

Dual Language Programs

Intervention Report | English Language Arts Topic Area

WHAT WORKS
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Providing instruction in multiple languages has the potential to simultaneously help both native English speakers and English learners to develop language proficiency. *Dual language programs* can help native English speakers develop proficiency in a second language and English learners develop proficiency in both their native language and English. Typically in *dual language programs*, classroom teachers instruct students from an early age and over multiple years in both English and a second language called the partner language. These programs vary widely by partner language, primary language of the student population, and duration. Because reaching proficiency in a second language may require substantial exposure over an extended period of time, this report examines *dual language programs* that (1) span at least the elementary grades; and (2) provide at least 50 percent of instruction in the partner language.

Goal: *Dual language programs* aim to promote academic achievement, bilingualism and biliteracy, and awareness and appreciation of diverse cultures.

Target population: *Dual language programs* can be used in grades PK-12 and are most commonly implemented in K-5 or K-8. *Dual language programs* can be used with both English learners and native English speakers.

The What Works Clearinghouse (WWC) reviews existing research on educational interventions to identify evidence-based programs and practices. This WWC intervention report summarizes the available evidence on the effects of *dual language programs* on student outcomes.

Did dual language programs improve student outcomes?

Out of the 45 studies reviewed by the WWC for this report, only two studies of *dual language programs* meet WWC standards, and 43 studies did not meet WWC standards and therefore are not summarized in this report. Therefore, the effects of *dual language programs* implemented in most settings are unknown, and more rigorous research is needed to determine program effects across different student populations, partner languages, and program models.

Findings from the two studies that meet WWC standards are summarized in Table 1. The table includes rows for each outcome domain—a group of related outcome measures—that was studied in the research. Effects of *dual language programs* on other student outcomes are unknown. Table 1 indicates whether the evidence satisfies the WWC’s requirements for strong, moderate, or promising tiers of evidence. Based on one study, there is moderate evidence that the *dual language programs* positively impacted student literacy achievement in English.

The WWC effectiveness rating indicates whether *dual language programs* resulted in improved outcomes for students who participated in the program compared with students who did not. More information about these ratings and requirements is provided on the next page. Findings and conclusions could change as new research becomes available.

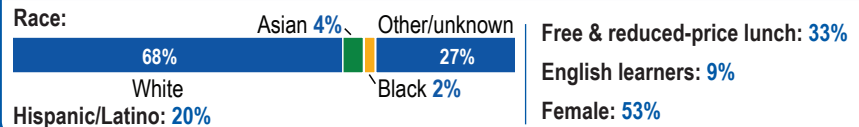
Table 1. Summary of findings on *dual language programs* from studies that meet WWC standards

Outcome domain	Effectiveness rating	Sample size	Evidence tier	Summary
Literacy achievement	Potentially positive effects	844 students	TIER 2 MODERATE	One study provides strong evidence that <i>dual language programs</i> improved student literacy achievement. Because this assessment is based on only one study that meets WWC standards, the WWC effectiveness rating is potentially positive effects.
Science achievement	Uncertain effects	814 students	NO TIER ASSIGNED	The research does not support claims that <i>dual language programs</i> improved student science achievement. This assessment is based on one study that meets WWC standards.
Mathematics achievement	Uncertain effects	3,133 students	NO TIER ASSIGNED	The research does not support claims that <i>dual language programs</i> improved student mathematics achievement. This assessment is based on two studies that meet WWC standards.

FINDINGS FROM 2 STUDIES

3,133 students in Oregon and Utah.

STUDENTS IN GRADES K–8



HOW THE WWC REVIEWS AND SUMMARIZES EVIDENCE

The WWC conducted a systematic review of interventions designed to improve students' academic achievement and selected and prioritized studies for review using the version 4.1 [Systematic Review Protocol for English language arts interventions](#). The WWC evaluated the quality and results of the selected studies using the criteria outlined in the version 4.1 [Procedures and Standards Handbooks](#) and the accompanying [Study Review Protocol](#).

The WWC considers each study's research design, whether findings were statistically significant and positive, and the number of studies contributing to this report. The WWC synthesizes evidence across studies—using a weighted average—to determine the effectiveness rating for each outcome domain. The WWC defines outcome domains in the [Study Review Protocol](#) to group related outcome measures.

Effectiveness rating	Description of the evidence
Positive (or negative) effects	The evidence base primarily includes the strongest research designs, and the average effect across all high-quality research is statistically significant and positive (or negative).
Potentially positive (or negative) effects	The evidence base primarily includes research with some limitations, and the average effect across all high-quality research is statistically significant and positive (or negative).
Uncertain effects	The average effect across all high-quality research is not statistically significant, so the WWC does not classify it as a positive or a negative effect.

The WWC considers the effectiveness rating, the sample size, and the number of educational sites (states, school districts, local education agencies, schools, postsecondary campuses) across studies to determine the evidence tier for each outcome domain. When the effectiveness rating is *uncertain*, *potentially negative*, or *negative effects*, there is no evidence tier.

Effectiveness tier	Criteria based on evidence synthesis	
Strong evidence of effectiveness	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TIER 1 STRONG </div>	<ul style="list-style-type: none"> • Receives an effectiveness rating of positive effects, and • Includes at least 350 students in at least two educational sites
Moderate evidence of effectiveness	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TIER 2 MODERATE </div>	<ul style="list-style-type: none"> • Receives an effectiveness rating of potentially positive effects, and • Includes at least 350 students in at least two educational sites
Promising evidence of effectiveness	<div style="border: 1px solid black; padding: 5px; text-align: center;"> TIER 3 PROMISING </div>	<ul style="list-style-type: none"> • Receives an effectiveness rating of potentially positive effects or positive effects • Includes fewer than 350 students or two educational sites

How were dual language programs implemented?

This section provides details of how school districts and schools implemented *dual language programs* in the two studies that contribute to this intervention report. This information can help educators identify the requirements for implementing *dual language programs* and determine whether implementing this intervention would be feasible in their school districts or schools.

Dual language programs are also referred to by other names, such as dual language immersion, dual language bilingual, or one- or two-way immersion programs. *Dual language programs* can be implemented with students from one language group (in one-way programs) or with students from two language groups (in two-way programs). For example, a school with all native English speakers could implement a Japanese one-way program in which the native English speakers also learn Japanese. Another school that includes both native English speakers and native Spanish speakers could implement a two-way program in which both groups of students are instructed in both English and Spanish.

Comparison condition: In the two studies that contribute to this intervention report, students in the comparison group attended schools with regular instructional programs in English only in the same school district or state.

Dual language programs can vary in duration and be implemented either schoolwide or as a strand within a school. In the strand within a school approach, some, but not all classrooms at each grade level implement the program. Programs that start with a higher percentage of instructional time in the partner language than in English reduce the amount of instructional time in the partner language at each grade level, moving toward 50% of instructional time in each language by about grade 4. Participating students in *dual language programs* receive the program every day continuously across multiple school years.

Both studies that meet WWC standards in this report implemented one-way and two-way programs. In one study, schools included in the sample implemented nine one-way programs in Japanese, Mandarin, and Spanish and 13 two-way programs in Russian and Spanish in elementary and middle schools. In the other study, schools implemented 17 one-way programs in Chinese, French, and Spanish and nine two-way programs in Spanish in elementary schools. Table 2 describes the components and implementation of the *dual language programs* in the two studies highlighted in this report.

WWC standards assess the quality of the research, not the quality of the implementation. Studies that meet WWC standards vary in quality of implementation. However, a study must describe the relevant components of the intervention and how each was implemented with adequate detail to be included in an intervention report.

Table 2. Implementation of components of *dual language programs*

Component	Description of the component	How it was implemented
Program leadership and support	<p>Schools establish a school leadership team consisting of teachers and administrative staff that is responsible for selecting the type of <i>dual language program</i> they will implement, advocating for the program, overseeing the implementation of the model and its ongoing development and evaluation, including staff development.</p> <p>The school district or state helps select a <i>dual language program</i> model, sets goals for the program, provides training and technical support to the school leadership team, and provides funding for purchasing or developing curriculum and assessment materials.</p>	<p>One study does not provide information on how the schools were supported. In the other study, the state board of education provided guidelines and tools for ensuring fidelity of implementation to the state's dual language immersion model. A state advisory council, including principals and school district administrators, met regularly.</p> <p>Neither study provides specific information about the implementation of the school leadership team.</p>
Hiring and training linguistically and culturally competent teachers in both languages	<p>Schools may need to hire additional teachers who are fluent in the partner language and provide training and support to all teachers on how to deliver instruction in two languages. In addition to certification in their given content area, teachers must be trained on how students develop bilingualism and biliteracy and, especially for two-way programs, learn how to incorporate student cultural and linguistic backgrounds into instruction. Not all teachers need to be bilingual, but they must all be committed to the goals of bilingualism and biliteracy.</p>	<p>Principals in one study worked with the school district to recruit and hire additional teachers who were proficient in the partner languages.</p> <p>In the other study, school districts hired guest teachers on a temporary basis as partner language teachers.</p>
Aligned curriculum, assessments, and instruction in both languages	<p>Schools develop or purchase an enriched curriculum across the two languages that is culturally responsive and representative of all students and promotes equal status of both languages and appreciation for multiculturalism and linguistic diversity. Schools develop or adopt a scope and sequence and ensure alignment of the curriculum across subjects and grades in both languages. Ongoing and year-end assessments are aligned with the curriculum to enable continual student and program evaluation in both languages. Instruction is aligned with standards, is developmentally appropriate, and provides opportunities to develop higher-order thinking skills. Language objectives are incorporated into content area instruction to promote the development of academic language that is required for success in school.</p>	<p>In one study, the school district ensured that curricula were available in the partner languages for all grades and content areas needed.</p> <p>In the other study, the state developed a curriculum aligned with the Common Core standards that is designed to promote literacy in both languages and meet established English and partner language proficiency targets in all grades. The state also developed lesson plans and translated academic content curricula and materials for math, social sciences, and science for all partner languages.</p>

Note: The descriptive information for this intervention comes from the two studies that meet WWC standards, the Utah State Board of Education website (<https://www.schools.utah.gov/curr/dualimmersion?mid=5560&tid=2>), Portland Public Schools website (<https://www.pps.net/Page/269>), and from correspondence with a content expert.

How much do *dual language programs* cost?

This section provides educators with an overview of the resources needed to implement *dual language programs*. The costs of implementing *dual language programs* vary. Steele et al. (2018) report that the cost of implementing *dual language programs* in their study was about 2% to 4% of per-pupil spending annually and incurred primarily by the school district. Other studies have estimated costs for *dual language programs* from 7% to 12% of per-pupil spending. Table 3 describes the major resources needed for implementation and approximate costs, based on information available as of June 2018.

Table 3. Resources needed to implement *dual language programs*

Resource	Description	Funding source
Personnel	These costs include resources for additional administrative and instructional staff who may be needed to implement <i>dual language programs</i> , and training and professional development that focuses on the unique context of <i>dual language programs</i> . Teachers may also need additional time for translating English materials into the partner language and appropriately adapting school district instructional plans and initiatives that were not specifically designed to be used in <i>dual language programs</i> .	School districts or schools cover costs for additional staff and provide training and professional development.
Facilities	The program is delivered in a classroom setting during regular class time.	School districts or schools provide the classroom facilities.
Equipment and materials	The costs of curricular and instructional materials in the partner language, such as textbooks and assessments, can vary widely.	School districts or schools usually purchase materials, textbooks, and assessments in the partner language and English, as necessary.

For more information about the cost of *dual language programs*

Lara-Alecio, R., Galloway, M., Mason, B., Irby, B. J., & Brown, G. (2004). *Texas dual language program cost analysis*. Texas A&M University.

Parrish, T. B. (1994). A cost analysis of alternative instructional models for limited English proficient students in California. *Journal of Education Finance*, 19, 256–278.

Steele, J. L., Slater, R. O., Li, J., Zamarro, G., Miller, T., & Bacon, M. (2018). Dual-language immersion education at scale: An analysis of program costs, mechanisms, and moderators. *Educational Evaluation and Policy Analysis*, 40(3), 420–445.

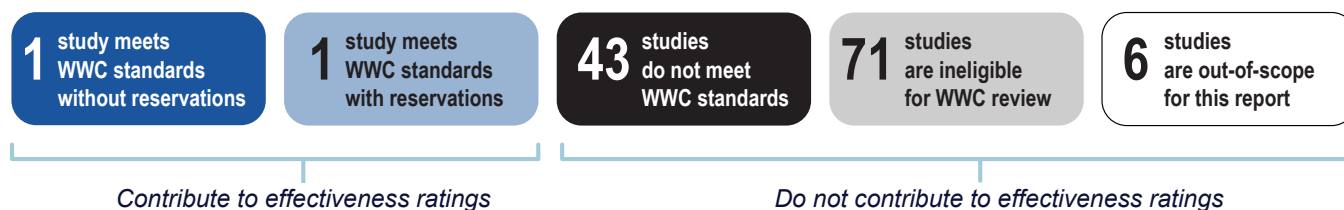
What research did the WWC review about *dual language programs*?

This section provides details about the studies of *dual language programs* that the WWC identified in its systematic review. This section summarizes all of the studies reviewed by the WWC for this intervention report and the findings and characteristics of the two studies that meet WWC standards.

The quality of the available research about *dual language programs*

The WWC identified 122 studies that investigated the effectiveness of *dual language programs* from a literature search in the Education Resources Information Center (ERIC) and other databases in February 2020. Of these 122 studies, two meet WWC standards and contribute to the summary of evidence in this intervention report. Studies that do not meet WWC standards, are ineligible for review, or are out of scope of this systematic review do not contribute to this intervention report (Figure 1).

Figure 1. Two of 122 studies identified in the literature search are eligible and meet WWC standards



- **One study meets WWC standards without reservations.** The study is a low-attrition randomized controlled trial. The WWC does not have any reservations about the quality of this study.
- **One study meets WWC standards with reservations.** The study is a quasi-experimental design that analyzes intervention and comparison groups that appeared similar before introducing the intervention. The WWC has some reservations about the quality of the study because of limitations in the research design.
- **Forty-three studies do not meet WWC standards.** Thirteen of these studies are quasi-experimental designs that do not satisfy the baseline equivalence requirement either because the study does not report on a required baseline measure or the differences between intervention and comparison groups are considered too large. Nineteen other studies are randomized controlled trials with high attrition that also do not satisfy the baseline equivalence requirement. Eleven studies do not meet standards because each includes a confounding factor so that the measures of effectiveness cannot be attributed solely to the introduction of *dual language programs*. For example, in one study, all students of teachers who participated in *dual language programs* were in a single school, while students in the comparison group were in other schools. Therefore, it was not possible to isolate the effectiveness of the intervention from the effectiveness of the school.
- **Seventy-one studies are ineligible for review.** These studies are typically ineligible for review because they do not use a study design eligible for review as described in the [WWC Standards Handbook \(Version 4.1\)](#). Typically, these study designs lack a comparison group.
- **Six studies are out of scope of this systematic review.** The interventions in these studies did not implement one or more of the key features of *dual language programs* as defined in this report. Specifically, three of these studies focus on stand-alone preschool programs that did not span the elementary grades, and three focus on interventions that did not provide instruction in the partner language at least 50% of the time at each grade level.

The citations for these five groups of studies are included in the references. For information on how the WWC determines study ratings, see the version 4.1 [Procedures and Standards Handbooks](#), [WWC Standards Briefs](#), and the [Study Review Protocol](#), available on the WWC website.

More details about the two studies of *dual language programs* that meet WWC standards

The two studies that meet WWC standards examined the effects of *dual language programs* on standardized tests of literacy, science, and mathematics. Table 4 lists, for each finding, the name of the outcome measure, when it was assessed, the sample size and number of educational sites, the means and standard deviations in the *dual language programs* and comparison groups, the effect size, the improvement index, and whether the WWC determined the finding to be statistically significant. Table 5 provides more contextual information about the two studies of *dual language programs* that meet WWC standards, including the study setting and participants.

The WWC also reviewed supplemental findings in these studies, such as for subgroups of students at later time periods and in different grade spans, and for both English learners and native English speakers. While Steele et al., (2017) found positive effects of *dual language programs* on literacy achievement for the full student sample, the study found insignificant findings on literacy achievement for English learners. And, similar to the full sample findings, Steele et al. (2017) also found insignificant findings for the English learner sample on science and mathematics achievement. Findings for English learners in the Watzinger-Tharp et al. (2018) study did not meet WWC standards. The supplemental findings do not factor into the intervention's rating of effectiveness but can be viewed on the WWC website (<https://ies.ed.gov/ncee/wwc/ReviewedStudies/>). Links to each WWC study page are provided in the References. Other study findings that are not reported on the WWC website were either ineligible for review or did not meet WWC standards.

What is an effect size? The effect size is a standardized measure of the impact of an intervention that can be synthesized across outcome measures and studies. A positive effect size favors the intervention group, and a negative effect size favors the comparison group. Effect sizes further away from 0 means there was a larger difference between the groups.

What is an improvement index? The improvement index is another measure of the intervention's impact on an outcome. The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +5 means that a comparison group student at the 50th percentile would have scored at the 55th percentile if the student had received the intervention. The effect size and improvement index measure the same concept in different units, similar to meters and feet for distance.

What is statistical significance? A finding is statistically significant if the difference between the intervention and comparison group means was large enough that it is unlikely to have been obtained for an intervention without a true impact. The WWC considers *p*-values less than 0.05 to be statistically significant.

Table 4. Findings by outcome domain from two studies of *dual language programs* that meet WWC standards

Outcome	Timing of measurement and study	Study sample	Number of sites	Mean (standard deviation)		Findings		
				Intervention group	Comparison group	Effect size	Improvement index	Statistically significant (p-value)
Literacy achievement outcome domain								
Oregon Assessment of Knowledge and Skills	End of 6 years of implementation (Steele et al., 2017)	844 students in grade 5	Multiple schools in Portland, Oregon			0.14	+5	Yes (p=0.02)
Summary for literacy achievement: potentially positive effects						0.14	+5	Yes (p=0.02)
Science achievement outcome domain								
Oregon Assessment of Knowledge and Skills	End of 6 years of implementation (Steele et al., 2017)	814 students in grade 5	Multiple schools in Portland, Oregon			0.09	+4	No (p=0.18)
Summary for science achievement: uncertain effects						0.09	+4	No (p=0.18)
Mathematics achievement outcome domain								
Oregon Assessment of Knowledge and Skills	End of 6 years of implementation (Steele et al., 2017)	846 students in grade 5	Multiple schools in Portland, Oregon			0.08	+3	No (p=0.18)
Criterion Reference Test Math	End of 4 years of implementation (Watzinger-Tharp et al., 2018)	2,287 students in grade 4	Multiple schools in Utah	171.33 (11.24)	170.71 (10.80)	0.06	+2	No (p=0.67)
Summary for mathematics achievement: uncertain effects						0.07	+3	No (p=0.17)

Note: The intervention and comparison group means and standard deviations are not displayed for some findings in the table because they were not reported in units that can be compared to scores on the same measures in other samples or settings.

Table 5. Characteristics of the two studies of *dual language programs* that meet WWC standards

Characteristic	Steele et al. (2017)	Watzinger-Tharp et al. (2018)
What was the study design?	The study used a randomized controlled trial to compare students who were offered a spot in a <i>dual language program</i> to students who applied but were not offered a spot. The random assignment was based on an existing lottery process the district uses to offer dual language immersion to kindergarten student applicants.	The study used a cluster quasi-experimental design. The authors used matching methods to select comparison students from other schools who were similar to the students in <i>dual language programs</i> . The analysis focuses on students in grade 4 who had been in their school since grade 1.
What was the WWC study rating?	The study is rated Meets WWC Group Design Standards Without Reservations because it is a randomized controlled trial with low attrition.	The study is rated Meets WWC Group Design Standards With Reservations because it is a quasi-experimental study that satisfies the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups.
Where did the study occur?	The study took place in schools in the Portland Public School district. The study followed students from kindergarten through grade 8. The intervention was provided in 11 elementary schools and six middle schools. There were 26 comparison schools in the study.	The study took place in schools in Utah with students in grade 1 through grade 4. The intervention was provided in 26 elementary schools. There were 26 comparison schools in the study.
Who participated in the study?	This study included seven cohorts of students entering kindergarten and followed cohorts for 8 years. The main findings for this report focus on outcomes up to grade 5 because all cohorts were represented in this sample, but findings for later grades are available on the WWC study webpage. The total number of grade 5 students for both the intervention and comparison group was 844 students for the literacy outcome, 814 students for the science outcome, and 846 students for the mathematics outcome. Approximately 54% of the kindergarten students were non-Hispanic White, 17% were Hispanic or Latino, 14% were Asian, 6% were Black, and 1% were other races. Approximately 47% of the students were male, 26% were eligible for free or reduced-price lunch, 13% were English learners, and 4% were identified as needing special education services in kindergarten.	The study included a total of 2,287 students. Seventy-three percent of students were non-Hispanic White and 21% were Hispanic or Latino. Thirty-five percent were eligible for free or reduced-price lunch, and 7% were English learners.

Recommended Citation

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References

Study that meets WWC standards without reservations

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Study that meets WWC standards with reservations

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Additional sources

The WWC examined additional sources (such as preliminary reports, working papers, or other associated publications) related to the citations in the references to complete its review of these studies. The additional sources are listed on the WWC webpages for each study review.