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A Quantitative Synthesis of Research on Writing Approaches in Grades 2 to 12

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Abstract

This paper reviews research on outcomes of writing programs for students in grades 2 to 12. Studies had to meet rigorous standards of research including use of randomized or well-matched control groups, measures independent of the program developers, researchers, and teachers, and adequate sample size and duration. Fourteen studies of 12 programs met the standards. Twelve (86%) were randomized, two matched. Programs were divided into three categories. Student achievement effects on writing were positive on average in all categories (Effect Size=+0.18), with similar outcomes for writing programs focused on the writing process (ES=+0.17), those using cooperative learning (ES=+0.16), and those focusing on interactions between reading and writing (ES=+0.19).

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The ability to express ideas in writing is one of the most important of all skills. Good writing is a mark of an educated person, and perhaps for that reason it is one of the most important skills sought by employers and higher education institutions (Conley, 2003; Schmoker, 2018). Effective writing is essential in civic engagement, enabling people to state their views effectively in politics, social life, and business. The rapid growth in use of technological communication devices is increasing the need for everyone to be able to compose effectively for many purposes (Graham, Harris, & Santangelo, 2015).

Yet among the "3 R's" (reading, writing, and arithmetic), there is far less research on writing than on the other basics. This is especially true in the U.S., where teaching of writing has greatly diminished as accountability systems emphasizing only reading and mathematics have pushed writing out of the curriculum in many places, decreasing interest in research on the topic. Despite evidence that the teaching of writing can improve outcomes in reading (Graham & Hebert, 2011), there is little focus on writing for its own sake.

Although reading and writing can be seen as two sides of the same coin, and do have many similarities, writing is also very distinct. A good writer must have something to say, must have a plan for how to put ideas into written form, and must be able to reflect and self-edit to be sure that a written product communicates with its desired audience. Necessary writing skills are very different for different purposes and genres. For example, the ability to write a comparison–contrast composition is very different from writing a personal narrative or humor, and writing a business letter requires very different skills from writing poetry. There are language mechanics skills, such as grammar, punctuation, usage, and spelling, that are important in all areas of writing, and one might argue that there are elements of persuasive and informational writing that

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underlie many more specific genres. But a proficient writer needs a broad range of experience and skill to take on any particular task to appeal to any particular audience.

A remarkable proportion of all research and reviews of research has been carried out by Steven Graham and Karen Harris and their colleagues. Based on their reviews of their own and others' research, especially focused on students who are struggling writers, they have proposed a set of consensus conclusions about what is known about effective writing strategies in elementary and secondary schools. Their key conclusions are as follows (from Graham, Harris, & Santangelo, 2015):

1. Establish writing routines that create a pleasant and motivating writing environment (Graham & Perin, 2007).

   To write well, students need to be excited about the opportunity to express themselves, not fearful about making mistakes. Effective writing teachers model their own enjoyment and excitement about writing, celebrate good writing by displaying it or putting it into class anthologies, attribute success in writing to effort rather than ability, encourage sharing of writing drafts among peers, and assign writing tasks appropriate to students' interests and needs.

2. Implement a process approach to writing (Hillocks, 1986; Sandmel & Graham, 2011).

   Writing process models give students extended opportunities to write. They usually include writing teams in which students help each other plan, draft, revise, edit, and "publish" compositions. Two examples are Self-Regulated Strategy Development

(Graham et al., 2012) and Writing Wings (Madden et al., 2011), described in some detail in the "Findings" section, below.

3. Create routines that ensure that students write frequently.

   Not surprisingly, students who write more write better (Graham & Perin, 2007; Gallagher & Kittle, 2018). Practice in writing is especially important in giving students opportunities to write in many genres and for many purposes and audiences. Adding 15 minutes of writing each day can make a substantial difference in writing outcomes, and contributes to reading outcomes as well (Graham et al., 2015).

4. Design instructional routines in which students compose together.

   Process writing programs usually involve students working together on compositions. In England, the Paired Writing Program (Yarrow & Topping, 2001) taught students to work with each other at each stage of the writing process. Students had "help sheets" for each stage of the process, asking questions such as, "is the writing suitable for its purpose and for the reader?" and later on, "does each sentence begin with a capital letter and end with a full stop?" For example, partners may help each other plan what each will write, give feedback on a rough draft or "sloppy copy," respond to a revision, and suggest edits for spelling and punctuation, before each student produces a final product. In each case, the peer is able to provide helpful and supportive feedback, before the teacher does the same review of students' work. As a practical matter, this frees teachers to spend more time on

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drafts that are already better, but there is much anecdotal evidence to the effect that students learn a great deal from responding to others' drafts, gaining insight into ways to improve their own writing.

5. Establish goals for students' writing (Rogers & Graham, 2008).

Setting high but realistic expectations for what students are to achieve is important in motivating them to do their best. Graham et al. (2015) provide two examples of high but attainable expectations: "add three new ideas to your paper in revising it," and "address both sides of an argument, providing three or more reasons to support your point of view and countering at least two reasons supporting the opposing view."

Other basic principles advocated by Graham et al. (2015) include providing frequent feedback, ensuring students acquire writing skills, knowledge, and strategies, and teach handwriting, spelling, and typing. They support teaching sentence construction and sentence combining.

Methodological Problems in Research on Writing

While there is a great deal of research on writing, including the research that validated the principles emphasized by Graham et al. (2015), much of the research uses research designs and measures that are susceptible to substantial inflation of effect sizes. Graham et al. (2015) excluded studies lacking control groups and ones without quantitative, objective outcomes, but much writing research involves very small samples, measures closely aligned with the experimental program but not fair to the control group, and very brief study durations, all of

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which have been found to greatly inflate study outcomes (Cheung & Slavin, 2016; Inns et al., 2018; Pellegrini et al., 2018). There are studies of writing methods that do not have these problems, but they are much smaller in number than are rigorous studies in reading or mathematics, for example.

Purpose of This Review

The purpose of this review is to provide meaningful, useful information on approaches to writing instruction that have met high standards for research, essentially the standards the Education Endowment Foundation applies to its own funded studies. Using these rigorous inclusion standards restricts the review to a modest number of studies, but the findings from these studies can be trusted to a greater degree than could a review that accepted many more studies meeting lower standards.

Methods

The review methods used in this review are similar to those of Baye et al. (2018), a review of secondary reading approaches, with appropriate revisions for the unique case of writing.

Inclusion

Studies were considered for possible inclusion according to a standard set of criteria, as follows.

1. Studies had to evaluate writing programs, or programs focused on key components of writing, such as grammar, punctuation, usage, and spelling. Studies of reading methods

were also included if they had a strong emphasis on writing and used post-tests including writing or language arts outcomes.

2. Studies had to take place in regular schools (not in special education) in grades 2-12. They had to take place in industrialized countries that use an alphabetic writing system.
3. Studies had to be reported in 1990 or later. Studies of technology applications had to be reported in 2000 or later, because of the rapid changes in technology over time.
4. Students, classes, or schools could be assigned at random to experimental and control treatments, or matched based on pre-tests and demographics, as long as matching was done in advance.
5. Studies had to include a control group also being taught comparable writing skills, but using different methods (usually standard teaching of writing).
6. At pre-test, experimental and control groups could not differ by more than 25% of a standard deviation. Pretest differences in the analytic sample (after attrition) also had to be less than 25% of a standard deviation.
7. Differential attrition (loss of students between pre-test and post-test) had to be no more than 15% greater in one treatment group than in the other.
8. Measures created by researchers or developers, overaligned with content or procedures taught in the experimental group but not the control group, were not accepted. For example, a study of persuasive writing that used an independent measure of persuasive writing would be accepted if the control group was also learning persuasive writing, but would be rejected if the control group was not being taught persuasive writing. Studies find that use of measures made by researchers and aligned with the experimental treatment greatly inflate effect sizes (Cheung & Slavin, 2016).

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9. Writing measures scored by the students' own teachers were rejected, as this would increase the potential for bias.
10. Studies had to have a duration of at least 12 weeks. Brief studies tend to inflate effect sizes (Pellegrini, 2018).
11. Studies had to have a sample size of at least 30 students and two teachers in each treatment.

Statistical Procedures

For each accepted measure, effect sizes were computed for each measure. We used a formula as follows:

$$ES = \frac{X_t - X_c}{SD_c}$$

That is, post-tests adjusted for pre-tests and other covariates were compared in treatment and control classes or schools, and then divided by the student-level, unadjusted standard deviation of the control group. When the control group SD was not available, a pooled SD was used. We used procedures described by Lipsey & Wilson (2001) to compute ES when less usual statistics were presented.

After computation of effect sizes for each measure, study means were computed, and then means for programs and categories of programs were computed, weighting by sample size (inverse variance).

Findings

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Characteristics and outcomes of studies that met the inclusion criteria are summarized in Tables 1-3. Most studies included measures of language mechanics and other measures beyond writing, but there were not enough studies of any particular outcome to analyze systematically, so this review focuses on creative writing, not mechanics. However, outcomes for other measures are described in each study description and in Tables 1 to 3.

Writing Process Models

Writing process approaches teach writing by engaging students in a step-by-step sequence of planning, drafting, revising, editing, and "publishing" (or completing) compositions in multiple genres. Such models make use of peers to help each other through the process, and emphasize teaching of meta-cognitive strategies such as graphic organizers, timelines, mnemonics, and self-talk. Four studies of two programs emphasized writing process (see Table 1). The weighted mean effect size for writing measures in these studies was +0.17 (n.s.).

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TABLE 1 HERE

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Self-Regulated Strategy Development, or SRSD, is the most extensively evaluated of all writing programs in the US (Graham et al., 2012). However, most SRSD evaluations took place in special education settings, did not meet the sample size or duration requirements, lacked control groups, or otherwise did not meet inclusion standards. The approach is designed primarily for students who are poor readers and writers. They are taught strategies to plan, draft, edit, and revise writing products in many genres. Students learn specific scaffolds and self-

regulation strategies to help them know how to get their ideas organized and down on paper and then to evaluate and improve their own work.

A U.K. adaptation of SRSD called Improving Writing Quality (IWQ) was evaluated in grades 5 and 6 in Calderdale, West Yorkshire, with funding from the Education Endowment Foundation (EEF). The adaptation added experiences for students to stimulate their imaginations for writing (although control students also received these experiences). These included field trips and visits to classrooms by veterans and other interesting people. Fifth grade teachers received two full days of professional development on SRSD methods, followed by ongoing consultation from peers.

The main elements of SRSD lessons for each genre were as follows:

- Discussion of the genre
- Pre-assessment
- Mnemonics (e.g., iPEELL: **I**ntroductory paragraph, **P**oints, **E**xamples/elaboration, **E**nd, **L**inks, **L**anguage)
- Graphic organizers
- Self-scoring and graphing
- Self-talk
- Peer scoring
- Final assessment

An evaluation by Torgerson & Torgerson (2014) focused on low-achieving fifth grade students in 23 elementary schools. The schools were randomly assigned to IWQ or control conditions. Treatment began after students took spring standardized tests. The students from the

elementary schools were then followed into 3 secondary schools, where they were maintained in their conditions through the first semester of sixth grade.

Outcomes strongly favored IWQ on the main outcome, writing scales from Progress in English (PiE), which focuses on persuasive and informative writing. These skills were emphasized in IWQ. The effect size for all students was +0.74 ($p<.001$), and for students qualifying for free school meals it was +1.60 (though this was not significant due to low sample size). Effects were slightly negative for grammar and spelling (ES= -0.13, n.s.), and for reading comprehension (ES=-0.09, n.s.).

A second, much larger evaluation of SRSD involved a writing process approach called IPEELL, for Introduction, Point, Explain, Ending, Links, and Language. Torgeson et al. (2018) evaluated IPEELL in 84 primary schools in Leeds and Lancashire, U.K., serving 2,682 students. In this SRSD adaptation, the trainers were teachers given IPEEL training, but were not SRSD experts as in the Calderdale study. Two cohorts were involved. One was schools randomly assigned to use IPEELL in fifth grade only, or to continue business as usual in a control group. The other cohort was schools randomly assigned in fourth grade, which continued in their assigned treatment through fifth grade.

Like all writing process approaches, IPEELL involves students in a cycle of planning, drafting, editing, and revising compositions in various genres. As in the earlier study, students in IPEELL participated in "memorable experiences," such as field trips or visits by interesting people, to stimulate their writing. However, in this study, control as well as experimental students received these experiences.

Outcomes of the IPEELL evaluation were very different from those of the earlier Calderdale study. In the one-year trial (grade 5 only), the control group scored non-significantly

higher than the experimental group on standardized tests of writing (ES=-0.09, n.s.). The two-year cohort (grades 4-5) found non-significant positive effects on a writing test composed of items from previous writing tests (ES=+0.11, n.s.). The average effect size across the two cohorts was +0.01. Outcomes for students qualifying for free lunch were very similar, averaging +0.04 (n.s.) across the cohorts.

In both the one-year (grade 5) and two-year (grades 4-5) trials, measures of non-writing outcomes favored the control group. This was true in reading (ES= -0.23, $p<.05$), spelling (ES= -0.22, $p<.10$), and math (ES= -0.22, $p<.10$) for the one-year trial, and for reading (ES= -0.17, $p<.05$), spelling (ES= -0.28, $p<.05$), and math (ES= -0.30, $p<.05$) in the two-year trial. These distressing findings may derive from an excessive focus on writing, leaving reading, spelling and math with inadequate attention.

One clue to the different findings in the earlier Calderdale study and the Leeds/Lancashire study is provided by a subanalysis of writing outcomes for high and low achievers. For the two-year cohort, low achievers averaged an effect size of +0.26, which was nearly significant ($p<.10$), in contrast to the high achievers (ES=+0.06, n.s.). The Calderdale study was limited to low achievers, so it is possible that the Leeds/Lancashire study did replicate the Calderdale findings with this group. However, there was no such trend for the one-year cohort (for low achievers, ES= -0.13; high achievers, ES= -0.02).

The weighted mean for all students across the Calderdale study and the two cohorts of the Leeds/Lancashire study was +0.22 ($p = .06$).

The 6+1 Trait Writing Model is built around an approach to analysis and evaluation of writing that emphasizes six traits: Ideas, organization, voice, word choice, sentence fluency, and conventions. The "+1" is presentation (e.g., form and layout). The model is designed to

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supplement other writing approaches by providing specific criteria to assess writing. In particular, it was designed to supplement writing process models by providing a focus for self, peer, and teacher evaluations of writing products.

Two major studies (Coe et al., 2011; Kozlow & Bellamy, 2004) have evaluated the 6+1 Trait Writing Model. An Oregon study involving fifth graders in 74 schools found small but significant positive writing effects (ES=+0.08) on a holistic evaluation of student essays (i.e., not on the six traits themselves, which did not meet inclusion requirements due to being made by developers). Kozlow & Bellamy (2004) found an effect size of +0.04. Across the two qualifying studies, the mean effect size was +0.06 (n.s.).

Cooperative Learning

Cooperative learning writing programs emphasize students working in small groups to help each other with writing. They resemble writing process models in using a plan-draft-revise-edit cycle, but place a much stronger emphasis on cooperative writing groups. Four studies of four programs are summarized in Table 2. They had a weighted mean effect size on writing measures of +0.16 (n.s.).

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TABLE 2 HERE

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Writing Wings is an approach to teaching writing in which students work in writing teams to help each other through writing process activities. That is, students help each other plan, draft, revise, edit, and "publish" compositions in various genres such as personal narrative, comparison/contrast, business letter, and persuasive. Teachers are given specific guides to

teaching overall writing process and then guides for each genre. In addition, students view videos in which a writing team composed of humorous puppets works together to model writing processes. Each team member in the videos models a unique set of strengths and weaknesses as a writer.

Madden et al. (2011) carried out a randomized evaluation of Writing Wings in 22 high-poverty schools in urban, rural, and suburban locations across 11 US states. Students in grades 3-4 were given one of two writing prompts at pre- and post-tests, and these were scored by raters unaware of students' treatment assignments. Raters were given examples of students' writing indicating different ratings within each grade. Effects were positive but not statistically significant at the cluster level for style (ES=+0.17) and ideas and organization (ES=+0.08), for a writing mean of +0.13. For mechanics, the effect size was +0.12.

Student Team Writing is a cooperative learning program for middle schools in which students work in four- or five-member teams to help one another build reading and writing skills. Students engage in partner reading, story retelling, story related writing, word mastery, and story-structure activities to prepare themselves and their teammates for individual assessments and compositions that form the basis for team scores. Instruction focuses on explicit teaching of metacognitive strategies. Stevens (2003) evaluated Student Team Writing in high-poverty middle schools (grades 6-8) in Baltimore and found a significant positive effect size of +0.38 ($p<.05$) on language expression. The effect size for language mechanics was 0.00.

Collaborative Strategic Reading (CSR) teaches reading comprehension and writing strategies to students working in small cooperative learning groups. During the first 4-6 weeks of

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the intervention, teachers model reading strategies such as activating prior knowledge, predicting what will be learned from an expository passage, identifying breakdowns in understanding, finding the main idea, and generating questions after reading. During the remaining 12-14 weeks, students are assigned to cooperative learning groups to allow them to master each strategy. The intervention is implemented 50 minutes a day, two days a week, during regular English Language Arts lessons. In a study in Denver (Denver Public Schools, 2016) with children in grades 6-8, small significant positive effects were found on state tests of writing (ES=+0.07, $p<.05$).

Expert 21 uses a mix of teaching, cooperative work, and computer-assisted instruction to provide student texts and supportive materials focused on building English, writing, and comprehension skills, including whole-class and small-group discussions, teaching of metacognitive skills such as graphic organizers, and collaborative projects. Sivin-Kachala & Bialo (2012) found substantial positive effects of Expert 21 on state tests of writing (ES=+0.58, $p<.05$) and positive but non-significant effects on language and literature (ES=+0.22).

Programs Integrating Reading and Writing

Most approaches to writing focus mainly on that subject and clearly related topics such as grammar, punctuation, usage, and spelling, and while they may also contribute to reading gains (Graham & Hebert, 2011), that may not be their primary intention. Similarly, reading approaches may have secondary impacts on improving writing (Graham et al., 2018). However, there are some programs explicitly designed to teach literacy as a unified whole, and to improve performance in both subjects (Graham et al., 2017). For example, such programs often have

students write about texts they have read, and forming arguments based on evidence (as suggested by current Common Core State Standards and college- and career-ready standards). Writing effects of programs that seek to balance and integrate reading and writing are discussed in this section. Table 3 summarizes six studies of five programs in this category. The weighted mean effect size was +0.19 ($p < .01$).

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TABLE 3 HERE

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The College-Ready Writers Program (CRWP) was created to respond to the college- and career-ready standards adopted by almost all states around 2010. It places a strong emphasis on argument writing, using evidence to support arguments from sources, and placing less emphasis on grammar and punctuation.

CRWP provides teachers with a "using sources tool" that walks them through a series of questions in their analysis of students' work. These include ratings from "Skillfully integrates" to "Does not use source material." Another question is, "Does the writing distinguish between the student's own ideas and the source material?" Teachers receive professional development in which they take on roles as students and then analyze the content, observe models, and reflect.

A large study of CRWP was carried out by Gallagher et al. (2017) in 44 high-poverty, rural districts across ten states, over a two-year period. Students were in grades 7 to 10. Districts were randomly assigned to CRWP or control conditions. Students were pre-and post-tested on on-demand writing prompts emphasizing source-based argument writing. Students read four to six short texts and were asked to write an argument based on the texts. These were scored using the Analytic Writing Continuum (AWC), developed by the US National Writing Project, with

adaptations to focus on argument writing. Writing products were scored by raters blinded to students' assignments to conditions. Significant differences favoring CRWP schools were found for content (ES=+0.20, p<.05), structure (ES=+0.20, p<.05), and stance (ES=+0.15, p<.05). Effects on conventions (mechanics) (ES=+0.12, n.s.), were not significant, with a writing mean of +0.18.

Pathway is an approach to secondary reading and writing that is primarily designed to help speakers of languages other than English to succeed in demanding coursework. It provides extensive professional development to teachers, including six full days of in-service, and five after-school sessions of two hours each over a full school year. Teachers provide students with a "tool kit" of cognitive strategies to analyze text or inform their own writing. The tool kit provides strategies for planning and goal setting, tapping prior knowledge by asking questions, constructing the gist, self-monitoring, revising, and evaluating. Teachers model elements of the tool kit over time, and students practice strategies in their reading and writing.

Two studies have evaluated Pathway's effects on writing (and reading). Kim et al. (2011) and Olson et al. (2012) evaluated Pathway in a large California district with a sample that was 95% Hispanic. Outcomes across grades 6-11 were significantly positive on the California Standards Test Writing scale (ES=+0.10, p<.05) and on the Assessment of Literacy Analysis (ES=+0.48, p<.05). A second study by Olson et al. (2017), also in a large California district and also with a majority-Hispanic population (68%), found positive outcomes on the Academic Writing Assessment (ES=+0.53, p<.05). On the broader California High School Exit Exam (ES=+0.22, n.s.), there were no significant differences. The mean effect size across the two studies was +0.30 (p < .01).

Philosophy for Children (P4C) is a program designed to improve students' overall achievement by engaging them in philosophical dialogues on issues of interest to them. In England, training in Philosophy for Children is provided by an organization called SAPERE. Gorard, Siddiqui, & See (2015) carried out a one-year evaluation of Philosophy for Children in 48 elementary schools, randomly assigned to P4C or control conditions. The students were in grades 4 and 5. Outcomes were not significantly positive on standardized writing measures (ES=+0.03, n.s.).

Academic Language Instruction for All Students (ALIAS) is a vocabulary intervention designed to be used 45 minutes a day in regular English classrooms including many speakers of languages other than English. Each cycle of lessons is based on one informational text from which are extracted a small number of high-utility and abstract words on which students work deeply. The intervention includes a variety of whole-group, small-group, and independent activities, and gives opportunities for listening, speaking, reading, and writing with the targeted words. A California study mostly involving sixth-grade Spanish-speaking students found an effect size of +0.18 on written expression.

The Expository Reading and Writing Course (ERWC) is a program for 12th graders designed to prepare them to pass the California Early Placement Test (EPT), used in the California State University system to determine whether new university students must take no-credit remedial English courses or can go directly to credit-bearing English coursework.

ERWC provides curriculum materials, two days of professional development for teachers, professional learning communities, and at least four on-site coaching sessions for each teacher. The emphasis of the program is on discussion of text meaning, developing critical thinking skills, encouraging group discussions, developing oral language skills, and developing writing skills in multiple genres. ERWC replaces ordinary English classes for the 12th grade year.

A quasi-experimental clustered evaluation of ERWC was carried out by Fong, Finkelstein, Jaeger, Diaz, & Broek (2015). Using propensity matching, students in ERWC were matched on prior achievement and demographic variables with similar students in ordinary English classes. There were a total of 56 ERWC and 58 non-ERWC teachers in 24 high schools throughout California. On English Placement Test (EPT) post-tests at the end of the school year, ERWC students scored modestly higher (ES=+0.13). This difference was significant (Fong & Finkelstein, 2016).

Discussion

All categories of programs that met the inclusion criteria in this review found positive mean outcomes for students on measures of writing (as opposed to language mechanics or reading). Across all 14 studies, the weighted mean writing effect size was +0.18 ($p < .01$).

The three categories had nearly identical outcomes: Writing Process Models (ES=+0.17), Cooperative Learning (ES=+0.16), and Programs Integrating Reading and Writing (ES=+0.16) all found similar positive outcomes, on average.

Although we divided the studies into categories, many features extended across category lines. For example, both writing process and cooperative learning methods emphasized students working in partnerships, helping each other plan, draft, revise, and edit compositions in various

genres. Although writing process programs typically use peer editing, cooperative learning programs place a strong emphasis on cooperation at all stages of the writing process.

Outcomes for the three categories are not internally consistent. In the category we termed writing process models, only one study found markedly positive outcomes (Torgerson et al., 2014), while a second, much larger study (Torgerson et al., 2018) found near-zero effects, on average. Among cooperative learning approaches, Expert 21 and Student Team Writing reported particularly positive outcomes. Among programs integrating reading and writing, Pathway, ALIAS, College Ready Writer's Program, and the Expository Reading and Writing Course (ERWC) had notably positive outcomes. Positive outcomes were equally likely to be seen in upper primary, early secondary, and upper secondary year levels.

Overall, some of the key characteristics of programs that produced good writing outcomes were as follows:

- Use of cooperative learning
- Structured approaches that give students step-by-step guides to writing in various genres, focused squarely on writing outcomes
- Programs that teach students to assess their own and others' drafts, to give students more feedback and insight into effective writing strategies
- Programs that balance writing with reading
- Programs that attempt to build students' motivation to write and enjoy self-expression
- Programs that teach writing conventions (e.g., grammar, punctuation, usage) explicitly, but in the context of creative writing

- Programs that provide extensive professional development to teachers, in which they themselves experience the writing strategies they will employ

In a word, writing should be exciting, social, and noisy, but well-structured. Motivation seems to be the key. If students love to write, because their peers as well as their teachers are eager to see what they have to say, then they will write with energy and pleasure. Perhaps more than any other subject, writing demands a supportive environment, in which students want to become better writers because they love the opportunity to express themselves, and to interact in writing with valued peers and teachers.

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Table 1: Writing Process Models								
Self-Regulated Strategy Development (SRSD)/Improving Writing Quality/IPEELL								
Study	Design	Duration	N	Grade	Sample Characteristics	Posttest	Writing Effect Sizes	Writing-Related Effect Sizes
Torgerson et al (2014)	CR	2 terms	23 primary schools (11E, 12C) 261 students (142E, 119C)	Years 6-7	Low-achieving students from primary schools in West Yorkshire, England 33%FSM, 50%EAL	Progress in English (PiE Test)		
						Exended Writing Score	+0.74*	
						Reading		-0.09
						Spelling & Grammar		-0.13
Torgerson et al. (2018)	CR	1 year (Year 6)	83 schools (42E, 41C) 2465 students (1243E, 1222C)	Year 6	Schools in Leeds and Lancashire, England 20% FSM	KS 2 Writing Reading Spelling Maths	-0.09	 -0.23* -.022[a] -0.22[a]
		2 years (Years 5-6)	78 schools (40E, 38C) 2196 students (1164E, 1032C)	Years 5-6	Schools in Leeds and Lancashire, England 39% FSM	KS 2 Writing Reading Spelling Maths	+0.11	 -0.17* -0.28* -0.30*

6+1 Trait Writing Model								
Coe et al. (2011)	CR	1 year (2 cohorts)	74 schools (39E, 35C) 4161 students (2230E, 1931C)	Grade 5	Schools across Oregon	Essay	+ 0.08*	
Kozlow & Bellamy (2004)	CR	1 year	72 classrooms (35E, 37C) 1592 students (776E, 816C)	Grades 3-6	One U.S. school district with very low ELL and minority populations 10% FRL, 11% SPED	Essay	+0.04	

Key for Tables 1-3:
CQE: Cluster quasi-experimental CR: Cluster randomized; QE: Quasi-experimental; SR: Student randomized
E: Experimental; C: Control
AA: African American; A: Asian; H: Hispanic; W: White
EAL: English as an Additional Language (U.K.); ELL: English language learner (U.S.)
FSM: Free school meals (UK); FRL: Free/reduced lunch (U.S.)
SEN: Special Education Needs (UK); SPED: Special education (U.S.)
CAHSEE: California High School Exit Exam; CST: California State Test; EPT: English Placement Test
Key Stage 2: Test at the end of primary school (Year 6) (U.K.)
[a]= p<.10; *=p<.05

Table 2: Cooperative Learning								
Study	Design	Duration	N	Grade	Sample Characteristics	Posttest	Writing Effect Sizes	Writing-Related Effect Sizes
Writing Wings								
Madden et al. (2011)	CR	1 year	63 teachers (32E, 31C) 922 students (467E, 455C)	Grades 3,4	22 high-poverty schools in urban, rural, and suburban locations across 11 US states. 30% AA, 27% W, 26% H	Essay Style	+0.17	
						Ideas and Organization	+0.08	
						Mechanics		+0.12
Student Team Writing								
Stevens (2003)	CQE	1 year	5 schools (2 E, 3 C) 3986 students (1798 E, 2188 C)	Grades 6-8	High poverty, majority AA middle schools in Baltimore, MD.	Language Expression	+0.38*	
						Language Mechanics		0.00
Collaborative Strategic Reading (CSR)								
Denver Public Schools (2016)	CR	1 year	16 schools 5660 students (3101 E, 2559 C) 3 cohorts	Grades 6-8	16 middle schools in Denver, CO. 62% H, 19% W, 11% AA, 30% ELL, 11% SPED, 76% FRL.	State Test: Writing	+0.07*	
Expert 21								
Sivin-Kachala & Bialo (2012)	CR/TA	1 year	6 teachers (3 E, 3 C) 276 students (137 E, 139 C)	Grades 6-8	1 middle school in urban New Jersey. 71% H, 27% AA, 100% FRL.	State Test		
						Writing	+0.58*	
						Language &		+0.22

						Literature		

Table 3: Programs Integrating Reading and Writing								
Study	Design	Duration	N	Grade	Sample Characteristics	Posttest	Writing Effect Sizes	Writing-Related Effect Sizes
College-Ready Writers Program								
Gallagher et al. (2017)	CR	2 years	44 districts (22E, 22C) 2486 students (1259E, 1227C)	Grades 7-10	Districts across 10 US states 68% FRL, 38% Minority	Analytic Writing Continuum		
						Content	+0.20*	
						Structure	+0.20*	
						Stance	+0.15*	
						Conventions		+0.12
Pathway								
Kim et al. (2011); Olson et al. (2012)	CR	1 year (2 cohorts)	103 teachers (51 E, 52 C) 4459 students (2200 E, 2259C)	Grades 6-11	15 schools (9 middle, 6 high) from a large school district in California. Mostly mainstreamed Latino ELLs. 95% H, 88% ELL, 79% FRL.	CST Writing	+0.10*	
						Assessment of Literacy Analysis		+0.48*
Olson et al. (2017)	CR	1 year (2 cohorts)	95 teachers (49 E, 46 C) 3067 students (1467 E, 1600 C)	Grades 7-12	16 schools in Anaheim, California. 68% H, 18% A, 12% W, 20% ELL, 71% FRL.	Academic Writing Assessment	+0.53*	
						CAHSEE		+0.22
Philosophy for Children								
Gorard et al. (2015)	CR	1 year	48 schools (22E, 26C) 1529 students	Years 4, 5	Schools across England 47%FSM, 19%SEN, 27% minority, 12%EAL	Key Stage 2 Writing	+0.03	

			(722E, 757C)					
Academic Language Instruction for All Students (ALIAS)								
Lesaux et al. (2014)	CR	20 weeks	50 teachers (25 E, 25 C) 746 students (357E, 389C)	Grade 6	14 urban middle schools in a large urban school district, California. 71% ELL, mainly Spanish speaking.	Written Expression	+0.18*	
Expository Reading and Writing Course (ERWC)								
Fong et al. (2015)	QE	1 year	6618 students (3309 E, 3309 C)	Grade 12	24 schools across California (15 urban, 3 rural, and 6 suburban). 45% H, 27% A, 24% W.	English Placement Test (EPT)	+0.13*	