will be expected to take more initiative and authority over their own reading and writing skills.

- Ultimately, the shift during the elementary school years will be transitioning from 'learning to read' to 'reading to learn.' Students will have to read and exhibit reading and writing skills in subjects other than literature classes, as well as demonstrate more advanced comprehension skills (such as connecting ideas between texts and asking follow-up questions prompted by texts) (Chancellor State College, 2019).

For middle school students:

- When students reach their pre-teen and teenage years, it's time that they exhibit a heightened focus on independent reading. However, they should also maintain their participation in and contribution to guided and shared reading experiences to bolster their intellectual relationships with their peers.

- At this time, teachers can introduce specific strategies teaching students how to 'read to learn' well, including extrapolation and connotation skills, building vocabulary (and guessing new vocabulary words in context), parsing out the specific structure of new texts, and connecting ideas across different sets of literature (Chancellor State College, 2019).

For high school students:

- When students reach high school, they should have cemented independent reading habits - even students who don't identify as 'readers.' When your classes participate in shared reading experiences, students should be able to read aloud with ease, demonstrate comprehension of the text, and be able to participate in group discussions.

- At this stage, a student's vocabulary should be quite wide, encompassing increasingly complex terms.

- As they gain familiarity with more and more niche types of subject matter, students should receive instruction in the specific ways of writing across different fields (e.g., scientific writing, technical writing, speech writing).

- Teachers should review students' reading and writing skills and provide direct feedback on literacy components of their work in addition to their correctness within the given subject matter (Chancellor State College, 2019).

The Standards of Literacy Education (and Relevant Support Frameworks) for a School-Focused Approach Toward Progress

Now that we've discussed methods by which teachers and external agents can tell just how well a school is supporting literacy efforts in a grade-by-grade manner, we can talk about practices and pedagogical frameworks that the entire school can (and should) implement.

Ideally, if you look at the way that an entire school supports reading and literacy growth for its students of all ages, you'll want to see:

- A positive, healthy environment that tells students both overtly and subconsciously, over and over, that they can be successful readers and writers.

- An agenda that everyone knows about that assumes that literacy improvement is the goal.

- Teaching practices used by all teachers to promote a sense of uniform comfortability for each student and among all students

- Teaching practices that are strategic and evidence-based, generated to help students and teachers alike meet data-based timelines and targets

- Clear indications all over a school's campus that tell students that reading is good for learning and also a fun, life-enriching activity.

There are some *behaviors* and *pieces of evidence* that often accompany schools that invest in literacy growth that you may want to look out for.

Evidence that a school invests well in literacy growth for all students may include:

- A school newspaper or newsletter that students and teachers read and contribute to regularly

- A thriving calendar of parent talks and workshops geared to help students thrive

- A library that is rich with resources for students - and that is well-attended by students, for fun as well as out of necessity

- A diverse reading list for each grade that draws on a variety of different genres - e.g., classic texts and modern texts, with change from year to year

- Well-designed, comfortable places to sit and read around the school that aren't isolated to the library

- Consistent participation in national literary events - for example, Book Week, or National Literacy and Numeracy Week

Behaviors that are often found in schools that have a whole-school approach to literacy learning may include:

- Consistent demonstrations of high expectations regarding reading and writing goals

- A clear positioning of reading for enjoyment: Teachers and students alike are often seen selecting books to read for pleasure

- An integration of clear-cut reading goals enmeshed throughout the curriculum, not just isolated in English or literature classes

- Teachers who know their students. In this ideal scenario, educators are aware of the individual abilities, developmental tendencies, learning characteristics, and cultural backgrounds of each and every student.

- The school's very environment is engineered to encourage the formation of the 'whole reader' - someone who is interested in reading, motivated to read and learn new reading and literacy skills, and has confidence that they can succeed.

- The budget, in this scenario, is allocated to support techniques for reading instruction - techniques potentially specific to each school, as demonstrated by data. These techniques can include purchasing the latest programs and materials that work with the latest research in how young brains learn literacy skills, targeted development for professional staff, and even just better ways to assess literacy development for each student on a granular level.

- Finally, in this utopian picture of a school fully dedicated to literacy development on all levels, the parents of each child engage in their student's reading journey - and they do so with rich support from their school.

How do we make this happen? In concrete terms, you'll want to invest in your school's tools for *assessments, feedback, tools for growing literary capacity, and pedagogy practices*. Let's take a look at each of those in turn and examine behaviors and tools that can truly help a school support its students from each of these crucial angles. We'll start at the beginning, with diagnostic processes that can help schools realize precisely where their students are, so as to best provide those students with the best support practices possible (Chancellor State College, 2019).

Assessment and Data Practices

Schools that support literacy growth for each and every student well are schools that place a high priority on analysis - on a school-wide level - of clear, concise, and eminently-usable data.

These schools zoom in on a granular level on each student's progress, every week, to systematically collect information on each student's achievement levels. These

assessments are not regarded as punitive - in fact, for many high-achieving schools, the mode of assessment is changed, regularly, so students don't feel like they are sitting through an endless series of boring exams.

After each assessment, teachers regularly meet to analyze the data for each student. Teachers then use that specific data to update their own teaching practices. This also allows teachers to identify, very early on, any students who may be outliers in terms of their literacy performance - whether they're performing at gifted levels or if they are going to need support to keep up with their peers. With this information, teachers can reach out with tiered support strategies for either kind of outlier.

Evidence and Behavior that Points to a School's Proficiency in This Area

- A wide range of data that speaks to a holistic view of a student's capabilities. For example, instead of assessments that are simply multiple-choice exams, many different types of student performance examples are used, including student journal entries (analyzed with permission), observation of the student, work samples from across a student's entire portfolio and subject range, questionnaires and surveys, self-assessments, and conversations with the student

- Documentation of each student's reading performance, as well as school reading trends, kept in an accessible and safe central location

- Up-to-date tools used for analysis, interpretation, and visualization of the data that comes from these assessments, so it's very clear that every teacher has access to up-to-date information about their students

- An assessment schedule that doesn't overload students or teachers but allows for the consistent collection of helpful, usable data

- Learning targets that are created after review of the data coming out of these assessments

- Involvement of the entire cast of characters in collaborative assessment practices; for example, teachers are not administering assessment practices on passively-involved students, but teachers, students, parents, and even administration are all involved in the assessment and analysis process

- Any results that represent downward trends for a student or for an entire group of students should be viewed as an opportunity, and any conversations that stem

from this data should be focused on moving forward and stimulating growth. Teachers will assume responsibility for the progress of their students.

Teacher Talking Points to Assist with Growth in This Area

- What assessment and monitoring tools are we using?

- How are we using the output of those tools to inform our learning and teaching practices?

- What types of processes do we have in place for constantly collecting and analyzing reading data from our students?

- When we get that data: What is it telling us about how effectively we're teaching literacy and numeracy to our students?

- Are students making enough progress to confidently promote from one year to the next? Are the students who have performed poorly in the past improving? Are average students becoming top performers? Are our high-achieving students consistently performing well?

- Do we have documented targets that are reading-related that we're ready to help our students achieve this year?

- Does the data that we're getting from our assessment and monitoring practices make sense when combined with our literacy teaching efforts? Do we see any surprises?

- Does the data show us any students who need more literacy support than we're giving them (Chancellor State College, 2019)?

Planning and Pedagogy Practices

When it comes to specific teaching and learning procedures, a school that approaches literacy instruction and growth strategically will emphasize the need for curricula that caters to the needs of a diverse student body. In this scenario, teachers will work hard to provide a safe yet challenging environment for students to further their reading and writing skills through systematic and highly strategic learning modules.

Evidence and Behavior that Points to a School's Proficiency in This Area

- Collaboratively-generated curricula that is uniform across the entire school which is catered to address both nationally-recognized standards and more localized needs and issues

- Processes put in place that make it easy for teachers to plan lessons together, to benefit from different talents and skillsets as well as different levels of experience

- Clear classroom and daily routines put in place for students that leave time open for the enjoyment and perusal of consistent reading habits

- Availability of different avenues for literacy training that are available for each student that address the different learning modalities that a student might have - for example, easy-to-use (and -access) audio recordings of books or computer programs that promote literacy

- Frequent use of student reflection and assessment practices, including journals but also one-on-one dialogues between students and teachers so teachers have a good idea of the way each student can communicate in written and oral pathways

- Tools and techniques are constantly taught to students to aid them in becoming more independent learners - for example, students are given take-home charts and posters to help them chart their own learning habits

- Each week includes a range of different learning projects and approaches for each student - including listening, speaking, writing, and reading opportunities in each week, integrated across the different subjects a student might tackle - in order to provide a sense of consistent variety to make a student's literacy efforts interesting

- Clear attempts are made to create strategic, purposeful reading instruction that enhances a student's understanding of grammar, of decoding abilities, of fluency and comprehension, and oral tradition, instead of simply reading for content or to fulfill a requirement

- Students are encouraged to read and write both as a response to direct teacher prompts as well as for their own sense of fun and enjoyment

- The specific reading and writing requirements and expectations for each grade level are very identifiable, accessible, and even made public so that every member of an academic community is aware of the goals that lie before them

- Teachers celebrate when students take risks in terms of their responses to prompts or assessments; thinking outside of the box is framed as a good thing, and teachers expect that many different responses to a learning opportunity will happen

- Students work with each other, maximizing the benefit of their different learning modalities and talents in order to help each other succeed

Teacher Talking Points to Assist with Growth in This Area

- Do all of the teachers on our staff have a good knowledge of the literacy requirements in our region? How are we practically working to ensure this?

- Do all teachers go out of their way to make specific links between reading and writing and their practical purposes when teaching them in the classroom?

- Do we have processes in place to best train our volunteers and support staff so they're effectively helping students move along their literacy journey?

- How do teachers - even ones outside traditional literature or English disciplines - proactively and creatively (e.g., not just by assigning chapters to review at home) teach reading through their subjects?

- Do teachers use the data collected on student's reading abilities to inform the way they teach literacy (Chancellor State College, 2019)?

Helping Your Students Build Literary Capacity

A school that places a high priority on building literary capacity is one that realizes - at heart - that it is a pre-professional organization. Literacy and literary capacity refer to skills that your students will need throughout their careers and personal adult lives. Aiding students in developing these reserves and skills will help them best contribute to society, in their own ways, when the time comes.

One way to naturally emphasize the idea that building literary capacity and literacy skills is a lifelong journey - an idea that could make the concept much more accessible for young, struggling students if presented the right way - is to present teachers as lifelong

learners as well. Teachers should naturally commit to improving their own skills and knowledge for their own sake as well as for the sake of their students. Allowing students to see that process as it happens will create a larger sense of community that all can enjoy.

Evidence and Behavior that Points to a School's Proficiency in This Area

- Teachers that are aware of and belong to professional teaching groups, and invest in their careers through ongoing education to further their own proficiency as educators

- An allocation in the school's budget for professional development for the staff, as well as personal professional development plans for each member of the staff

- The professional development plans for each teacher include ongoing instruction in practical literacy and numeracy training of their own - for example, the effective use of assessment data to aide their students, or ongoing techniques for mentoring young writers and readers

- A professional library at the school where students can learn about the different types of professions out there, learn about pre-professional organizations and opportunities in their areas of interest, and obtain resources that will help guide them to future success

- Teachers work together often and exhibit a high level of trust, often sharing best practices or highly-used resources

- Teachers are fearless of being experimental when it comes to their lesson plans and related techniques

- Teachers, teacher aides, and classroom volunteers all receive a high amount of effective support to help them help each other while assisting children as they go about their daily routines

- The school has regional support available - community literacy coaches, for example - to assist teachers and students alike with any identified needs

Teacher Talking Points to Assist with Growth in This Area

- How does our school support teachers professionally as they support their students in their growth of literacy? Is teacher development a priority?

- Do we use the natural reading expertise of our teachers and leadership team?

- Is there a way we could provide coaching or tutoring to students and teachers alike who feel that they have not adequately progressed in their literacy skills (Chancellor State College, 2019)?

Approaching Feedback Strategically

Think back to your own school days: Did you love exams? Look forward to pop quizzes? See the point of every test?

In a school that supports the growth of literacy skills for every student, including (or especially) those who struggle, there is going to have to be a lot of assessments. However, this can be difficult for students to learn to enjoy. One way to help students see the utility of this process is to celebrate the necessary but often-overlooked step of giving empathetic and effective feedback.

This should be a system that operates on two levels. The school administration or oversight committees should strive to give feedback to teachers on a professional level to help teachers support their students in an ever-more-useful way. Teachers will then work to support their students in a similar fashion by providing catered feedback, unique to each student, that will help them understand how they are doing and provide them with updated goals that they can work to meet.

Evidence and Behavior that Points to a School's Proficiency in This Area

- Formal protocols among the teaching staff to aid in routine and uniform feedback and observation of teacher performance

- Ongoing feedback, both written and verbal, that is provided to teachers to help them improve their own practices regarding teaching their students.

- Similarly, students receive ongoing feedback - both written and verbal - to help them understand where they are in their learning and literacy journeys.

- Structures are in place to ensure that the feedback given to students offers them clear advice, encouragement, and specific steps to help them further their own learning and literacy goals.

- Specific pieces of work that students have generated are returned to the students with factual, objective, and helpful comments. (This is often more helpful to

students than a standalone assessment of a student's work, as it is tied to a concrete example of their performance).

- Teachers receive specific ongoing professional development to help them learn how to give better feedback.

- Students are asked on a regular basis as to how teacher feedback made them feel and whether it motivated them to work toward success.

- The school has written procedures to help teachers conduct one-on-one conferences with their students.

- Parents receive information about student feedback and how the student is progressing toward their learning and literacy goals.

- All of the student feedback across teachers and programs is stored in one easily-accessible centralized location.

- Any teacher aides or classroom volunteers receive ongoing feedback from teachers as to how they could increase their support of individual students' literacy journeys.

- Students receive regular feedback that helps them progress with their reading competencies.

- Students regularly use a self-assessment tracker (such as a reflective journal) to document how they are feeling about their learning and literacy journey.

Teacher Talking Points to Assist with Growth in This Area

- What systems do we have in place to help teachers share feedback with other teachers, students, and the leadership team at our schools?

- Do we have the systems in place to provide every teacher with personalized feedback about their reading and writing mentorship and teaching processes?

- How do teachers - even those who don't technically teach reading - provide feedback to students about their reading and writing performances? Are these processes as effective as they could be?

- Do we have a specific way that we celebrate reading and writing success stories?

- Are we getting parents involved in the reading, writing, and feedback cycle as effectively as we could?

- Can all teachers on staff point to an example of past feedback that has actually informed or influenced their writing style?

- Do students provide reflections or feedback on their perception of their literacy and numeracy journeys? Is this information used appropriately (Chancellor State College, 2019)?

The Link Between Literacy and Global Citizenship

In the 21st century, the boundaries between different communities and countries are disappearing. Whether physical, political, or cultural, it's now very clear that - even though we may disagree at times with people who think differently from us - we're all living as global citizens; all facing the same problems; all with a need to work together to find global solutions to benefit us all (Peterson, 2020).

As a result, we're finding ourselves in a situation where we must embrace a larger, more holistic perspective. We must find ways to see the world through other people's eyes, and we must develop ways to communicate effectively (Peterson, 2020).

This requires widespread, uniform literacy skills. A sense of global literacy is what will enable us to not only communicate well but think critically of strategies that can help us all work better together. Finally, a sense of literacy will also enable both individuals and entire communities to act conscientiously - for the benefit of the global community, and not just in their own interest (Peterson, 2020).

With this as the lofty end goal, it becomes very clear that educators have the power to create change on a huge level. When putting together instructional strategies and content, educators need to promote not only literacy but layered literacies. For example, instead of just helping children read any book, it's a good idea to help children realize that there is a wide world of literature out there, literature which represents a thousand different worldview (Peterson, 2020).

Through increased literacy, children can learn about environmental, geographical, cultural, and financial issues - and develop strategies for putting together creative solutions. The door that opens the way toward this mutually-beneficial end is literacy - and that door is locked for some (Peterson, 2020).

It's important to find ways to keep that door open - and to make sure that when children are able to walk through it, they can access the multifaceted tools that will allow them to change the world when it is their time.

Here, we present a few easy ways for teachers to promote literacy and global citizenship through simple efforts in their classrooms.

Suggestions for Helping Students Embrace Literacy and Global Citizenship in Your Classroom

1. Focus on allowing your students to discover and share their own stories. Helping all students realize that they have a story and that they can frame their own experiences as a compelling narrative will help them with their confidence - and it will also help them learn ways to connect with others. If the students in your classroom come from many different backgrounds, find opportunities - both formal and informal - for them to share their experiences with you and with each other.

2. If your students are multilingual, embrace that fact. Celebrating even small instances of ways in which we subconsciously use other lingual systems makes it clear that familiarity with the ways that other people speak is a benefit, not a deficit. Slipping small snippets of other languages into your classroom's routine vernacular will help your students realize that English is not the default way that the entire world communicates.

3. As you're filling up your classroom with stories and images and resources for your students to learn, make sure that they are as varied and diverse as possible. The world is a large, beautiful, and varying place - yet many students tend to see only their own cultures reflected in their classrooms. Put stories from other countries and cultures on your bookshelves. Make sure that your students have access to currently underrepresented narratives. This will have a side benefit of helping to familiarize your students with the unfamiliar. You'll help your students embrace curiosity and an open mind, instead of a disposition that may tend toward confusion and ridicule in the face of the unknown.

4. Encourage your students to read and write and speak and listen, not just for school assignments, but for personal expression (and perhaps even fun). Show them that these are forms of communication and creation that can help them live

a fuller life - and that students can use their entire lives to explore their personalities, those of others, and display and use their intelligence.

5. Read aloud in class. This is often reserved for younger grade levels, but it helps dispel the notion that reading is a solitary, private thing. Instead, read aloud and open up the floor for conversation. When literary pursuits are shared experiences, students tend to want to be more involved - and an academic exercise becomes as much a bonding exercise as one strictly for learning (Peterson, 2020).

Summary and Conclusion

As we learn more about the way children learn, we've come to realize that there are many different ways that we can support literacy aims.

We've also come to realize that literacy means so much more than simply enjoying the process of writing and reading. In the 21st century, literacy is an equalizer. Literacy opens doors, literacy forges connections, and literacy allows people to understand each other and work with each other in ways crucial for the survival of the human race. In other words, the importance of literacy cannot be overstated.

Effective, empathetic, and efficient instruction can go a long way toward helping students achieve literacy early in life, when they have the brain plasticity that is most conducive toward making that happen most easily. However, schools need to work diligently to implement frameworks that are likely to make that happen in the most logical way possible. Implementing achievable goals for your literacy efforts, making sure that they align with the standards posted in your region, communicating those goals and efforts to every member of your academic community, and assessing your progress toward those goals should become an integral part of your school's academic identity.

It's also important to remember that literacy and numeracy education, as serious and full of potential as they are, should also be fun. After all, the wide array of literature out there includes many different types of genres, from the strictly literary to more modern, funny, adventurous or artistic examples of literary achievement. This can be seen as overwhelming, but it should be seen as an opportunity. School libraries should be stocked with a wide array of different types of literature - classic, modern, comic, and otherwise - to help children realize that literacy does not have to look like one specific thing, just as success doesn't have to look like one specific thing.

Fortunately, as we move toward ever-enhanced knowledge of how children learn to read and incorporate other literacy skills, as we move into a future where literacy is more and more important, we're also becoming increasingly equipped with ways to support our children. The challenge before us is stark, but the potential benefits we can hope to gain from investing in literacy for every member of our communities will be well worth the effort.

We simply need to realize that the work starts now. As soon as students enter a school's halls, the entire school system needs to be poised to best meet those students where they are, and to painstakingly work toward helping them master literacy achievement. The scale of the challenge is daunting, but it also presents us with a hopeful truth: Every single member of an academic community - teachers, students, administrators, volunteers, and parents - can take strategic, smart action to help every student achieve literacy and numeracy goals.

Resources

University of South Florida. (April 24, 2020). Research Review on Early Literacy. University of South Florida. https://www.usf.edu/education/anchin/research/research-review-on-early-literacy.aspx

UNESCO. (2019). Literacy. UNESCO. https://en.unesco.org/themes/literacy

Peterson, A. (March 23, 2020). Literacy is More than Just Reading and Writing. National Council of Teachers of Education. https://ncte.org/blog/2020/03/literacy-just-reading-writing/

Port Discovery Public Relations. (October 29, 2018). 3 Reasons Early Literacy Skills Are Important for Your Child. Port Discovery. https://www.portdiscovery.org/news-room/3-reasons-early-literacy-skills-are-important-your-child

Literacy Pittsburgh. (2021). Challenges of Low Literacy. Literacy Pittsburgh. https://www.literacypittsburgh.org/the-challenge/

Bell, N. (May 10, 2017). Explainer: How the Brain Changes when We Learn to Read. The Conversation. https://theconversation.com/explainer-how-the-brain-changes-when-we-learn-to-read-76783

SA Reads. (September 29, 2020). Teaching Reading: The Way the Brain Learns to Read. SA Reads. http://www.literacysanantonio.com/blog/2020/9/29/teaching-reading-the-way-the-brain-learns-to-read

Chancellor State College. (November 2019). A Whole-School Approach to Reading. Student Resources. Chancellor State College. https://chancellorsc.eq.edu.au/Supportandresources/Formsanddocuments/Documents/curriculum/whole-school-approach-reading.pdf

Sedita, J. (April 7, 2020). How the Brain Learns to Read. Keys to Literacy. https://keystoliteracy.com/blog/how-the-brain-learns-to-read/

EAB. (2019). How Our Brains Learn to Read. EAB. https://attachment.eab.com/wp-content/uploads/2020/02/PDF-DLF-How-Our-Brains-Learn-to-Read.pdf

Ged. (2021). The Mathematical Brain: How Children Learn to Count. Komodo. https://komodomath.com/us/blog/how-children-learn-counting-a-parents-guide

Peter Underwood Centre. (September 2020). Whole School Approaches to Literacy. University of Tasmania. https://www.utas.edu.au/__data/assets/pdf_file/0005/1365575/lit3-Whole-school-approaches-literacy-final.pdf

Tyson, K. (2020). 25 Ways Schools Can Promote Literacy and Independent Reading. TeachThought. https://www.teachthought.com/literacy/25-ways-schools-can-promote-literacy-independent-reading/