

WELCOME! We will begin momentarily.

Note: all participants have been muted. Please use the chat function to ask questions throughout.





J-PAL Education, Technology and Opportunity Innovation Competition Webinar

J-PAL North America (MIT)

February 8, 2019

<https://www.povertyactionlab.org/edtech/competition>



Introducing the presenters



Vincent Quan

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J-PAL North America

Initiative Manager

Ariel Kalil

Professor at
University of Chicago
Harris School of Public
Policy

Co-director of the
Behavioral Insights and
Parenting Lab

Susan Mayer

Professor Emeritus at
University of Chicago
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Co-director of the
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Parenting Lab

Shane DeRolf

Founder and CEO
Big Word Club

WebEx housekeeping

- You have all been muted.
- We encourage you to use the chat function!
- We will answer your chat questions at the end of the webinar
- We are recording this presentation and will post it on the website within a week.

Agenda

- I. Introduction to J-PAL
- II. The J-PAL Education, Technology, and Opportunity Initiative (ETOI)
- III. Opportunities for Randomized Evaluations
- IV. Randomized Evaluation in Practice
- V. How to Apply
- VI. Q&A

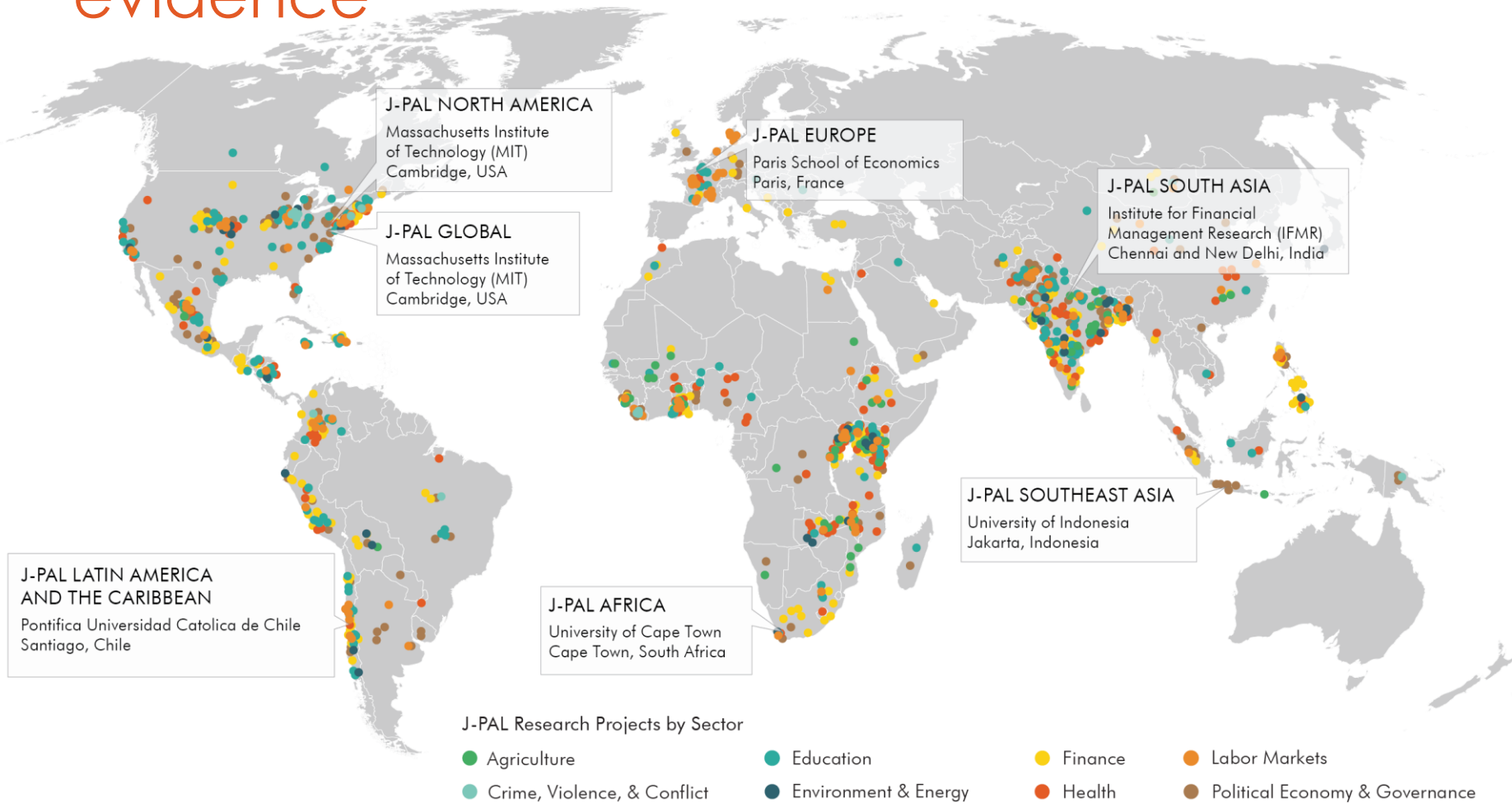


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J-PAL's mission is to reduce poverty by ensuring that policy is informed by scientific evidence



930+ ongoing and completed randomized evaluations in 80 countries

J-PAL's network of affiliated researchers



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The J-PAL Education, Technology, and Opportunity Initiative



This initiative supports US education leaders in generating evidence on how and to what extent uses of technology and innovation can improve student learning

Why Education Technology?

Tremendous disparities in educational achievement exist

Technology has the potential to help overcome existing challenges in education

Massive investments in ed tech – projected to reach **\$21 billion** by 2020 (*New York Times*, June 2017)

But many programs are untested and not everything we try works – evidence is needed to harness potential of ed tech

Important to get it right: Identifying and investing in what works can help us make inroads for student achievement



Goals of the J-PAL Education, Technology, and Opportunity Initiative (ETOI)

- Catalyze randomized evaluations of promising uses of education technology and innovation
- Build the capacity of education leaders to use data and evaluation
- Create a cohort of leaders who advance the use of rigorous evidence in education
- Share rigorous evidence with leaders who can act on research to generate solutions to critical challenges in education

Agenda

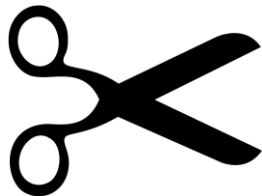
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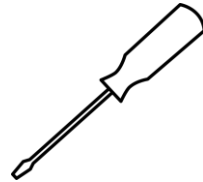
Methods as tools



Pre-post



Simple
Difference



Difference-
in-
Difference



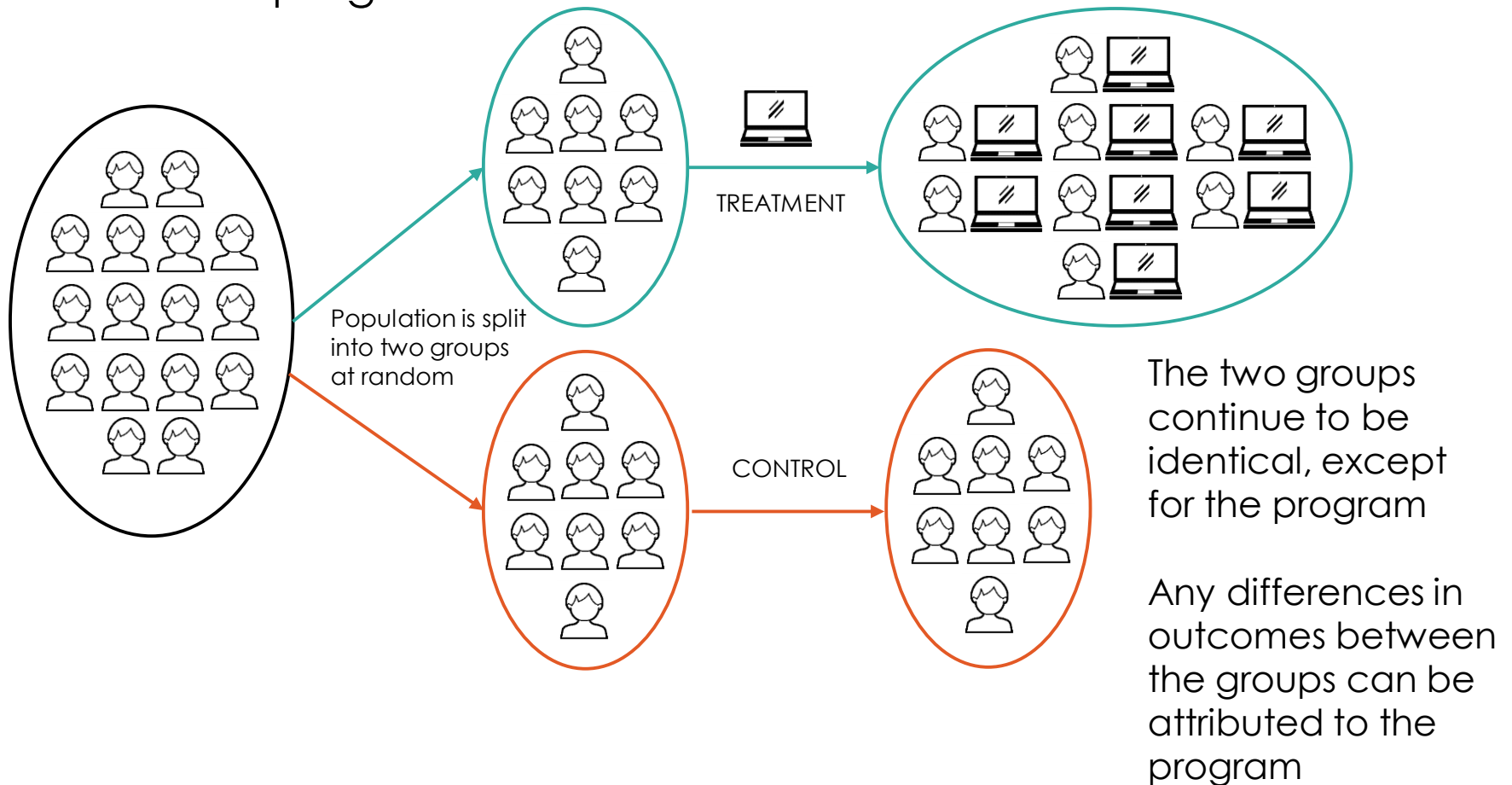
Regressions



Randomized
Evaluation

What is a randomized evaluation?

Before the program starts, eligible individuals are randomly assigned to two groups so that they are statistically identical before the program.



When to consider randomizing

- An **unstudied** or **understudied** program
 - e.g. a program that has not yet been rigorously evaluated
- Program or service is **over-subscribed**
 - If you can't serve everyone who is eligible, what is the optimal way (e.g. lottery) to allocate spots?
- Program **expansion**
 - e.g. moving into a new location or target population
- **Adding** a new **feature**
 - Can you roll out the new feature to some people and not others in order to measure its impact?
- Program **thresholds/cutoffs**
 - Those just below the cutoff (e.g. SAT score) could be randomly given a program

When does a randomized evaluation **not** make sense?

- **Too small:** sample size is too small to detect a meaningful differences in outcomes
- **Too early:** still ironing out logistics
- **Too late:** already serving everyone who is eligible, and no random assignment was built in
- When **a positive impact has been proven**, and we have the resources to serve everyone

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Why Words Matter



Shane DeRolf

Founder and CEO
Big Word Club



Why Words Matter

- A child's vocabulary growth is directly linked to his or her overall school achievement ¹
- The size of a child's vocabulary in kindergarten predicts his ability to learn to read ²
- A person's vocabulary level is the best single predictor of occupational success ³
- ***“Simply put: knowing more words makes you smarter”*** ⁴

¹ Weitzman, E. & Greenberg, J. (2010). ABC and Beyond: Building Emergent Literacy in Early Childhood Settings. The Hanen Centre: Toronto.

² Rowe, M. (2012). A Longitudinal Investigation of the Role of Quantity and Quality of Child-Directed Speech in Vocabulary Development. Child Development: 83(5), 1762-1774.

³ <https://litemind.com/top-3-reasons-to-improve-your-vocabulary/>

⁴ E.D. Hirsch, Jr. A Wealth of Words, The key to increasing upward mobility is expanding vocabulary, Winter 2013 Education: The Social Order

Closing the Word Gap

- There is a word gap in America between rich and poor
- Kindergarten students from lower socioeconomic families know 400–700 fewer words than their more privileged classmates
- Kids who start behind tend to stay behind
- Without new and effective interventions at both home and school, poor kids never “catch up”
- These kids never reach their potential
- Big Word Club aims to address this problem



Big Word Club Goals

SIMPLE & AUDACIOUS

- We believe that an improved vocabulary leads to an improved life
- Big Word Club set out to develop a low-cost and highly scalable digital learning program that would improve preschool and early elementary students' vocabularies
- 1,000+ classroom pilot in 2016 provided strong anecdotal evidence of Big Word Club's effectiveness but we found that anecdotal evidence is not enough for market adoption
- With completion of randomized evaluation in 11/18, we have moved from anecdotal evidence to scientific data

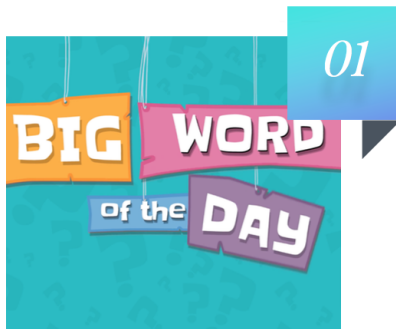


Benefits of Randomized Evaluation

- Randomized evaluation funded by J-PAL and implemented by the University of Chicago and University of Toronto provided Big Word Club with credible and measurable evidence of the program's effectiveness
- We have found this evidence to be invaluable when it comes to sales and fundraising
- An unexpected benefit of the evaluation was that we learned how to develop future content that will further improve Big Word Club's impact on children's vocabularies



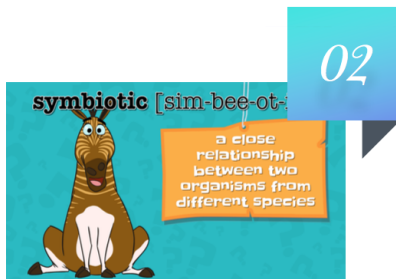
Program Overview



Big Word Club's animated videos introduce preschool and early elementary school students to a new "BIG" word every day of the school year – **in less than one minute!**



Each week's five "BIG" words are reinforced in an animated book, song and dance



Kids see and hear each day's "BIG" word spelled correctly and phonetically, defined and used in a sentence



Big Word Club's Weekly Review videos challenge students to use "BIG" words in their own sentences

To see a short video about Big Word Club, visit <https://vimeo.com/161251700>

Evaluation of the Big Word Club



Susan Mayer

Co-Founder, BIP Lab
Professor, Harris Public Policy
University of Chicago



Ariel Kalil

Co-Founder, BIP Lab
Professor, Harris Public Policy
University of Chicago



Philip Oreopoulos

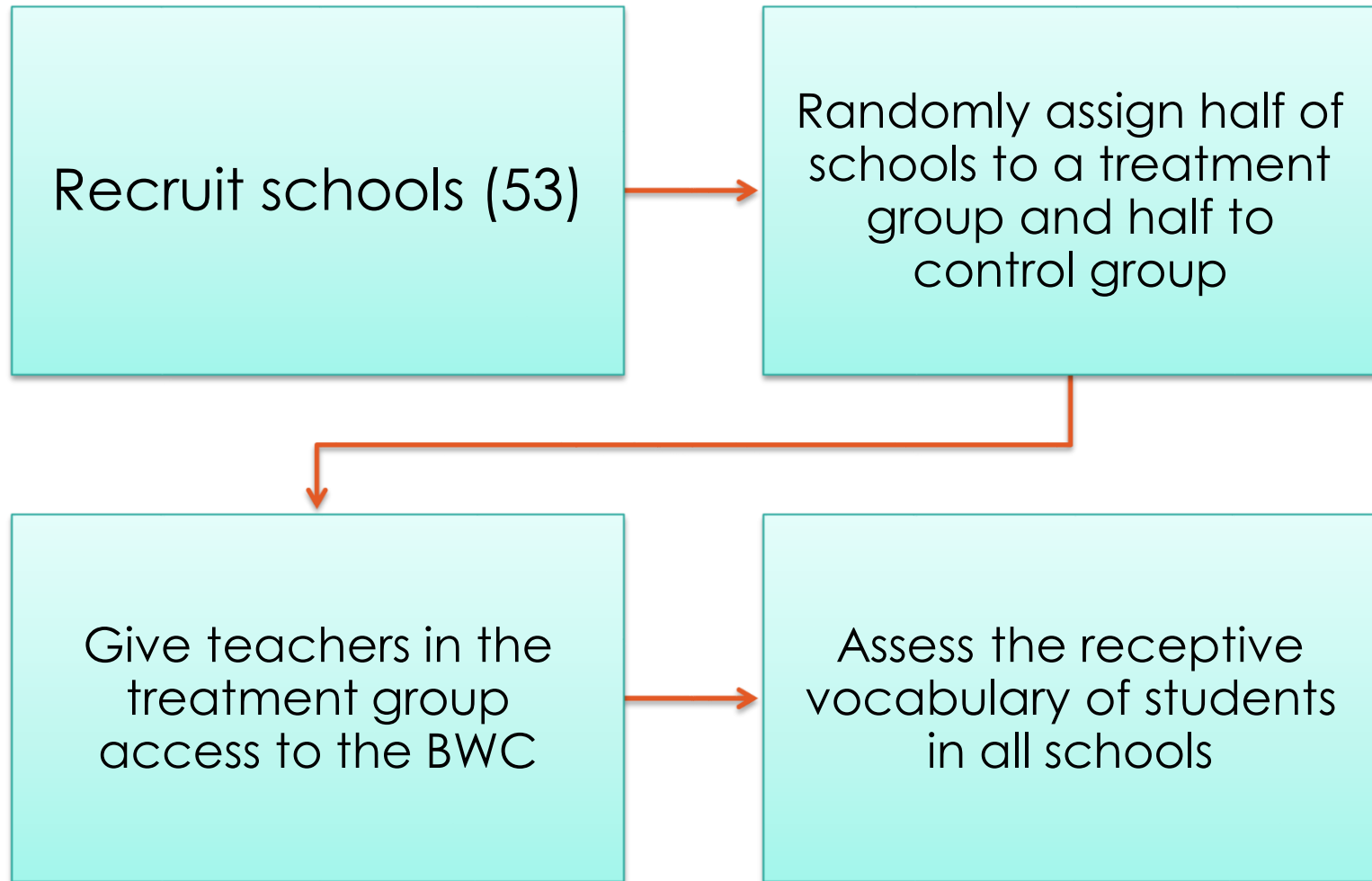
Professor, Economics
University of Toronto

Objective of the evaluation

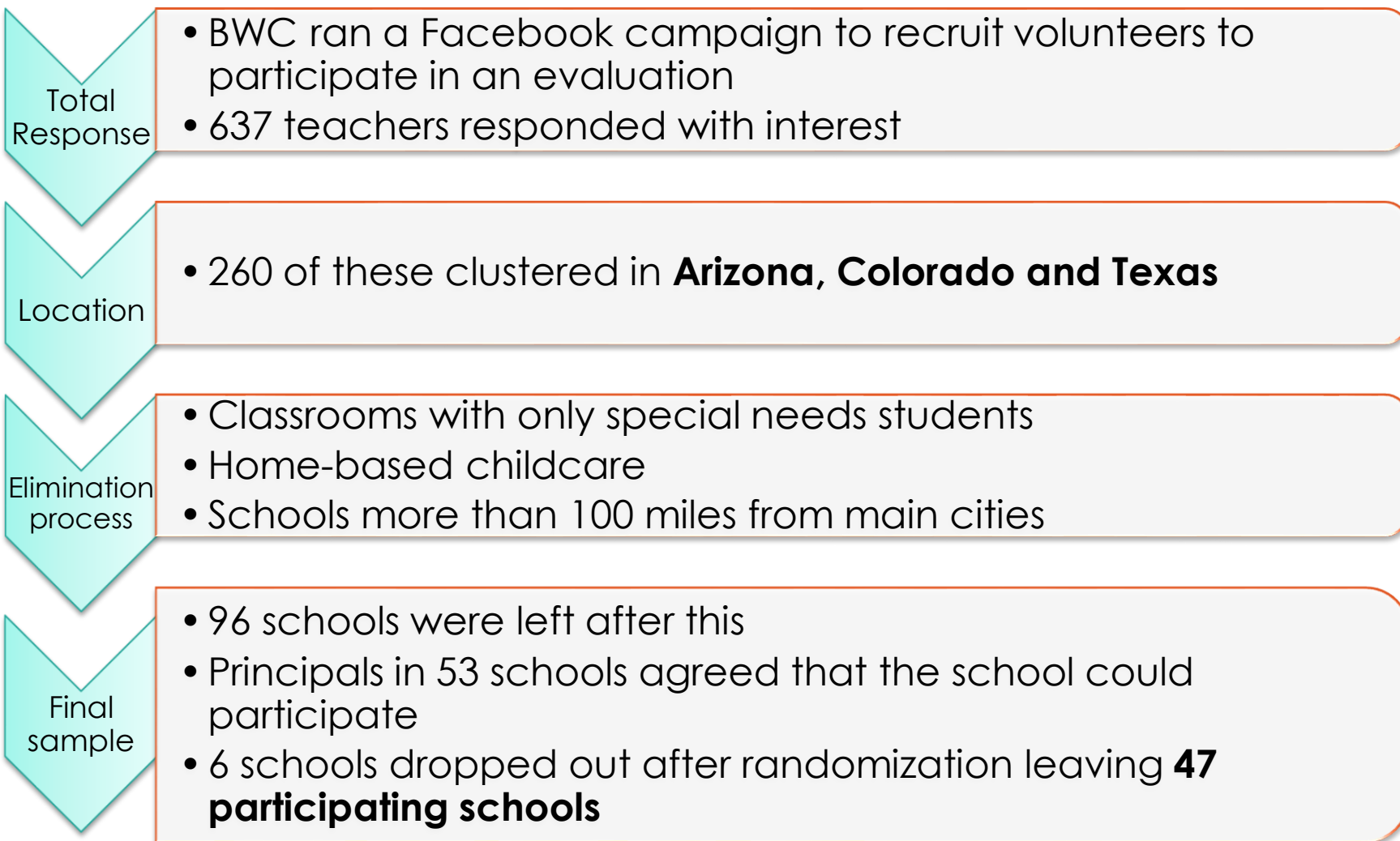
- Compare the **receptive vocabulary** of students in classrooms with access to the BWC to the receptive vocabulary of students in classrooms without access to the BWC
- Understand why we get the results that we get

Receptive vocabulary: The number of words a child can understand even if the child cannot produce the word

How we conducted the evaluation



How we recruited schools



Assessment tools

- We assessed the receptive vocabulary of all students twice:
 1. 17 weeks after treatment teachers first had access to the BWC
 2. 25 weeks after treatment teachers first had access to the BWC
- The Assessment tools were:
 1. The BWC Assessment developed by the research team
 2. The Peabody Picture Vocabulary Test – a standardized test of receptive vocabulary

Interpreting the results

- For most estimates we control for **co-variates**:
 1. the state
 2. whether the school is Title 1
 3. percent of students receiving free or reduced price lunch
 4. whether the school is private
 5. students' grade
 6. gender
 7. the assessor's evaluation of whether the student is an English language learner
 8. the assessor's evaluation of whether the student qualifies for an IEP

Co-variates: Factors likely to influence the outcome

17-week results: BWC assessment

- The **average valid score** for the treatment and control groups combined was 24.1 words out of 38 words
- The **minimum** was 7 words
- The **maximum** was 37 words

17-week results: BWC assessment

- Treatment group students identified between 1.197 and 1.638 more words compared to the control group depending on the estimation model
 - Equivalent to an effect size between .298 and .320 standard deviations depending on the model

25-week results: BWC assessment

- Treatment students identified between 1.285 and 1.561 more words compared to the control group depending on the model.
 - This is equivalent to an effect size between .285 and .305 standard deviations depending on the model

Gains were retained over the short run

25-week results: PPVT

- Treatment students identified between 1.482 and 2.44 more words compared to the control group
 - This is equivalent to an effect size between .109 and .158 standard deviations
- None of the PPVT results are statistically significant at $p=.05$ although the confidence intervals are consistent with a substantial effect on the PPVT

Why didn't students learn more words?

Teacher use of the BWC **varied**

- As tracked by website logins
- As reported by teachers

Content of the BWC

- Based on review of BWC words
- Item analysis of words in BWC Assessment

How much did teachers use the BWC?

- Over the first month teachers logged in an average of **.70 times** per potential school day
- Over the next month they logged in on average **.59 times** per potential school day
- Over the next two months they logged in on average **.45 times** per potential school day
- Over the last month they logged in on average **.39 times** per potential school day

If teachers used BWC as intended they would use it close to 1.0 times per potential school day

Teacher views of the BWC

- Main reason for not using the BWC was “too many other required activities”
- Teachers over-estimated the amount that students learned from the BWC
 - over half estimated that students learned between 6-12 words
- 75% of teachers said they were “probably” or “definitely” interested in using the BWC in the future

Content of the BWC

- Students can only learn new words if they do not already know the words
 - Over 50% of control group students could identify 26 of the 38 words in the BWC Assessment.
 - Over 80% of control group children could identify 12 of the BWC words.

Content of the BWC

- Almost all of the gain by the treatment group came from the words least likely to be known by control students
 - For the 10 words that most control group students knew, there was 0% chance of a difference in correct response between treatment and control students
 - For the words that the control group was least likely to know, the chance was 80% that there was a difference between treatment and control

Results in perspective

- There are very few evaluations of other vocabulary programs intended to supplement the existing curriculum
 1. **Elements of Reading**: effect size after 2 years = no statistically significant effect
 2. **K-PAVE**: effect size = .14 on a standardized test of vocabulary
- **Very hard** to change a standardized score like the PPVT
- **BWC is probably less expensive than these programs because both require teacher training and on-going support**

Conclusion

- Compared to other similar programs, the BWC is a **cost-effective** way to increase vocabulary
- Its measured benefit may be larger:
 1. With a somewhat different word selection
 2. With greater fidelity to implementation

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Education, Technology, and Opportunity Innovation Competition

- K-12 education leaders can apply for:
 - Pro-bono technical support to develop an evaluation
 - Trainings about data and evaluation
 - Connections with J-PAL's network of leading academic researchers to run the study
- May also be eligible for up to **\$50,000 in funding**
- **Who is eligible to apply?** Organizations serving K-12, **including** school districts, school networks, local/state education agencies, CMOs, and education non-profits
 - For-profit ed-tech companies who are partnering with any of the aforementioned categories may apply jointly

J-PAL is now inviting Letters of Interest from education leaders

- We define ed tech and innovation broadly
 - Topics could include computer-assisted learning software, low-cost technologies (e.g. mobile apps), online learning
- Focus area: Particularly interested in technology being used as part of an instructional model
- To apply, submit a 3-5 page **letter of interest** describing
 - The policy question or challenge that motivates your application
 - The program you would like to evaluate
 - How many people are currently reached
 - Potential opportunity for a randomized evaluation
 - Access to data for measuring outcomes

Timeline

- **April 1, 2019** – Deadline to submit letters of interest
- **Mid April – late April 2019** – Finalists invited for interviews and asked to submit additional information (including proposed budget)
- **Early June 2019** – Winners announced
- Go to povertyactionlab.org/edtech/competition for more information

Characteristics of a strong application

- Potential to meaningfully improve education through technology and innovation; potential to scale
- Focus on helping disadvantaged students
- Clearly defined program and outcomes of interest
- Feasibility
 - Potential sample size
 - Availability of data, particularly administrative data
 - Willingness and feasibility of randomization
- Organizational capacity and commitment

Other Resources

J-PAL Education Technology Evidence Review

- Summarizes over 126 experimental studies
- Looks at four categories of education technology:
 - Access to technology/hardware
 - Computer-assisted learning/software
 - Online learning
 - Low-cost technology-based nudges



WILL TECHNOLOGY TRANSFORM EDUCATION FOR THE BETTER?

This publication summarizes a forthcoming academic review paper on education technology, "Upgrading Education with Technology: Insights from Experimental Research."

OVERVIEW AND POLICY ISSUES

In recent years, there has been widespread excitement around the transformative potential of technology in education. In the United States alone, spending on education technology has exceeded \$13 billion.¹ Programs and policies to promote the use of education technology (or "ed tech")—including hardware distribution, educational software, text message campaigns, online courses, and more—may expand access to quality education, support students' learning in innovative ways, and help families navigate complex school systems. However, the rapid development of education technology in the United States is occurring in a context of deep and persistent inequality.² Depending on how programs are designed, how they are used, and who can access them, education technologies could alleviate or aggravate existing disparities.

While access to computers and internet is expanding, approximately five million school-age children still do not have a broadband internet connection at home,³ putting them at a disadvantage for homework assignments, access to online resources, and digital literacy development. Low-income students and students of color in particular disproportionately lack access to technology.⁴

It is important to step back and understand how technology can help—or in some cases hinder—student learning. In this executive summary, we synthesize the experimental literature on technology-based education interventions, focusing on literature from developed countries.⁵ We share key results and highlight areas for future inquiry.

¹ Technology for Education Consortium, "How School Districts Cut Costs (Without an EdTech)," accessed December 20, 2018, https://marketbasedlearning.com/wp-content/uploads/2017/05/How_School_Districts_Cut_Costs_Without_an_EdTech.pdf.

² Anandian, Sarah, Diandra Rodriguez, and Kenneth Shores, "The Geography of Racial/Ethnic Test Score Gaps," CPRE Working Paper No. 16-05, Stanford Center for Education Policy Analysis, Stanford, CA, 2016.

³ Pew Research Center, "Digital divide persists even as lower-income Americans make gains in tech adoption," accessed December 20, 2018, <http://www.pewresearch.org/fact-tank/2018/05/23/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>.

⁴ Nelson, George and Robert Farley, "Technology and Education," *Handbook of the Economics of Education* 5 (2011): 129-180.

⁵ This policy brief also references studies from developing countries when relevant.



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Thank you

For questions about the J-PAL Education, Technology, and Opportunity Initiative, contact:

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