



Phonics-Based Instruction and Improvement in Foundational Reading Skills of Kindergartners in the Indian Schooling Context

Sunaina Shenoy¹ · Anuj Iyer² · Siamack Zahedi²

Accepted: 15 September 2022 / Published online: 3 November 2022
© The Author(s), under exclusive licence to Springer Nature B.V. 2022

Abstract

Most private schools in India follow the Alphabet-Spelling method to teach reading in English. This approach bypasses letter-sound correspondences and focuses on rote memorization and sight-word recognition. In an effort to provide students with more recent evidence-based practices in reading instruction, this study examined how phonics-based instruction related with early English literacy outcomes for students in kindergarten. Our sample consisted of 627 students attending a private middle-cost school in Mumbai, India where the language of instruction was English. Students were tested for early literacy skills in kindergarten using the DIBELSNext benchmarking measures. We compared groups of students who received no phonics ($n=165$) to students who received one year of phonics ($n=234$) and students who received two years of phonics ($n=228$) respectively. Our results suggested that students who received both one and two years of phonics instruction in preschool significantly outperformed those who did not receive any phonics instruction on all the literacy skills assessed. Moreover, the incidence of students being at-risk for reading difficulties reduced significantly with an increase in years of phonics instruction. Implications for reading research, practice, and policy in the Indian context are discussed.

Keywords Phonics instruction · Early literacy outcomes · At-risk · Middle-cost school · India

English is an integral part of the education system in India because it is one of the two official languages of the country, along with Hindi (National Council of Educational Research and Training, 2011). Given the linguistic diversity of the country and numerous languages that are spoken in different states, English is also used as the national mode of communication and the unifying link language (National Council of Educational Research and Training, 2011). It is the language of economics and business and is viewed as a requirement for economic and social mobility (Ramanathan & Bruning, 2003). However, according to the Annual Status of Education Report, only 19.3% of Grade 3 students in rural parts of the country could read simple words such as “day” or “sit” in English (Annual Status of Education Report [ASER], 2018). In urban parts of the country, the situation is not that different with students in Grade 3 scoring

an average of 257 out of 500 on the National Achievement Survey (NAS) on three measures of listening comprehension, word recognition, and reading comprehension, leaving approximately 50% of Grade 3 students unable to perform at grade level (National Council of Educational Research and Training, 2014).

One of the key drivers of this problem is the foundational English literacy curriculum. The complex and vast amount of content that students are expected to complete forces teachers to resort to superficial coverage of learning materials and rote memorization, instead of facilitating deeper thinking (Ministry of Human Resource Development, 2014; Ministry of Human Resource Development, 2018). India has been too focused on advanced content rather than building foundational skills in a developmentally appropriate manner (Banerjee & Duflo, 2011; Glewwe et al., 2009; Pritchett & Beatty, 2012). The most empirically-supported method for teaching foundational reading in English is systematic phonics instruction (Ehri et al., 2001; Gersten & Baker, 2003; Johnston & Watson, 2005; Stuart 1999; Stuart, 2004; Torgesen, 2000). However, in India, the predominant method for teaching reading is the Alphabet-Spelling method (Gupta,

✉ Sunaina Shenoy
shenoy@unm.edu

¹ University of New Mexico, Albuquerque, NM, USA

² The Acres Foundation, Mumbai, India

2014), in which students bypass letter-sound correspondences and are taught to read by rote memorization and sight word recognition. Even the latest revision of the National Education Policy does not mention integrating well-established, evidence-based, and developmentally appropriate English reading instruction approaches like phonics that have been highly effective in building foundational reading skills in the younger years (Ministry of Human Resource Development, 2020).

Very few studies have investigated English phonics-based instructional programs in the Indian context, out of which two studies used the same dataset (Dixon et al., 2011; Schagen & Shamsan, 2007) to investigate the effects of typical synthetic phonics-based programs on student literacy development. They found that phonics-based programs significantly improved English literacy outcomes for students (Dixon et al., 2011; Schagen & Shamsan, 2007). While this suggests that phonics-based programs have potential in the Indian schooling context, a larger body of empirical evidence is needed to confidently validate the claim. Our study aimed to contribute additional evidence related to this topic and context. Our study site was the ABC English Medium School - a private school in Mumbai, India, whose assessment data from 2016 showed that 87% of Kindergarten students performed below grade level benchmarks on composite measures of foundational reading in English. In order to address this problem, the school revamped its foundational literacy program to include systematic phonics instruction. Our study examines the subsequent changes in (a) English literacy outcomes for students in kindergarten, and (b) the incidence of students not meeting grade-level English literacy benchmarks.

English in the Indian Schooling Context

In India, schools typically follow a three-language formula (Aggarwal, 1991) that is endorsed by the National Curriculum Framework of 2005 (Ramanathan, 2008; Ratti, 2015; Sharma & Ramachandran, 2009). The two official languages of the country, Hindi and English have to be introduced as two of these three languages (Joshi et al., 2017; Saini, 2000;), and the third one is typically the regional or state language. In 2020, the National Education Policy (2020) revisited this policy and stated that the three-language formula will continue to be implemented but with more flexibility; the Center will no longer impose any languages, it will be up to states to decide what languages to introduce in schools, as long as two out of the three languages being taught are native Indian languages (Ministry of Human Resource Development, 2020).

In addition, the new policy recommends that the local language or mother tongue is introduced as the primary language of instruction till Grade 5. While a majority of states have accepted this in principle, there have been challenges in implementation (Ratti, 2015) and a great variation across the nation in the languages taught, their order and the time at which they are introduced (Menganathan, 2011). An additional complexity is that in most urban centers, a child's home language may differ from the national or state languages introduced in school. A child in India is exposed to at least three to four languages from ages 0–13 years: a home language (L1); school language 1 (L2) which is the language of instruction; school language 2 (L3) and school language 3 (L4). The home language can be completely different from the language of instruction and other school languages, and may even differ between a child's mother and father. The language of instruction and school languages can vary between the two official languages, English and Hindi and the state language. For our sample it was English as the L2, Hindi as the L3 and Marathi as the L4. In schools where English is the language of instruction, in a seven-hour school day, a student is typically exposed to six hours of instruction in English, and one hour of instruction in Hindi or the state language (Shenoy et al., 2020).

Though India has a large public school sector, widespread parental concern about the poor quality of public education has led up to 50% of Indian children to be enrolled in private institutions (ASER, 2018). These private schools follow a state, national or international standardized curriculum, and the language of instruction is most often English (Kurrien, 2005; Meganathan, 2011) since it is considered essential for social and economic mobility in India.

Alphabet-Spelling Method vs. Phonics-Based Reading Instruction

The predominant method used to teach reading English in India is the "Alphabet-Spelling Method" (Gupta, 2014, p. 3911). Students are taught letter names and how to spell out words; therefore, they bypass the sound structure of the language and acquire new words by sight word recognition instead. Students are expected to learn "common" words as a whole and learn to recognize new, unfamiliar words by rote-memorization (Annamalai, 2004). In a similar way, students move on from learning letter names and words to learning sentences by rote (Dixon et al., 2011). Students are not taught how to blend or segment letter sounds into words and can only read words that are familiar to them with limited comprehension. It is very common for teachers in Indian classrooms to teach reading by focusing on written products, such as copying from the board and

choral recitation, rather than comprehension. One teacher in Gupta's (2014) study reported: "These children are not reading because they are not copying the letters. Teachers used terms that are central to initial reading—picture, word, letter, sound and spelling—interchangeably" (Gupta, 2014, p. 3912). These practices are not aligned with international evidence-based approaches for building foundational literacy, which include systematic phonics instruction at their center.

Systematic phonics instruction stresses the acquisition of letter-sound correspondences to learn new, unfamiliar words. A large body of international research shows that the use of explicit and systematic phonics instruction over two to three years is critical during early childhood years leading up to Grade 1 (Castles et al., 2018; de Graaff et al., 2009; Ehri, 2020; Ehri et al., 2001; Gupta 2014; Mesmer & Griffith, 2005; National Reading Panel, 2000; Stahl, 2001; Torgerson et al., 2019; Torgerson et al., 2006; Tunmer & Arrow, 2013). These programs are most effective when integrated as a part of a broad and balanced curriculum that includes the five key components identified as essential by research, including phonics, phonemic awareness, fluency, vocabulary and comprehension (Buckingham et al., 2019; National Early Literacy Panel, 2008; National Reading Panel, 2000; Torgerson et al., 2006; Tunmer & Arrow 2013). Specific types of phonics programs—structured *synthetic phonics* programs -- have emerged as highly efficacious (Castles et al., 2018; Ehri et al., 2001; National Reading Panel, 2000; Johnston et al., 2012). In such programs, resources and instructional guidance are provided to explicitly teach students to convert letters into sounds or phonemes and then blend them to form recognizable words (Gupta, 2014; National Reading Panel, 2000).

Several research studies support systematic, synthetic phonics programs for native speakers of English as seen above as well as students who speak English as a second language (Stuart, 1999; Stuart 2004). This latter finding is especially relevant to an Indian context where students come from bilingual or multilingual home backgrounds. Moreover, phonics-based instructional programs have been instrumental in reducing the number of students being identified as being at-risk for reading difficulties (Torgesen, 2000). Explicit and systematic phonics instruction can remediate and prevent reading disabilities for both monolingual students (Torgesen, 2000) and English learners (Gersten & Baker, 2003), and this is especially true if students are instructed in these skills in preschool and kindergarten (Ehri et al., 2001).

There are a scarce number of studies that have emerged from India on English phonics instruction: Gupta (2014) studied how new instructional methods like phonics are implemented from a teacher's perspective; Nishanimut

et al., (2013) studied the effect of using L1 knowledge of phonics to improve L2 phonics instruction; Karande et al., (2011) emphasized the use of phonics to remediate specific learning disabilities in schools in India; and Patel et al., (2018) introduced a computer-assisted reading intervention called GraphoLearn, which used grapheme-phoneme correspondences to remediate reading problems in struggling readers. Though these studies have explored important aspects of phonics instruction, there are only two empirical studies to our knowledge (Dixon et al., 2011; Schagen & Shamsan, 2007), both of which examined the same data set about student outcomes in response to a synthetic phonics program that was implemented in 20 low-cost English-medium schools in Hyderabad. The control group of students received traditional English instruction involving rote learning and whole word recognition, while an experimental group received phonics-based instruction. Their findings showed a statistically significant difference between the experimental and control groups, with the experimental group performing better on measures of reading, spelling and sounding out letters and words, with effect sizes ranging from 0.26 to 0.62.

Implementation of Phonics at ABC English Medium School

ABC English Medium School conducted a schoolwide implementation of the DIBELSNext battery of international, curriculum-based, benchmarking tests in 2016. The results showed that 87% of its kindergarten students performed below benchmark and might be at-risk of not meeting grade-level literacy standards in English. The school recruited a team of expert educational consultants for support and it was quickly identified that one of the drivers of the problem was the use of the traditional Alphabet-Spelling approach for teaching reading English in the preschool grade levels. Subsequently, the school decided to replace the traditional approach to teaching foundational reading with a synthetic phonics approach. A commercially available program was chosen because it used a multi-sensory approach to teaching letter sounds, blending sounds in order to read and write words, segmenting and identifying sounds in words, sight reading for words with unusual spellings, and letter formation and writing.

ABC English Medium School purchased the program before the start of the 2018 and 2019 academic year. The program included a resource kit which included a variety of resources for students and teachers to use, such as worksheets, audio and video guides, teaching guides, and workbooks. Additionally, a program certified trainer was recruited to conduct two full days of workshops at the start

of each year. Three months later, the trainer conducted a model teaching and refresher workshop with the teachers for one full day. Also, the trainer visited for classroom observations and feedback, in the sixth month of each school year and again in the ninth month of each year. Finally, the trainer also conducted a workshop with parents each year to educate them on phonics versus the Alphabet-Spelling approach that parents were acquainted with and experienced in their own schooling. The dosage of literacy classes to students per week remained the same as earlier – 30 min every day, five days a week.

The following research questions reflect our investigation into the relationship between student outcomes and the implementation of the phonics-based program at ABC English Medium School:

1. How did the number of years that students received phonics instruction in preschool relate to their English literacy performance in kindergarten?
2. How did the number of years that students received phonics instruction in preschool relate to the incidence of them being at-risk for not meeting grade-level English literacy benchmarks in kindergarten?

Method

Design

This study used a combination of quasi-experimental and non-experimental quantitative approaches to investigate the research questions. Specifically, a non-equivalent control group posttest-only design was used for the first research question. This design was deemed most appropriate as the study had a comparison group but participants were sampled based on their natural grouping rather than through random assignment (Baker, 2017; Kirk 2012; Williams, 2007-). The independent variable across the treatment and control groups was the years of phonics instruction that they received, while the dependent variable was their performance on standardized tests of early reading ability. Further, it was not possible to use a purely experimental design as the researchers did not have any control over the variables before or during data collection and participants were not randomly assigned (Kirk, 2012; Williams, 2007). Finally, the groups were not assessed at the outset of the study before being exposed to the independent variable and so the researchers were forced to use a posttest-only design (Baker, 2017; Kirk, 2012; Williams, 2007). A descriptive comparative design was used to investigate the second research question, as the researchers used pre-existing data from the schools without manipulating the independent variable (Baker, 2017; Johnson, 2001;

Table 1 Age and gender distribution of students across comparison groups

	Cohort 0	Cohort 1	Cohort 2
Boys	57% (n=94)	52% (n=122)	52% (n=118)
Girls	43% (n=71)	48% (n=112)	48% (n=110)
Minimum Age	5 years 0 months	4 years 11 months	5 years 0 months
Maximum Age	6 years 5 months	6 years 2 months	6 years 7 months

Williams, 2007;). Further, data was collected from two or more groups and descriptively analyzed in terms of differences in quantitative trends between the groups without the use of any statistical analysis methods (Baker, 2017; Johnson, 2001).

Participants

Schools in India typically follow a three-year structure for students in early childhood - namely Nursery (3–4 year olds), Junior Kindergarten (4–5 year olds), and Senior Kindergarten (5–6 year olds). The participants in our study included 627 early childhood students who attended ABC English Medium School. They came from different home language backgrounds but were primarily instructed in English in school. School records showed that 0.8% of the students indicated that English was their mother tongue, while 99.2% indicated that their mother tongues were other regional Indian languages like Gujarati, Marathi, and Hindi at home. In terms of their economic background, no data on family income was collected by the school. However, since the average Indian household spends between around 10% of its per capita income towards schooling (Centre for Civil Society, 2017), we can estimate that the students' families earn at least INR ₹12 lakh per year (approximately USD \$15,000), which would place them in the *middle class* that makes up approximately 13% of households in India (Jasuja & Khan, 2017).

Table 1 presents the demographics of our sample. We had three cohorts: students who received no phonics or Cohort 0 (n=165), students who received one year of phonics during their Senior Kindergarten year or Cohort 1 (n=234), and students who received two years of phonics during their Junior Kindergarten and Senior Kindergarten years respectively or Cohort 2 (n=228). We had 94 boys (57%) in Cohort 0, 122 boys (52%) in Cohort 1 and 118 boys (52%) in Cohort 2. The mean age of students in Cohorts 0, 1 and 2 was 5 years and 7 months, 5 years 1 month and 5 years 8 months respectively. Students in all three groups were assessed on their early literacy skills in the middle of their respective Senior Kindergarten years, between the months of October and November.

School Setting

ABC English Medium School was a private PreK-10 institution located in Mumbai and was affiliated with the Indian Certificate of Secondary Education Examination (ICSE) - one of the most popular national boards for private schools in India with more than 2,300 school affiliates. Nearly half of India's students study at private schools (Ministry of Human Development, 2019), and the fees at such schools range from ₹2,400 or roughly USD \$32 per year (MoSPI, 2019) up to ₹2,400,000 or USD \$33,000 per year. However, only 9% of students pay more than ₹24,000 or USD \$325 per year (MoSPI, 2019). ABC English Medium School charged an annual tuition fee of around ₹114,000 or USD \$1500 per year. The language of instruction at the school was English.

Measures and Data Collection

The data used for this study was secondary in nature, given that the researchers simply analyzed existing data about student performance from ABC English Medium School. The school assessed students' early literacy skills using The Dynamic Indicators of Basic Early Literacy Skills (DIBELS-Next) benchmarking tests - a battery of curriculum based measures that were developed in the US and included subtests to measure pre-literate skills in kindergarten and Grade 1, such as phonemic awareness and letter-sound knowledge (i.e., First Sound Fluency, Phoneme Segmentation Fluency, and Nonsense Word Fluency) as well as subtests that measure reading fluency and reading comprehension, including Oral Reading Fluency (ORF) and Retell Fluency for students in grades 1–6, and the Daze comprehension subtest which is for students in Grades 3–6 (Munger et al., 2014). These assessment tools have been validated through research (Burke et al., 2009; Elliot et al., 2001; Goffreda et al., 2009; Good et al., 2004; Hintze et al., 2003; Riedel & Samuels 2007; Roehrig et al., 2008; Rouse & Fantuzzo 2006), and are widely used in the U.S. to benchmark K-6 students against empirical milestones for early literacy skills (Good et al., 2004). Most importantly, there is evidence to support the validity of the DIBELS measures for non-native English speakers as well (Vanderwood et al., 2014) - an important consideration for our context.

The data utilized for the purpose of this study was collected when students across the three groups under comparison were in the middle of their Senior Kindergarten year, between 2016 and 2019. The total individual administration time was approximately 15 min per student. All these subtests were timed measures and were administered for 1 min each. The following subtests were administered for students in kindergarten:

1. **First Sound Fluency:** This subtest is a measure of a student's ability to identify initial sounds in words. The student earned 1 point for each correct first sound produced.
2. **Phoneme Segmentation Fluency:** In this task, the student had to break up a word into corresponding sound segments; for example, the word "cat" has three sound segments: /c/ /a/ /t/. The student earned 1 point for each correct sound produced.
3. **Nonsense Word Fluency:** This subtest consists of two parts: correct letter sounds (CLS) and whole words read (WWR). This test measured the students' knowledge of letter-sound correspondences, and their ability to process CVC combinations that were non-words (e.g. /v/ /o/ /l/). Students earned credit for 1 CLS for each correct letter sound read by itself or as part of a make-believe word. They also earned 1 WWR for each whole word read correctly without first being sounded out.

Fidelity and Reliability

A series of measures were taken by ABC English Medium School to ensure that the DIBELS tests were administered with a high level of fidelity, and that the data was reliable. In 2016, the first round of DIBELS tests were conducted by a team of external consultants hired by the school. In 2018, the same consultants trained teachers and special educators working in ABC English Medium School's early childhood department. The training included an overview of relevant tests in the DIBELS inventory, demonstrations of how to conduct each individual test measure, and mock exercises for staff to practice conducting the tests in a simulated manner. Only when a staff member demonstrated each test's administration with a high level of fidelity, were they approved as test-takers for the actual round of assessments. Finally in 2019, the school's leaders led the training sessions for staff members themselves as they believed they had built a sufficient understanding of the testing process based on the previous three years of support from the external consultants. Fidelity of implementation was monitored by the school's Literacy Head, by way of her observing every single teacher conducting during their initial few tests and intervening with feedback or coaching with specific individual staff who needed support.

Data Analysis

We summarized the DIBELS data received from the schools and used quantitative methodologies to answer our research questions - first to examine the relationship between years of phonics instruction and literacy outcomes, and second, to examine the relationship of years of phonics instruction

Table 2 Summary statistics and effect sizes for students in kindergarten

	Mean	SD	Max	Min	C0:C1		C1:C2		C0:C2	
					Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value
Composite Scores										
Cohort 0 (2016-17)	72.83	41.04	175.00	0.00	57.34	0.000				
					d= 1.19					
Cohort 1 (2018-19)	130.18	54.78	335.00	29.00			22.35	0.000157		
							d=0.356			
Cohort 2 (2019-20)	152.53	70.53	348.00	0.00					79.7	0.000
									d= 1.42	
Phoneme Segmentation Fluency										
Cohort 0 (2016-17)	10.56	12.91	56.00	0.00	16.20	0.000				
					d= 1.04					
Cohort 1 (2018-19)	26.76	17.98	69.00	0.00			13.11	0.000		
							d=0.723			
Cohort 2 (2019-20)	39.88	18.59	75.00	0.00					29.32	0.000
									d= 1.86	
First Sound Fluency										
Cohort 0 (2016-17)	15.22	13.57	45.00	0.00	15.81	0.000				
					d= 1.12					
Cohort 1 (2018-19)	31.03	14.47	60.00	0.00			6.26	0.000002		
							d=0.458			
Cohort 2 (2019-20)	37.30	12.86	60.00	0.00					22.07	0.000
									d= 1.67	
Nonsense Word Fluency										
Cohort 0 (2016-17)	10.18	14.69	77.00	0.00	20.58	0.000				
					d= 1.01					
Cohort 1 (2018-19)	30.77	21.95	143.00	0.00			10.02	0.000067		
							d=0.37			
Cohort 2 (2019-20)	40.84	30.11	143.00	1.00					30.61	0.000
									d= 1.28	

to student risk status. For the first research question, we derived summary statistics for the three groups under study and reported on Cohen's *d* effect sizes to compare the statistical significance of any differences between groups on the dependent variable (Durlak, 2009). Independent sample *t*-tests were conducted using SPSS 26 to generate the summary statistics - mean differences and *p*-values - across groups, after which Cohen's *d* values were calculated. Given that Cohen's *d* is a measure of the standardized mean difference between two groups, we separately computed and reported the magnitude of differences between all three pairings of groups for each of the measures in our study (Durlak, 2009). For the second research question, we calculated percentages of students across the three groups who were categorized as being "at/above benchmark", "below benchmark" and "well-below benchmark" in relation to age-appropriate reading benchmarks in kindergarten. We referred to the official benchmarking cut-off points provided in the DIBELSNext technical manual (Good et al., 2013).

Results

Kindergarten Early English Literacy Outcomes

Our first research question states:

How did the number of years that students received phonics instruction in preschool relate to their English literacy performance in kindergarten?

Table 2 depicts the summary statistics and the effect sizes for students in kindergarten. The three comparison groups were Cohort 0, Cohort 1, and Cohort 2. Cohort 0 represented students who did not receive phonics instruction, cohort 1 represented students who received one year of phonics instruction in Senior Kindergarten and cohort 2 represented students who received two years of phonics instruction in Junior Kindergarten and Senior Kindergarten. The tests were administered while students were in Senior Kindergarten, during the middle of the school year. The mean composite scores increased from 72.83 with no phonics to 130.18 with one year of phonics and 152.53 with two years of phonics. There was a large significant difference in early literacy scores between cohort 0 and cohort

Table 3 Students classified at-risk on composite scores

	Cohort 0	Cohort 1	Cohort 2
Percentage of students at/ above benchmark	13.33% (n=22)	55.55% (n=130)	71.93% (n=164)
Percentage of students below benchmark	22.42% (n=37)	22.22% (n=52)	14.47% (n=33)
Percentage of students well below benchmark	64.24% (n=106)	22.22% (n=52)	13.60% (n=31)

Table 4 Students classified at-risk on first sound fluency

	Cohort 0	Cohort 1	Cohort 2
Percentage of students at/ above benchmark	20.86% (n=34)	59.40% (n=139)	75.81% (n=163)
Percentage of students below benchmark	17.79% (n=29)	17.52% (n=41)	13.95% (n=30)
Percentage of students well below benchmark	61.35% (n=100)	23.08% (n=54)	10.23% (n=22)

1 ($d=1.19$, $p<0.01$) and cohort 0 and cohort 2 ($d=1.42$, $p<0.01$), respectively, that indicated more than a standard deviation of difference. However, we observed a smaller effect size while comparing early literacy scores between cohorts 1 and 2 ($d=0.35$, $p<0.01$). These results were consistent for individual subtests such as phoneme segmentation fluency, first sound fluency and nonsense word fluency.

Kindergarten Risk Status

Our second research question states:

How did the number of years that students received phonics instruction in preschool relate to the incidence of them being at-risk for not meeting grade-level English literacy benchmarks in kindergarten?

Table 2 depicts the number and percentage of students classified as being “well below benchmark”, “below benchmark” and “at or above benchmark” on composite scores across the three cohorts of students tested in kindergarten: Cohort 0 (no phonics), Cohort 1 (one year of phonics) and Cohort 2 (two years of phonics). According to the DIBELSNext manual, a score that is “well below benchmark” signifies need for intensive support, “below benchmark” signifies need for strategic support, and “at or above benchmark” signifies that the student will achieve their literacy goals with minimal support and whole-group instruction. We observed that before phonics instruction, 64.24% of students were found to be “well below benchmark” on the DIBELSNext composite score and this dropped significantly to 13.60% after two years of phonics instruction in preschool. Similarly, only 13.33% of students were found to be “at or above benchmark” on the DIBELSNext composite score before

Table 5 Students classified at-risk on phoneme segmentation fluency

	Cohort 0	Cohort 1	Cohort 2
Percentage of students at/ above benchmark	16.87% (n=28)	57.26% (n=134)	81.78% (n=175)
Percentage of students below benchmark	25.90% (n=43)	20.09% (n=47)	12.62% (n=27)
Percentage of students well below benchmark	57.23% (n=95)	22.65% (n=53)	5.61% (n=12)

Table 6 Students classified at-risk on nonsense word fluency

	Cohort 0	Cohort 1	Cohort 2
Percentage of students at/ above benchmark	20.96% (n=35)	70.09% (n=164)	83.64% (n=179)
Percentage of students below benchmark	15.57% (n=26)	20.51% (n=48)	11.68% (n=25)
Percentage of students well below benchmark	63.47% (n=105)	9.40% (n=22)	4.67% (n=10)

phonics instruction and this percentage increased significantly to 71.93% after two years of phonics instruction in preschool.

Tables 3, 4 and 5; depict the number and percentage of students classified as being “well below benchmark”, “below benchmark” and “at or above benchmark” on the first sound fluency, phoneme segmentation and nonsense word fluency subtests respectively. Students who received two years of phonics instruction were much less likely to be categorized as being at-risk of not meeting their early literacy benchmark goals, than those who experienced 0 years of the program. Between 72 and 84% of students in this cohort performed at or above the benchmark on the DIBELS Composite Reading, First Sound Fluency, Phoneme Segmentation, and Nonsense Word Fluency tests. As a result, this cohort had far fewer students performing below or well below benchmark on all the measures in comparison to the other cohorts. This difference was most evident in students’ Composite Reading scores, as shown in Table 2. As many as 87% of students who received no phonics instruction performed below or well below the benchmark cut-off point for risk, in contrast to 44% of students who received one year of the program. Further, there was a substantial difference between the cohorts who received one and two years of phonics instruction with only 28% of students in the latter group performing below or well below the benchmark. A similar pattern was found across the cohorts on all of the individual literacy skills measured - First Sound Fluency, Phoneme Segmentation, and Nonsense Word Fluency.

Discussion

Overall, phonics instruction programs in preschool were related to better early English literacy outcomes in kindergarten. Students who received one and two years of phonics instruction significantly outperformed their peers who received no phonics instruction on their kindergarten early literacy skills by over an entire standard deviation of difference ($d=1.19$, $p<0.01$; $d=1.42$, $p<0.01$), signifying a large effect size (Cohen, 1969; Kraft, 2020; Lipsey et al., 2012). With a view to benchmarking the effect sizes against observed effects from similar interventions in prior literature (Hill et al., 2008), we compared the results from our study with those from a meta-analysis of 66 data sets from 38 studies of phonics instruction programs by the US National Reading Panel (Ehri et al., 2001). These prior studies revealed that the overall effect of phonics instruction on early literacy skills was $d=0.41$, with a slightly higher effect observed for programs that began in early childhood ($d=0.55$). The effect sizes between groups who received phonics instruction and those who did not at ABC English Medium School were two to three times the magnitude of the results from the US National Reading Panel data.

Moreover, exposure to phonics instruction was related with better early English literacy outcomes for students at-risk for reading difficulties at ABC English Medium School. We found that students were eight times more likely to be classified as being “well below benchmark” in kindergarten if they did not receive phonics instruction in preschool, and eight times more likely to be classified “at or above benchmark” if they did receive phonics instruction in preschool. The research underpinning the DIBELS literacy benchmarking assessments suggests that students who are classified as “at or above benchmark” have a higher likelihood of achieving later reading goals if they receive effective core reading instruction, while students who have scores below the benchmark have a lower probability of achieving later reading goals without additional targeted support (Good et al., 2011, 2013). Explicit and systematic phonics instruction can remediate and prevent reading disabilities for both monolingual students (Torgesen, 2000) and English learners (Gersten & Baker, 2003), and this is especially true if students are instructed in these skills in preschool and kindergarten (Ehri et al., 2001).

We also found an effect size of 0.36 for the difference in English literacy skills between students who received one year and two years of phonics, which was a significant finding in this context given its implications for the recommended dosage of such programs. Though this would be considered a small to medium effect size according to Cohen’s effect size benchmarks (Ehri et al., 2001), recent large meta-analyses of data from thousands of experimental

studies in the educational field propose that any effect size of more than 0.20 can be regarded as large for an educational intervention (Kraft, 2020; Lipsey et al., 2012).

Implications for Research

Our study adds further evidence to the extant literature (Dixon et al., 2011; Schagen & Shamsan, 2007) on the student outcomes related to the introduction of English phonics-based instruction in the context of Indian schooling. However, considering the exceptional linguistic, cultural, geographic, and socio-economic diversity experienced in India, more studies from different contexts will help generalize findings on student foundational reading skills and their relation with the implementation of phonics-based programs to address the school-level literacy performance problem being faced by the country. There is an immense need to introduce empirically-validated reading instruction in preschools in India and we propose a move away from the Alphabet-Spelling method (Gupta, 2014) to phonics-based instructional programs in order to improve early literacy outcomes for students entering kindergarten.

Moreover, providing students with explicit reading instruction is an intermediate step in preventing school failure and aids in the early identification of students who are at-risk for reading difficulties (Torgesen, 2000, Torgesen et al., 2003). Continuing to teach reading using the Alphabet-Spelling method (Gupta, 2014), which bypasses letter-sound correspondences and focuses on sight-word recognition, creates a cognitive overload for students learning to read, and they are forced to treat each unfamiliar new word as a sight word instead of sounding it out. Providing children with explicit phonics-based instruction instead helps them learn letter-sound correspondences, and decoding new words is a more effective reading strategy than committing it to memory (Miciak & Fletcher, 2020). A dire consequence of inadequate reading instruction is that it is intrinsically linked to students being misidentified as having dyslexia and other learning disabilities (Miciak & Fletcher, 2020). An important exclusionary clause in identifying learning disabilities is ruling out environmental factors, especially access to inadequate reading instruction. Systematic phonics instruction programs are the most commonly used programs to remediate reading difficulties and if all students are not provided access to these programs, it becomes more difficult to parse out poor reading outcomes as a consequence of poor reading instruction from poor reading outcomes despite adequate reading instruction (Miciak & Fletcher, 2020). Therefore, a move-away from the alphabet-spelling method to phonics-based instructional programs would prevent the misidentification of students being at-risk for dyslexia.

Implications for Practice

It is important to note that ABC English Medium School implemented a set of complementary interventions along with the introduction of phonics to empower the teachers and create a more engaging learning environment (Zahedi et al., 2022). While strategies for improving student learning typically start with curriculum, they will rarely see success unless supported by interventions for improving teacher capacity and student engagement too (Cohen & Ball, 1999). The interaction of these three elements - curriculum, teacher capacity, and student engagement - is known as the *instructional core*, and student learning cannot improve unless all elements are worked upon (City et al., 2009). In order to address this need, the ABC English Medium School had undertaken the following initiatives to build teacher capacity: (a) Workshops on systematic phonics instruction, holistic literacy development, classroom management, designing classroom-based assessments and student portfolios, and curriculum-mapping; (b) Weekly professional learning community (PLC) meetings for teachers in grade level teams to engage in collective sensemaking of new initiatives and practices; and (c) Ongoing observation and feedback on teachers' classroom practice, and an annual performance evaluation process. Professional development efforts were aimed at improving teacher knowledge of phonics instruction but also their ability to design and implement lessons in a way that shifted from traditional teacher-centered approaches to active learning pedagogy that were more learner centered. The school also improved its student-teacher ratio from 1:24 to 1:10, and added special education support teams that work one-on-one with students diagnosed with disabilities in the classroom.

Policy Implications

First, the teaching of English in India can be traced back to the British colonial rule, more specifically to a policy known as Macaulay's Minute on Education (Macaulay, 1835), which instigated a theme of rote memorization, an absence of inquiry and critical thinking, as well as a centrally imposed curriculum. The post-colonial and independence eras saw the evolution of the English language from being a mere colonial legacy to becoming a primary language of international commerce and communication, which can be attributed to the liberalization of the Indian economy and globalization (Meganathan, 2022). Unfortunately, the Indian education system in general is still geared towards rote memorization of all subject areas, including reading. A move-away from the alphabet-spelling method to empirical phonics-based instructional programs would be a first step in improving reading outcomes for students and

building strong foundational literacy skills by shifting the focus from rote memorization to understanding the science of reading.

Second, given the three-language policy (Aggarwal, 1991) followed in Indian schools, and the push towards English-medium education in private schools, literacy in India is a social problem with huge disparities across regions, gender, urban and rural populations (Sinha, 2010). While students in our sample from middle-income homes come from various home language backgrounds, they have access to strong English role models at home and school, which is not the case for students coming from low-income homes, who are subjected to learning both the language and academic content at the same time (Goldenberg, 2008). In a recent study (Shenoy et al., *in press*), researchers found that when children moved from learning to read in early elementary grades to reading to learn in later elementary grades, SES became a stronger predictor of reading. They found that while students in Grade 1 in low-income communities would potentially benefit from phonics-based instruction alone to counter their reading difficulties, this would not suffice as students progressed through elementary grades. This finding can be corresponded to several key findings that have already been established: (a) Phonics-based instruction seems to be most effective for students in Grades K-1 and the benefits seem to decrease as students move through elementary grades (Foorman, 1997; Cunningham, 1990); (b) Background knowledge plays an important role as students use their reading skills to comprehend content area skills (Nation, 2005; Catts, 2009); (c) SES influences reading acquisition as impoverished families provide their children with fewer literacy-based opportunities at home than more affluent peers (Hart & Risley, 1995); (d) Finally, reading fluency gaps become more profound as children move through elementary grades if they are not prevented early on (Torgesen, 2004). Our paper's significant contribution to this literature extends our knowledge in the field by shedding light on the implications of implementing phonics-based instruction programs in middle-cost schools in the Indian context. Our hope is that these programs extend to other schools and settings in India, including low-cost private schools, in both urban and rural settings.

Limitations and Future Directions

This exploratory study offers preliminary support for the use of synthetic phonics programs to teach English reading in preschool in the Indian context. Future research is warranted to rigorously evaluate the efficacy of synthetic phonics programs by including a larger sample size, locally-normed measures, and randomized controlled studies to improve

the fidelity of implementation procedures. First, this data reports on only one school in Mumbai, and with a limited sample of approximately 600 students. Prior studies on the outcomes of phonics-based programs in India face a similar limitation, by virtue of them choosing limited samples of students from a specific school within a single city (Dixon et al., 2011; Nishanimut et al., 2013; Schagen & Shamsan, 2007). More data is required from other schools in the city and other parts of India to generalize the findings of these studies. Second, the school made significant systems level changes to support the implementation of phonics in their pre-primary grades; some of which were mentioned in the previous section above (Zahedi et al., 2022). In addition to systematic phonics implementation, these other changes might have aided in the student outcomes that we observed in kindergarten.

Third, the DIBELSNext reading assessment was normed in the US and it has been criticized by researchers in the field for being used as a stand-alone measure of reading ability and for motivating teachers to teach to the test rather than employ appropriate reading strategies (Gabriel & Paulus, 2015; Allington, 2005; Goodman, 2006; Manzo 2005; Shanahan, 2007; Tierney & Thome, 2006). The school in our study utilized DIBELSNext for two reasons: (a) they did not have access to other measures that assessed grade-level phonological processing skills in English, and (b) they did not have access to reading progress-monitoring tools developed in the Indian context. However, tools designed for the Indian context are now emerging in scholarly literature. For example, Rao et al., (2021) introduced the Dyslexia Assessment for the Languages of India (DALI) assessment tool that has both progress-monitoring tools and a dyslexia screener that is normed on the Indian population. More recently, a literacy-based application called FABLE has been developed for the Indian context that complements the DIBELS but introduces reading passages from Indian textbooks (Misquitta et al., 2022). DALI and FABLE show potential of being contextually relevant substitutes for Western-normed CBMs, and the growing pool of research validating them should be followed carefully to consider future use in foundational literacy related studies in the Indian context. Lastly, there was an absence of randomized control or comparison grouping, posing threats to the internal validity of our study, and not allowing us to make claims of causality between phonics instruction and student reading outcomes (Shadish et al., 2002; Flannelly et al., 2018; Kirk, 2012; Krishnan, 2021).

Conclusion

The use of a phonics-based instructional program at ABC English Medium School was related to (a) better English early literacy outcomes for all students as they entered kindergarten, and (b) a reduction in the number of students identified as being at-risk for not meeting English literacy benchmarks. This study makes an important contribution to the scarce literature on the outcomes of phonics-based instructional programs in the Indian schooling context, and presents one way of supporting the National Education Policy's goal of improving foundational literacy as "an urgent national mission" (Ministry of Human Resource Development, 2020, p. 8).

Funding There is no funding associated with this project.

Data Availability Data is available upon reasonable request.

References

- Aggarwal, S. (1991). *Three language formula: An educational problem*. Gyan Publishing House
- Allington, R. L. (2005). What counts as evidence in evidence-based education. *Reading Today*, 23(3), 16.
- Annamalai, E. (2004). Medium of power: The question of English in education in India. In Tolleson, J. W. & Tsui, A. B. M. (Eds.), *Medium of instruction policies: Which agenda? Whose agenda?* (177–194). Erlbaum.
- ASER Centre (2016). *Annual Status of Education Report (Rural) 2016*. http://img.asercentre.org/docs/Publications/ASER%20Reports/ASER%202016/aser_2016.pdf
- ASER Centre (2018). *Annual Status of Education Report (Rural) 2018*. <http://img.asercentre.org/docs/ASER%202018/Release%20Material/aserreport2018.pdf>
- Baker, C. (2017). Quantitative research designs: Experimental, quasi-experimental, and descriptive. *Evidence-based practice: An integrative approach to research, administration, and practice* (pp. 155–183). http://samples.jblearning.com/9781284101539/9781284101539_CH06_Drummond.pdf
- Banerjee, A. V., & Dufló, E. (2011). Why aren't children learning. *Development Outreach*, 13(1), 36–44. https://doi.org/10.1596/1020-797x_13_1_36
- Buckingham, J., Wheldall, R., & Wheldall, K. (2019). Systematic and explicit phonics instruction: A scientific, evidence-based approach to teaching the alphabetic principle. In R. Cox, S. Feez, & L. Beveridge (Eds.), *The alphabetic principle and beyond* (pp. 49–67). Primary English Teaching Association Australia.
- Burke, M. D., Hagan-Burke, S., Kwok, O., & Parker, R. (2009). Predictive validity of early literacy indicators from the middle of kindergarten to second grade. *The Journal of Special Education*, 42(4), 209–226.
- Castles, A., Rastle, K., & Nation, K. (2018). Ending the reading wars: Reading acquisition from novice to expert. *Psychological Science in the Public Interest*, 19(1), 5–51. <https://doi.org/10.1177/1529100618772271>
- Catts, H. W., Petscher, Y., Schatschneider, C., Sittner Bridges, M., & Mendoza, K. (2009). Floor effects associated with universal screening and their impact on the early identification of reading

- disabilities. *Journal of learning disabilities*, 42(2), 163–176. <https://doi.org/10.1177/0022219408326219>
- Centre For Civil Society (2017). *Report on Budget Private Schools in India*. https://ccs.in/sites/default/files/attachments/BPS_Full_Report.pdf
- City, E. A., Elmore, R. F., Fiarman, S. E., & Teitel, L. (2009). *Instructional rounds in education* (Vol. 30). Harvard Education Press.
- City EA, Elmore RF, Fiarman SE and Teitel L (2009) *Instructional rounds in education* (Vol. 30). Cambridge, MA: Harvard Education Press.
- Cohen, D. K., & Ball, D. L. (1999). *Instruction, capacity, and improvement*. <https://doi.org/10.1037/e382692004-001>
- Cohen, R. A. (1969). Conceptual styles, culture conflict, and nonverbal tests of intelligence. *American Anthropologist*, 71(5), 828–856. <https://doi.org/10.1037/e382692004-001>
- Cunningham, A. E. (1990). Explicit versus implicit instruction in phonemic awareness. *Journal of experimental child psychology*, 50(3), 429–444.
- de Graaff, S., Bosman, A. M., Hasselman, F., & Verhoeven, L. (2009). Benefits of systematic phonics instruction. *Scientific Studies of Reading*, 13(4), 318–333. <https://doi.org/10.1080/10888430903001308>
- Dixon, P., Schagen, I., & Seedhouse, P. (2011). The impact of an intervention on children's reading and spelling ability in low-income schools in India. *School Effectiveness and School Improvement*, 22(4), 461–482. <https://doi.org/10.1080/09243453.2011.625125>
- Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*, 34(9), 917–928. <https://doi.org/10.1093/jpepsy/jsp004>
- Ehri, L. C. (2020). The science of learning to read words: A case for systematic phonics instruction. *Reading Research Quarterly*, 55, S45–S60. <https://doi.org/10.1002/rrq.334>
- Ehri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. *Review of Educational Research*, 71(3), 393–447. <https://doi.org/10.3102/00346543071003393>
- Elliott, J., Lee, S. W., & Tollefson, N. (2001). A reliability and validity study of the Dynamic Indicators of Basic Early Literacy Skills—Modified. *School Psychology Review*, 30(1), 33–49.
- Foorman, B. R. (1997). Early interventions for children with reading problems: study designs and preliminary findings. *Learning Disabilities: A Multidisciplinary Journal*, 8(1), 63–71.
- Flannelly, K. J., Flannelly, L. T., & Jankowski, K. R. (2018). Threats to the internal validity of experimental and quasi-experimental research in healthcare. *Journal of Health Care Chaplaincy*, 24(3), 107–130.
- Gabriel, R., & Paulus, T. (2015). Committees and controversy: Consultants in the construction of education policy. *Educational Policy*, 29(7), 984–1011. <https://doi.org/10.1177/0895904814531650>
- Gersten, R., & Baker, S. (2003). English-language learners with learning disabilities. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 94–109). The Guilford Press.
- Glewwe, P., Kremer, M., & Moulin, S. (2009). Many children left behind? Textbooks and test scores in Kenya. *American Economic Journal: Applied Economics*, 1(1), 112–135. <https://doi.org/10.1257/app.1.1.112>
- Goffreda, C. T., Diperna, J. C., & Pedersen, J. A. (2009). Preventive screening for early readers: Predictive validity of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). *Psychology in the Schools*, 46(6), 539–552.
- Goldenberg, C. (2008). *Teaching English language learners: What the research does-and does not-say*. <https://digitalcommons.georgia-southern.edu/esed5234-master/27>
- Good, R. H., Kaminski, R. A., & Cummings, K. (2011). *DIBELS next*. Cambium Learning.
- Good, R. H., Kaminski, R. A., Dewey, E. N., Wallin, J., Powell-Smith, K. A., & Latimer, R. J. (2013). *DIBELS Next technical manual*. Eugene.
- Good, R. H., Kaminski, R. A., Shinn, M., Bratten, J., Shinn, M., Laimon, D., & Flindt, N. (2004). Technical adequacy of DIBELS: Results of the Early Childhood Research Institute on measuring growth and development. Eugene, OR: University of Oregon.
- Goodman, K. S. (2006). A critical review of DIBELS. In K. S. Goodman (Ed.), *The truth about DIBELS: What it is, what it does* (pp. 1–39). Heinemann.
- Gupta, R. (2014). Change in Teaching Practices: Case of Phonics Instruction in India. *Procedia-Social and Behavioral Sciences*, 116, 3911–3915. <https://doi.org/10.1016/j.sbspro.2014.01.865>
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Paul H Brookes Publishing.
- Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2008). Empirical benchmarks for interpreting effect sizes in research. *Child Development Perspectives*, 2(3), 172–177. <https://doi.org/10.1111/j.1750-8606.2008.00061.x>
- Hintze, J. M., Ryan, A. L., & Stoner, G. (2003). Concurrent validity and diagnostic accuracy of the dynamic indicators of basic early literacy skills and the comprehensive test of phonological processing. *School Psychology Review*, 32(4), 541–556.
- Jasuja, N., & Khan, N. (2017). *India's fintech boom: Ensuring no man is left behind as the sector races Along*. Medium. <https://medium.com/wharton-fintech/indias-fintech-boom-ensuring-no-man-is-left-behind-as-the-sector-races-along-64ce5d631a65>
- Johnson, B. (2001). Toward a new classification of nonexperimental quantitative research. *Educational Researcher*, 30(2), 3–13. <https://doi.org/10.3102/0013189x030002003>
- Johnston, R. S., McGeown, S., & Watson, J. E. (2012). Long-term effects of synthetic versus analytic phonics teaching on the reading and spelling ability of 10 year old boys and girls. *Reading and Writing*, 25(6), 1365–1384. <https://doi.org/10.1007/s11145-011-9323-x>
- Johnston, R. S., & Watson, J. E. (2005). *The effects of synthetic phonics teaching on reading and spelling attainment: A seven year longitudinal study* (11 vol.). Edinburgh: Scottish Executive. <http://www.gov.scot/Publications/2005/02/20688/52449>
- Joshi, R. M., Nakamura, P. R., & Singh, N. C. (2017). Reading research and practice: Indian perspective. *New directions for Child and Adolescent Development*, 2017(158), 43–53. <https://doi.org/10.1002/cad.20222>
- Karande, S., Sholapurwala, R., & Kulkarni, M. (2011). Managing specific learning disability in schools in India. *Indian Pediatrics*, 48(7), 515–520. <https://doi.org/10.1007/s13312-011-0090-1>
- Kirk, R. E. (2012). Experimental design: Procedures for the behavioral sciences. *Sage Publications*. <https://doi.org/10.4135/9781483384733>
- Kraft, M. A. (2020). Interpreting effect sizes of education interventions. *Educational Researcher*, 49(4), 241–253. <https://doi.org/10.3102/0013189x20912798>
- Krishnan, P. (2021). A review of the non-equivalent control group posttest-only design. *Nurse Researcher*, 29(2).
- Kurrien, J. (2005). Notes for the Meeting of the National Focus Group on Teaching of English, and Note on Introduction of English at the Primary Stage. *Ms., NFG-English*.
- Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., & Busick, M. D. (2012). *Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms*. National Center for Special Education Research.

- Macaulay, T. B. (1835). Minute on Education (1835) by Thomas Babington Macaulay. Retrieved from http://www.columbia.edu/itc/mealac/pritchett/00generallinks/macaulay/txt_minute_education_1835.html
- Manzo, K. K. (2005). National clout of DIBELS test draws scrutiny. *Education Week*, 25(5), 1–2.
- Meganathan, R. (2011). Language Policy in Education and the Role of English in India: From Library Language to Language of Empowerment. British Council.
- Meganathan, R. (2022). Language Conundrum: English Language and Exclusivity in India's Higher Education. In *Critical Sites of Inclusion in India's Higher Education* (pp. 81–96). Palgrave Macmillan, Singapore.
- Mesmer, H. A. E., & Griffith, P. L. (2005). Everybody's selling it—But just what is explicit, systematic phonics instruction? *The Reading Teacher*, 59(4), 366–376. <https://doi.org/10.1598/rt.59.4.6>
- Miciak, J., & Fletcher, J. M. (2020). The critical role of instructional response for identifying dyslexia and other learning disabilities. *Journal of Learning Disabilities*, 53(5), 343–353. <https://doi.org/10.1177/0022219420906801>
- Ministry of Human Resource Development (2014). *All India survey on higher education: 2014*. https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/AISHE2014-15.pdf
- Ministry of Human Resource Development (2018). *All India survey on higher education: 2018*. https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/AISHE%20Final%20Report%202018-19.pdf
- Ministry of Human Resource Development Department of School Education and Literacy (2019). “*Unified District Information System for Education*.”#8221
- Ministry of Human Resource Development (2020). *National Education Policy: 2020*. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Misquitta, R., Shenoy, S., Ghosh, A., & Kotwal, N. (2022). Examining the technical adequacy and efficacy of FABLE to identify students at-risk for reading difficulties in India. *Asia Pacific Education Review*, 23(3), 1–11. <https://doi.org/10.1007/s12564-022-09751-y>
- MoSPI (2019). EDUCATION - Statistical Year Book India 2019. <http://mospi.nic.in/statistical-year-book-india/2019/198>
- Munger, K. A., LoFaro, S. A., Kawryga, E. A., Sovocool, E. A., & Medina, S. Y. (2014). Does the dynamic indicators of basic early literacy skills next assessment take a “simple view” of reading? *Educational Assessment*, 19(3), 204–228. <https://doi.org/10.1080/10627197.2014.934609>
- Nation, K. (2005). Children's Reading Comprehension Difficulties. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248–265). Blackwell Publishing. <https://doi.org/10.1002/9780470757642.ch14>
- National Council of Educational Research and Training (2011). *NCERT Annual Report 2011-12*. <https://ncert.nic.in/pdf/annualreport/Annual-Report-2011-12.pdf>
- National Council of Educational Research and Training (2014). *National Achievement Survey (Cycle 3), Class III: Achievement highlights*. https://ncert.nic.in/pdf/NAS/NAS_Class3.pdf
- National Institute for Literacy (2008). *Developing early literacy: Report of the National Early Literacy Panel*. <https://lincs.ed.gov/publications/pdf/NELPReport09.pdf>
- National Reading Panel (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*.
- Nishanimut, S. P., Johnston, R. S., Joshi, R. M., Thomas, P. J., & Padakannaya, P. (2013). Effect of synthetic phonics instruction on literacy skills in an ESL setting. *Learning and Individual Differences*, 27, 47–53. <https://doi.org/10.1016/j.lindif.2013.06.007>
- Patel, P., Torppa, M., Aro, M., Richardson, U., & Lyytinen, H. (2018). GraphoLearn India: The effectiveness of a computer-assisted reading intervention in supporting struggling readers of English. *Frontiers in Psychology*, 9, 1045. <https://doi.org/10.3389/fpsyg.2018.01045>
- Pritchett, L., & Beatty, A. (2012). The negative consequences of over-ambitious curricula in developing countries. *Center for Global Development Working Paper*, (293). <https://doi.org/10.2139/ssrn.2235869>
- Ramanathan, H. (2008). Testing of English in India: A developing concept. *Language Testing*, 25(1), 111–126. <https://doi.org/10.1177/0265532207083747>
- Ramanathan, H., & Bruning, M. D. (2003). Reflection on Teaching Oral English Skills in India: A Research Report. *Journal of the International Society for Teacher Education*, 7(1), 48–55.
- Rao, C., Sumathi, T. A., Midha, R., Oberoi, G., Kar, B., Khan, M., & Singh, N. C. (2021). Development and standardization of the DALI-DAB (dyslexia assessment for languages of India–dyslexia assessment battery). *Annals of Dyslexia*, 1–19. <https://doi.org/10.1007/s11881-021-00227-z>
- Ratti, L. (2015). Special Training Centres (STC) in MCD Schools: A Perspective on Curricular Issues and Reflective Practices. *International Journal of Scientific & Engineering Research*.
- Riedel, B. W., & Samuels, S. J. (2007). The relation between DIBELS, reading comprehension and vocabulary in urban first grade students. *Reading Research Quarterly*, 42, 546–567. Retrieved from <http://www.jstor.org/stables/20068316>
- Roehrig, A. D., Petscher, Y., Nettles, S. M., Hudson, R. F., & Torgesen, J. K. (2008). Accuracy of the DIBELS oral reading fluency measure for predicting third grade reading comprehension outcomes. *Journal of School Psychology*, 46(3), 343–366. <https://doi.org/10.1016/j.jsp.2007.06.006>
- Rouse, H. L., & Fantuzzo, J. W. (2006). Validity of the DIBELS as an indicator of early literacy for urban kindergarten children. *School Psychology Review*, 35(3), 341–355. <https://doi.org/10.1080/02796015.2006.12087971>
- Saini, A. (2000). Literacy and empowerment: An Indian scenario. *Childhood Education*, 76(6), 381–384. <https://doi.org/10.1080/0094056.2000.10521186>
- Schagen, I., & Shamsan, Y. (2007). Analysis of Hyderabad Data from “Jolly Phonics” Initiative to Investigate Its Impact on Pupil Progress in Reading and Spelling—India. *National Foundation for Educational Research*. <https://files.eric.ed.gov/fulltext/ED502371.pdf>
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton, Mifflin and Company.
- Shanahan, T. (2007). More ideas not everyone will like. *Reading Today*, 24(4), 18.
- Sharma, R., & Ramachandran, V. (Eds.). (2009). *The elementary education system in India: Exploring institutional structures, processes and dynamics*. Routledge
- Shenoy, S., Wagner, R. K., & Rao, N. M. (2020). Factors that influence reading acquisition in L2 English for students in Bangalore, India. *Reading and Writing: An Interdisciplinary Journal*, 33(7), 1809–1838. <https://doi.org/10.1007/s11145-020-10047-z>
- Shenoy, S., Wagner, R. K., Overton, K., & Rao, N. M. (in press). L2 English reading acquisition for students in elementary grades: Growth trajectory and impact of gender, socioeconomic status and curriculum. *Languages Special Issue: Second Language Reading Acquisition in Languages with Different Writing Systems*.
- Sinha, S. (2010). Literacy instruction in Indian schools. *Education for sustainable development*, 117–128.
- Stahl, S. A. (2001). Teaching phonics and phonological awareness. *Handbook of early literacy research Vol. 1*, 333–347.

- Stuart, M. (1999). Getting ready for reading: Early phoneme awareness and phonics teaching improves reading and spelling in inner-city second language learners. *British Journal of Educational Psychology*, 69(4), 587–605. <https://doi.org/10.1348/000709999157914>
- Stuart, M. (2004). Getting ready for reading: A follow-up study of inner city second language learners at the end of Key Stage 1. *British Journal of Educational Psychology*, 74(1), 15–36. <https://doi.org/10.1348/000709904322848806>
- Tierney, R. F., & Thome, C. (2006). Is DIBELS leading us down the wrong path?. In K. Goodman (Ed.), *The truth about DIBELS: What it is, what it does* (pp. 50–59). Heinemann
- Torgesen, J. K. (2004). Preventing early reading failure—and its devastating downward spiral. *American Educator*, 28(3), 6–19.
- Torgerson, C., Brooks, G., & Hall, J. (2006). *A systematic review of the research literature on the use of phonics in the teaching of reading spelling*. DfES Publications.
- Torgerson, C., Brooks, G., Gascoine, L., & Higgins, S. (2019). Phonics: Reading policy and the evidence of effectiveness from a systematic ‘tertiary’ review. *Research Papers in Education*, 34(2), 208–238. <https://doi.org/10.1080/02671522.2017.1420816>
- Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research & Practice*, 15(1), 55–64. https://doi.org/10.1207/sldrp1501_6
- Tunmer, W. E., & Arrow, A. W. (2013). 12 Reading: Phonics Instruction. *International guide to student achievement* (pp. 325–328). Routledge.
- Vanderwood, M. L., Nam, J. E., & Sun, J. W. (2014). Validity of DIBELS early literacy measures with Korean English learners. *Contemporary School Psychology*, 18(4), 205–213.
- Williams, C. (2007). Research methods. *Journal of Business & Economics Research (JBER)*, 5(3), 65–72.
- Zahedi, S., Iyer, A., Jaffer, R., Shenoy, S., & Shourie, R. (2022). *A systems approach to improving foundational reading skills at a preschool in India*. [Manuscript submitted for publication]

Publisher’s Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.