Closing the Word Gap with Big Word Club: Evaluating the Impact of a Tech-Based Early Childhood Vocabulary Program

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Sector(s): Education

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Location: United States (Multiple Locations)

Sample: 818 students from 72 participating preschool and Kindergarten classrooms at 47 schools

Target group: Students

Outcome of interest: Student learning

Intervention type: Early childhood education

AEA RCT registration number: AEARCTR-0002631

Data: OPEN ICPSR

Partner organization(s): Big Word Club

Vocabulary is critical to literacy development in early childhood, yet large disparities in vocabulary knowledge persist between children from high-income and low-income backgrounds. In a randomized evaluation, researchers evaluated the Big Word Club, a classroom-based digital learning program designed to increase the vocabulary of young children, to assess the program's impact on children's receptive vocabulary. Researchers found that the Big Word Club increased students' knowledge and retention of words included in the program.

Policy issue

Vocabulary is a key component of literacy development for young children. A growing body of research suggests that vocabulary is critical to language development, reading comprehension, and development of knowledge in specialized areas. However, research suggests that there are substantial differences in vocabulary knowledge between children from high-income and low-income backgrounds by the age of three.[1] By the end of grade 2, on average children have acquired around 6,000 words and those in the highest vocabulary quartile have acquired around 8,000 words. However, children in the lowest vocabulary quartile have acquired only around 4,000 words. This gap of 2,000 words is roughly equivalent to two grade levels in vocabulary development.[2] Can digital vocabulary learning programs increase vocabulary acquisition in early childhood?

Context of the evaluation

Big Word Club is a classroom-based digital literacy program intended to increase the vocabulary of children in preschool through sixth grade as a supplement to the normal classroom literacy curriculum. The program uses animated books, songs, and dance

activities that introduce children to one new word per day over the course of a school year, with classroom materials customized by grade level. Some of the words are "big" in that they are not typically in the vocabulary of such young children. For example, Big Word Club words at the preschool level include gargantuan, primate, prehensile, equator, and slither. The program's content is delivered to teachers on a web-based platform.

Students participate in a vocabulary learning activity through the Big Word Club.

Details of the intervention

Researchers conducted a randomized evaluation of Big Word Club to assess the program's impact on receptive vocabulary, which is the set of words a student can understand and to which a student can respond. Teachers in 72 preschool and kindergarten classrooms across 47 schools in the southwestern United States volunteered to participate in the evaluation for the 2017-2018 school year.

Researchers randomly assigned each school to either a treatment or control group. Teachers at schools assigned to the treatment group received access to the Big Word Club website. For each week in the school year the Big Word Club website provides five videos arranged around a common theme that introduce each word for each day. It also provides one animated digital book, one animated music video, and one dance video—all of which include the five words for that week. The last video for each week is a review of the week's words. Each video takes 1-4 minutes. Teachers at schools assigned to the control group proceeded with business as usual with no access to the Big Word Club website. The Big Word Club program started in November 2017 and continued through the duration of the school year.

Researchers administered a customized vocabulary assessment at two periods during the school year, first after 17 weeks of the intervention in March 2018 and second after 25 weeks of the intervention in May 2018. The researchers designed the assessment

based on the Peabody Picture Vocabulary Test (PPVT-4), a common measure used in research on early childhood literacy, but customized the assessment to include 38 Big Word Club words to test for children's knowledge and retention of Big Word Club words. To assess students' overall receptive vocabulary, researchers also administered a standardized version of the PPVT at the same time as the 25-week customized Big Word Club assessment.

At the time of the 25-week assessments, researchers gave teachers from both the control and treatment groups a survey that asked about characteristics of students in their classroom. The treatment group teachers were additionally asked about their usage of the Big Word Club program and their opinions about several aspects of the program. Researchers also tracked when teachers logged in to the Big Word Club platform, which they used as an approximation for how much teachers used the Big Word Club.

Results and policy lessons

Researchers found that the Big Word Club program increased students' knowledge and retention of words included in the Big Word Club curriculum. At 17 weeks after receiving access to the Big Word Club, students in classrooms with access to the program scored between .229 and .267 standard deviations higher on the customized vocabulary assessment than those in the control group. This effect persisted at 25 weeks into the program, where students in treatment group classrooms scored between .229 and .257 standard deviations higher on the same customized assessment than students in control group classrooms. These results translate to students in classrooms with access to the Big Word Club knowing on average a little more than one additional word out of 38 words on the customized assessment.

In addition to teaching words included in the Big Word Club program, a secondary goal of Big Word Club is to increase children's curiosity and receptivity to words and therefore increase their general vocabulary. However, the researchers were unable to definitively determine if the Big Word Club improved overall receptive vocabulary, as assessed through the standardized version of the PPVT.

The researchers noted that the measured impact of the program on vocabulary depends on two factors: 1) the difficulty of the words in the Big Word Club program, and 2) how often teachers use the program. First, over half of the students in control group classrooms were able to identify 22 of the 38 words in the customized Big Word Club assessment, suggesting that children in preschool and kindergarten may already be familiar with many of the Big Word Club words. Because vocabulary programs are measured by testing the words that are included in a program, the effect measured through the customized assessment may have been greater if the Big Word Club had a greater proportion of words that were less familiar to more students. Second, the data on program usage suggests that many teachers did not use the Big Word Club as regularly as intended; most teachers reported using each Big Word Club activity such as the animated book, song, and dance one to two times per week, whereas the program has content that can used five days of the week. The impact of the Big Word Club may therefore be greater if teachers dedicate more class time to using the Big Word Club lessons.

Overall, given its relatively low cost and ease of use, the Big Word Club may be a particularly cost-effective strategy for improving the receptive vocabulary of young children relative to other vocabulary learning programs.

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1. Farkas, George, and Kurt Beron. "The Detailed Age Trajectory of Oral Vocabulary Knowledge: Differences by Class and Race." Social Science Research 33, no. 3 (2004): 464-97. doi:10.1016/j.ssresearch.2003.08.001.

2. Biemiller, Andrew. 2005. "Size and sequence in vocabulary development: Implications for choosing words for primary grade vocabulary instruction." In Teaching and learning vocabulary: Bringing research to practice, edited by Elfrieda Hiebert and Michael Kamil, 223-242. Mahwah, NJ: Erlbaum.