

Impact of bilingual education on student achievement

Language development programs should focus on quality rather than the language in which instruction is provided

Keywords: bilingual education, language of instruction, English as a second language, structured English immersion, limited English proficient students, English language learners

ELEVATOR PITCH

More than 4.4 million students enrolled in US public schools participate in English language learner programs because of linguistic barriers to learning in regular classrooms. Whether native language instruction should be used in these programs is a contentious issue. Recent studies, using credible research designs for estimating causal impacts, find that bilingual education programs (which use some native language instruction) and English-only programs are not significantly different in their impact on standardized test performance. This finding suggests that it is time to change the focus from use of the native language to program quality.

KEY FINDINGS

Pros

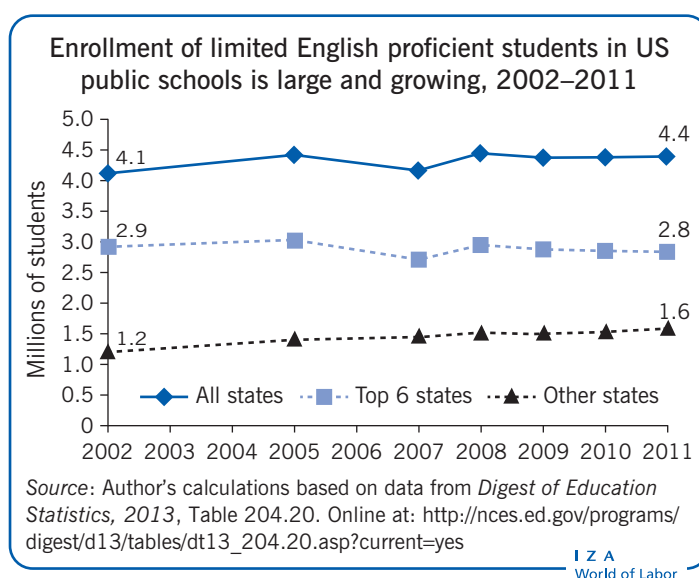
- ⊕ Bilingual education may help limited English proficient students keep up in other subjects while they learn English.
- ⊕ Bilingual education helps limited English proficient students develop language skills in their native (non-English) language.
- ⊕ Skills in students' native language may facilitate their development of skills in English.
- ⊕ Bilingual education supports cultural inclusion and diversity.

Cons

- ⊖ By reducing exposure to English, bilingual education may slow the acquisition of English language skills.
- ⊖ A shortage of certified bilingual education teachers makes it difficult to implement bilingual education programs as intended.
- ⊖ Appropriate teaching and learning materials may not be available in all native languages.
- ⊖ Bilingual education segregates limited English proficient students from other students, which may have social and academic impacts.

AUTHOR'S MAIN MESSAGE

Discussions about how to educate limited English proficient students often focus on the language of instruction. However, convincing recent evidence that bilingual education programs and English-only programs in US public schools are similarly effective in their impacts on student achievement suggests that it could be more productive to shift the focus from the language of instruction to the quality of instruction. Instruction should be of adequate intensity, provided by teachers qualified to teach limited English proficient students, and supported by appropriate teaching and learning materials, regardless of the language of instruction.



MOTIVATION

Many children attend schools that teach in a language in which they are not proficient, and this trend is growing due to rising international migration. Linguistic barriers to learning in regular classrooms put these students at risk of poor education outcomes. A variety of education programs are proposed to improve outcomes. Evidence on their effectiveness can guide parents, educators, and policymakers. The US has many limited English proficient students, and several rigorous evaluations of bilingual education exist for US programs, which is why the US is the focus here.

Enrollment of limited English proficient students in US public elementary and secondary schools (as measured by number of students participating in English language learner programs) reached 4.4 million in 2011/2012, or 9% of total enrollment, and is growing much faster (6.6% between 2002/2003 and 2011/2012) than enrollment of other students (2.4%). Enrollment was flat in California, Texas, Florida, New York, Illinois, and Arizona (the top six states by number of limited English proficient students) but grew 29% in the other states over the decade, reflecting the increasing geographic dispersion of immigrants. In 2011/2012, 74% of US public schools had at least one limited English proficient student. Many schools are making decisions about how to educate their limited English proficient students.

DISCUSSION OF PROS AND CONS

Scores on the grade 4 mathematics test on the National Assessment of Educational Progress (the largest nationally representative assessment of what American students know) show a persistent achievement gap between limited English proficient students and other students (Figure 1). At 25 points, the gap is large (0.8 standard deviations) and greater than the gap between poor and non-poor students. Other measures of academic performance show a similar gap. Lower test scores indicate that limited English proficient students are less proficient in core academic skills, which may make later classes more difficult, cause placement in less rigorous tracks of study, and raise dropout rates, lowering eventual educational attainment and human capital.

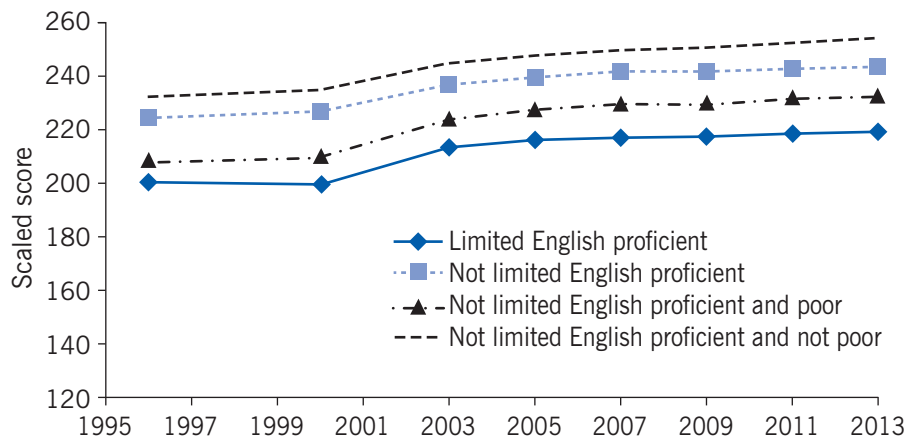
Because lack of proficiency in English is a barrier to learning in regular classrooms, US civil rights laws require schools to offer additional instructional services to limited English proficient students. Programs fall into two broad categories: those that use the student's native language for at least some of the instruction (bilingual education), and those that use only English for instruction. As the emphasis of all these programs is English language development, both programs devote time to this, typically using English as a second language (ESL) methods. Also, there is considerable variation in how much the native language is used in bilingual education programs. Thus, the contrast between bilingual education programs and English-only programs is less stark in practice than in theory.

Potential effects of bilingual education on student outcomes

Potential benefits of bilingual education

When limited English proficient students are still learning English, it may be better to teach other subjects in their primary language. To the extent that the course content

Figure 1. Grade 4 mathematics performance on the National Assessment of Educational Progress, by limited English proficient and low-income status



Note: Poor students are defined as those who are eligible for the National School Lunch Program.

Source: Author's calculations based on data from National Center for Education Statistics, National Assessment of Educational Progress Mathematics Assessments, various years.

Online at: <http://nces.ed.gov/nationsreportcard/naepdata/>

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is more accessible when taught in the native language, limited English proficient students will not fall (as far) behind in these other subjects while they are catching up in English.

Receiving instruction at school in the native language may also improve students' skills in their native language. Additionally, parents of limited English proficient students, who themselves typically lack proficiency in English, may be better able to assess their children's school progress, help with schoolwork, and communicate with teachers in a bilingual education setting.

Instruction in the native language might develop general language skills that facilitate learning new languages. For example, some strategies developed for reading in the native language may be applicable for reading in English.

Potential drawbacks of bilingual education

Because some instruction is in the native language, bilingual education students receive less exposure to English at school than students in English-only programs. This might delay and weaken their acquisition of English language skills, which could in turn affect the academic tracks they can pursue later.

Sometimes the inputs needed for bilingual education programs are not available. First, it is difficult to recruit enough certified bilingual education teachers for some districts, languages, and grades. While teaching in English-only programs also requires special training, there is a larger pool of candidates since proficiency in a non-English language is not necessary. Second, teaching and learning materials are not available in many native languages, subjects, and grades. Thus, implementing bilingual education programs as intended becomes more difficult.

Because bilingual education programs provide some content instruction in the native language, limited English proficient students with the same native language and in

the same grade tend to be grouped together in self-contained classrooms, unlike in most English-only programs. On average therefore, limited English proficient students placed in bilingual education programs have less exposure to other students as well as to limited English proficient students of other native languages, and there could be peer effects associated with this.

Who receives bilingual education?

Although more than 200 home languages are reported among limited English proficient students in US public schools, in practice bilingual education programs are available only for a few languages, with Spanish–English programs by far the most common. This is primarily because Spanish-speaking limited English proficient students are the most numerous (they made up 77% of limited English proficient students in 2001/2002; the next largest group was Vietnamese speakers, at 2.4%) [1]. Moreover, Spanish-speaking limited English proficient students are more likely than other limited English proficient students to be placed in bilingual education programs: 38% compared with 17% [1].

This highlights that student placement in bilingual education is not random. Whether a student participates in bilingual education depends on many variables, including characteristics of the student (such as home language, grade, English proficiency), parents (such as income, education, whether they take up the program if it is offered to their child), neighborhood (such as community preference for bilingual education, having enough limited English proficient students with the same native language and in the same grade), and state (some states mandate bilingual education while some ban it). Researchers do not have data on all the variables that affect participation, and because some of these variables also affect student achievement, conventional estimates of participation in bilingual education will suffer from omitted variables bias. Besides the problem of non-random selection into bilingual education, there are also complications in measuring education outcomes for limited English proficient students. Thus, estimating the causal impact of bilingual education on student achievement is a challenge.

Empirical evidence on the impacts of bilingual education

Studies can be cited to support either side of the debate on whether bilingual education programs work better than English-only programs; early meta-studies are [2], [3]. Many of the studies fail to deal with the non-random selection of limited English proficient students into bilingual education programs. Students who participate in bilingual education are systematically different in observed and unobserved characteristics from students who do not, so the achievement difference between participants and non-participants could not be causally attributed to bilingual education. In addition, some of the studies are limited in sample size or several decades old. In the past few years, however, several large-scale studies have used experimental or quasi-experimental methods to obtain convincing estimates of causal impact.

Evidence from a recent randomized experiment

A recent study that randomly assigned limited English proficient kindergartners in six schools to bilingual education or structured English immersion finds no statistically

Data challenges in measuring the education performance of limited English proficient students

High-performing students exit limited English proficient status sooner. Students are placed in mainstream classes when their academic performance is sufficiently high. Thus, the achievement gap with other students can be expected to widen over time as better performing students exit and lower performing students remain in the sample. With access to student longitudinal data, researchers can determine whether a student has ever been in limited English proficient status and not have to rely on the current limited English proficient status.

Limited English proficient students are more likely to drop out of school than other students, and lower performing students are even more likely to drop out, so the measured achievement of limited English proficient students in upper grades may overestimate the true performance of that cohort. Ideally, researchers should examine dropout behavior along with test performance.

Under federal law, *limited English proficient students can be exempted from state assessments in their first year of enrollment and in later years can be offered test accommodations* (such as taking content tests in their native language). Thus, researchers measuring student performance using scores on standardized exams should consider potential selection into the exam pool and the comparability of exams administered in different languages.

Population surveys include data on limited English proficient individuals who never attended US schools. Data from nationally representative surveys of the US population can be used to examine adult outcomes (such as educational attainment and wages). Many limited English proficient adults in these data sets are migrants who arrived in their teens and later and never attended US schools, which limits the ability to link education or wage gaps observed in these data to US school policies.

significant differences in English skills by grade 4 as measured on standardized tests [4]. In earlier grades, though, difference in English test scores between students in the two programs were larger and sometimes statistically significant. In grade 1, the deficits for bilingual education students were over one-third of a standard deviation and statistically significant. By grades 2 and 3, the deficits had diminished, and only two of the eight scores (four for each grade) were statistically significant. On the other hand, in all four grades, students randomly assigned to bilingual education had significantly better performance on the tests measuring Spanish skills.

The treatment effects, estimated as far out as five years after the randomization of treatment status, are not confounded by attrition bias as the attrition rate, and the baseline test scores of those who left the study, did not differ significantly between students in bilingual education and those in structured English immersion. Thus, although students in bilingual education initially had worse English skills than students in structured English immersion programs, their later English skills did not differ significantly [4].

These estimates of the causal impact of bilingual education relative to structured English immersion have internal validity, but external validity is limited by the small number of students and schools. Thus, it is of interest to look at studies covering more students and in other contexts.

Evidence from analyses of the impact of policy changes

The official evaluation of Proposition 227, a California voter referendum banning bilingual education, finds that the share of limited English proficient students receiving bilingual education dropped from 30% in 1997/1998 (the last year before implementation) to 8% in 2003/2004, with limited English proficient students shifting to structured English immersion programs [5]. A comparison of the change in mathematics and reading test scores for limited English proficient students with the change for students who had never been identified as limited English proficient (difference-in-differences analysis) finds a small, statistically insignificant change in the gap between the groups.

Under the assumption that in the absence of the policy change, the gap would have been unchanged, this finding suggests that bilingual programs are as effective as English-only programs for limited English proficient students. However, the authors point out that there were other policy changes around the same time that might make the assumption less plausible, including changes in national accountability standards (such as fewer exemptions from state assessments) and the introduction of the California English Language Development Test in fall 2001 to measure the English proficiency of limited English proficient students. It is likely that these other policy changes affected limited English proficient students and other students differently, making it difficult to disentangle the effect of Proposition 227 from these other changes using a difference-in-differences method with non-limited English proficient students as a comparison group.

Two other studies also use Proposition 227 to learn about the effect of bilingual education, but with a different comparison group. Their insight is that schools in California with a higher prevalence of bilingual education before Proposition 227 would have to move a larger share of limited English proficient students out of bilingual education to comply with the ban on bilingual education than would schools with lower prevalence. Comparing changes over time for limited English proficient students in schools with higher pre-policy prevalence to changes in schools with lower prevalence gives an alternative difference-in-differences estimate of the impact of a reduction in bilingual education. Since this analysis uses data on limited English proficient students only, other policies that differentially affect limited English proficient students are controlled for (because everyone, even the comparison group, is exposed to them).

One study using 1990 and 2000 US Census microdata finds that Proposition 227 increased the self-reported English-speaking ability of children aged 5–18 who immigrated to the US within the past three years from a non-English-speaking country, who are likely to be placed in programs for limited English proficient students [6]. The post-policy year of 2000 is only two years after Proposition 227 was implemented, so the finding is consistent with English speaking ability developing faster when children are placed in structured English immersion instead of bilingual education programs. Left unanswered are impacts on academic English skills and longer-term English language skills.

The other study uses scores from the California English Language Development Test, a richer measure of English proficiency [7]. Because these scores were available beginning only in 2001, there are no pre-policy data; however, the broad intuition

behind the empirical strategy is similar. It uses the change in a school's bilingual education prevalence predicted by perfect compliance with Proposition 227 as an instrumental variable for a student's actual participation status in bilingual education and controls for a rich set of school characteristics to address the concern that schools with higher and lower pre-policy bilingual education prevalence rates differ systematically. For Spanish-speaking limited English proficient students in grades 1 and 2, bilingual education, relative to English-only approaches, has significant large negative associations with English listening and speaking proficiencies, but the associations are small and positive in grades 3–5 (and insignificant in grade 5). English reading and writing proficiencies are measured in higher grades, and there is no evidence of significant differences in grade 5, with mixed results in grades 3–4.

Instrumental variable approach

Ordinary least squares estimates of the effect of an intervention on the dependent variable may not have a causal interpretation due to such concerns as omitted variables bias and reverse causality. If there is a variable that is both correlated with the intervention variable and affects the dependent variable only through the intervention variable, this variable can serve as an instrumental variable. It can be used in place of the intervention variable to estimate the local average treatment effect (local to individuals whose intervention status is affected by the instrument).

Massachusetts voters passed a similar initiative banning bilingual education beginning in 2003/2004. A difference-in-differences analysis compares the cohort difference (between the post-policy cohort that took the grade 3 Massachusetts Comprehensive Assessment System exam in spring 2006 and the pre-policy cohort that took the exam in spring 2003) for limited English proficient students with the cohort difference for students who had never been identified as limited English proficient students [8]. The study finds small, statistically insignificant differences in reading scores. The finding of no effect of the policy reducing bilingual education holds for both Spanish-speaking and other native language-speaking limited English proficient students.

Evidence using policy rules

Texas requires school districts to offer bilingual education when 20 or more limited English proficient students are enrolled in a particular grade and speak the same native language. A study using a regression discontinuity design exploiting this policy rule finds no statistically significant difference in state standardized mathematics and reading test scores for grade 3–5 students whose native language is Spanish in districts that are above the 20-student cutoff (more likely to be exposed to bilingual education) and those in districts that are below the cutoff (more likely to receive only ESL instruction) [9]. Since most of these students would have been limited English proficient students in an earlier grade, this finding suggests that bilingual education programs and ESL programs, as implemented in small, less urban schools in Texas, have similar impacts on later student achievement. However, these effects of bilingual education may not necessarily generalize to larger, more urban districts or to limited English proficient students whose native language is not Spanish.

Regression discontinuity design

When a policy specifies cutoffs for determining eligibility for an intervention, a regression discontinuity design can be used to estimate the causal impact of the intervention. Suppose assignment to an intervention is made if an underlying variable exceeds some threshold value. Individuals just above and just below the threshold are expected to be the same in all ways except for the intervention. Comparing outcomes for those above and below the threshold gives an estimate of the local average treatment effect (local to individuals near the threshold).

A study in a large north-eastern urban district also uses a regression discontinuity design to estimate the effect of bilingual education [10]. It finds little difference in achievement between students who scored just below the English skills assessment cutoff (and are eligible to participate in bilingual education or ESL programs according to the district policy rule) and those who scored just above (ineligible and placed in mainstream classrooms) [9]. Thus, instruction that uses some native language is no more effective than the all-English instruction occurring in mainstream classrooms. Because the study focuses on students near the cutoff score, the results for the impact of limited English proficient programs apply only to the most English-proficient among limited English proficient students.

Evidence outside the US

A few studies estimate the effect of changes in language of instruction policies. In Morocco, a reform that changed instruction from Arabic in grades 1–5 and French in grades 6–12 to Arabic only is found to decrease French writing skills but not to affect French reading, Arabic, and mathematics skills [11]. In Latvia, a reform that changed instruction from Russian only to 60% Latvian and 40% Russian in secondary schools lowered the high school exit exam scores of ethnic Russians [12]. In South Africa, instruction is in the native language in early grades, and English or Afrikaans in later grades, and a reform increasing the grades providing native language instruction has led to higher literacy and educational attainment [13]. These studies emphasize that school quality changes are coupled with the changes in the language of instruction, and all the studies find that student outcomes are better when quality is higher (which is sometimes with native language instruction and sometimes not).

LIMITATIONS AND GAPS

There are several limitations and gaps in the work evaluating US bilingual education programs. The studies discussed here reflect mainly the impacts of transitional bilingual programs, the most common type in the US. However, their impacts may well differ from those of programs that have bilingualism as a goal, such as maintenance bilingual education and dual language immersion programs.

The literature focuses on English language skills and standardized test scores in English and mathematics as outcomes. These are important in that the main goal of limited English proficient programs is to help limited English proficient students to close the achievement gap. However, it would also be of interest to measure a broader

set of outcomes, including native language skills, degree of bilingualism, non-cognitive skills, high school dropout rate, and educational attainment.

A final limitation is that the literature focuses on impacts on limited English proficient students and ignores the possibility that these education programs might have spillover effects on other students. The one study that considers this possibility finds that achievement for non-limited English proficient students is higher in districts that began to offer bilingual education as a result of a Texas administrative rule [9]. While this finding is consistent with non-limited English proficient students benefiting from lower exposure to limited English proficient students, this interpretation is speculative, and more research is needed on spillover effects.

SUMMARY AND POLICY ADVICE

Collectively, a set of recent studies using experimental and quasi-experimental variation in exposure to bilingual education to estimate its causal impact suggests that while receiving some instruction in the native language might lower English-language skills initially, its impact on later English proficiency and achievement is not systematically better or worse than that of English-only approaches. This finding does not mean that school programs for limited English proficient students are not helpful—the studies compare one type of limited English proficient program with another type, not with no program at all. Rather, the implication is native language instruction is not essential to program effectiveness. This may be because bilingual education and English-only programs, as implemented in US schools, have more similarities than differences—both focus on English language acquisition and both use English as the main language of instruction. Moreover, this finding does not preclude the possibility that some bilingual education programs might raise achievement among limited English proficient students more effectively than English-only programs do—or vice versa.

The national debate on how to educate limited English proficient students has focused too much on language of instruction. It would be productive to shift the focus to the quality of instruction [4]. Local communities should be able to choose a program that can be staffed with qualified teachers, have appropriate teaching/learning materials, deliver an adequate number of hours per day of English language development services, and meet broader community goals without first tying their hands about using or not using native language instruction.

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Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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