FSG REIMAGINING SOCIAL CHANGE

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PIPE Impact Assessment 2020

PROGRAM TO IMPROVE PRIVATE EARLY EDUCATION (PIPE)

Glossary of terms (1/2)

- **Affordable Private Schools (APSs):** Schools that charge fees up to INR 28,500 per annum, and typically provide education up to grade 10
- **Early Childhood Education (ECE):** The formal education a child receives between the ages two through five. Typically early childhood is considered to range from birth to age six, this narrower definition has been chosen to reflect the research's interest in the years when formal pre-primary education is typically provided in India
- **English-medium education:** Education where the language of instruction is English
- **Markers:** Indicators or signs that parents use to assess whether their child is learning
  - **Markers to test recall:** Questions used by parents to assess their children for content memorized using rote methods (e.g., asking the child to recite numbers)
  - **Markers to test concepts:** Questions used by parents to assess their children's conceptual understanding of any topic (e.g., asking the child to count items)
- **Preschooling/ Pre-primary classes:** All formal educational classes prior to first grade
- **Program to Improve Private Early Education (PIPE):** Program that aims to replace rote with activity based learning in all 300,000 APSs in India
- **Activity based learning (ABL):** Learning through structured play-based activities, games, and experiences that provide developmental benefits across the cognitive, physical, and socio-emotional domains
- **ABL solution provider:** Private companies providing ABL solutions including curriculum materials, teacher training and continuous support for proper implementation of the program
- **Partner:** Private companies that have partnered with PIPE and provide high-quality ABL solutions to APSs
- **Partner solutions:** Play/ activity based programs including curriculum materials and continuous support for proper implementation of the program, provided by PIPE partners

Glossary of terms (2/2)

- **PIPE teachers:** Teachers teaching in APSs served by PIPE partners
- **STARS:** Scoring Tool for Assessing Readiness at School to assess the impact of ABL in APSs
- **PIPE APSs:** APSs using PIPE partner solutions
- **Control APSs:** APSs using no external interventions
- **Full curriculum PIPE APSs:** PIPE APSs using full school curriculum
- **Single subject PIPE APSs:** PIPE APSs using single subject curriculum
- **1 year PIPE APSs:** APSs with partner solutions for 1 year
- **2 year PIPE APSs:** APSs with partner solutions for 2 years
- **3 year PIPE APSs:** APSs with partner solutions for 3 year
- **4 year PIPE APSs:** APSs with partner solutions for 4 years

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Objectives of the assessment

- **Independently, track impact of PIPE partners** in APSs by measuring change in the classroom environment and child learning outcomes[1]

- **Independently, track sustainability of PIPE partner solutions** by measuring administrator, teacher and parent awareness on good pedagogy and learning outcomes

1. Child learning outcomes include assessment of Sr. KG and Grade 2 children

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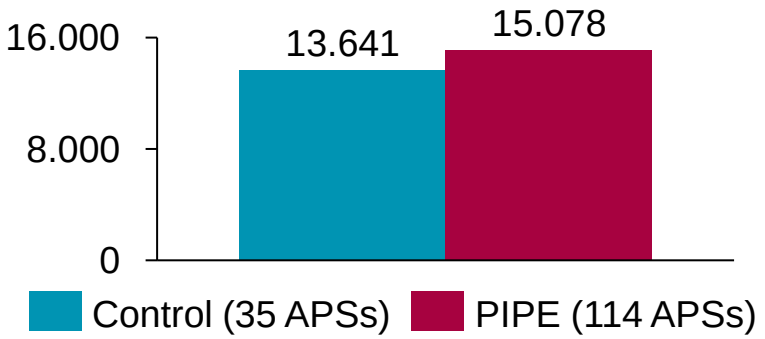
116 PIPE and 35 Control APSs, representative of the same target population, were assessed

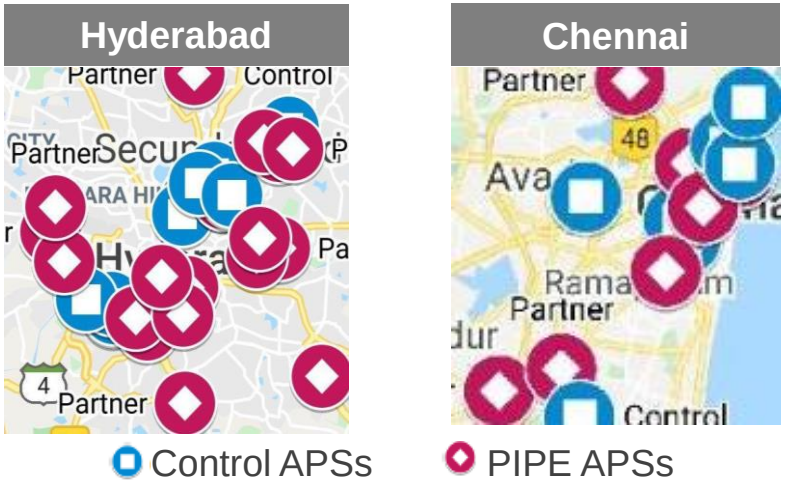
Similar segment of schools

- Private schools that are not government-aided, trust-aided or trust-funded
- Operate pre-primary to at least Grade 5
- All inclusive annual fee < INR 25,000

Similar fees[2] (INR)

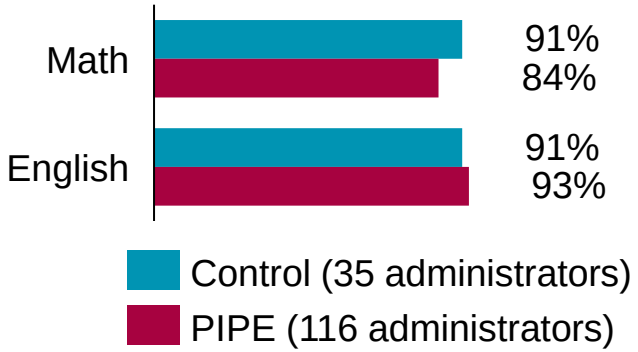


Same neighbourhood with similar parent profile[1]



Similar administrator profile[3]

% administrators that named one good way to assess learning in…



1. Indicates actual locations of the schools. Not to scale, 2. As reported by respective school administrators. Includes books, tuition fee, admission/ readmission fee, uniforms, etc. and excludes transportation. 3. Administrators were asked "How does a good teacher know if a child is learning in Math/ English?" Good response are non-recall based

Scoring Tool to Assess Readiness of Schools (STARS) was used by an independent agency to conduct the assessments

- **Developed the Scoring Tool for Assessing Readiness at School (STARS)**[1] to assess the impact and sustainability of ABL in APSs
- STARS **assesses schools across 5 key sections** – (i) classroom environment[2], (ii) Sr. KG and Grade 2 student learning outcomes[3], and interviews with (iii) administrators, (iv) teachers and (v) parents
- **Identified and signed up 151 APSs** that included
  - 116 APSs with partner solutions
  - 35 APSs with no partner solutions
- **Shortlisted and trained assessors** from Modulus Research and Analysis – selected after requesting proposals from 4 agencies
- **Ensured data consistency and accuracy** by
  - Shadowing all assessors on their first 2 assessments across all cities
  - Conducting 12 surprise spot checks at schools covering all assessors across all cities
- **Organized and analyzed the data** to identify key findings which have been listed in this document

PIPE shortlisted Modulus Research & Analysis after soliciting services from 4 agencies to conduct the impact assessment

Assessment conducted by Modulus Research & Analysis

1. To refer to the Scoring Tool for Assessing Readiness at School (STARS) (formerly known as the Preschool Assessment Tool (PAT)) and the approach to developing the tool visit STARS>>
2. Adapted ECERS R to the Indian APS context. To learn more, visit www.fsg.org/PIPE
3. Selected questions from an adapted version of IDELA for the Indian APS context. To learn more visit STARS>>

STARS contains 5 sections to track sustainability and impact of good pedagogy

	Impact		Sustainability		
Sections	**Classroom environment**	**Child learning outcomes**	**Administrator interviews**	**Teacher interviews**	**Parent interviews**
Description	• Assesses physical setup of classroom • Assesses culture through peer interactions and teacher-student engagement	• Measures child learning outcomes in numeracy, literacy and cognitive task • Assessments for end of Sr. KG and Grade 2	• Checks if administrator – Knows that good pedagogy helps learning – Shares benefits with parents	• Checks if teacher – Is trained to deliver ABL – Manages parent concerns on pedagogy – Recommends pedagogy	• Evaluates level of parent engagement • Checks parents awareness and satisfaction with the school
Rationale	• Interactions & risk-taking involved in good pedagogy happens in safe environments	• Good pedagogy improves child's understanding of concepts and learning outcomes	• Administrator understanding and buy-in is essential for continued use of good pedagogy	• Teacher capability and buy-in is essential for good implementation	• Parent understanding and buy-in is essential for continued use of good pedagogy
Example	• Teachers asks open-ended questions and responds positively	• Read "pin" (UKG) • Solve two subtraction problems (Gr 2)	• According to you, how does a good teacher teach counting?	• Has it been easy to address parent complaints about the pedagogy?	• At the end of Sr. KG/ this grade what should your child know in English?

Note- Please refer here for the detailed tool

Findings are based on assessment of 82 PIPE APSs for Sr. KG analysis, 62 PIPE APSs for grade 2 analysis and 35 control APSs

Assessment includes	117 Sr. KG classrooms	702[1] Sr. KG children	485[2] Grade 2 children	585 Sr. KG parents	117 Sr. KG teachers	151[3] administrators
PIPE APSs	82	492	310	410	82	116
Control APSs	35	210	175	175	35	35

Regions[4]: Bangalore, Chennai, Delhi, Mumbai and Hyderabad

1. Includes 352 boys and 350 girls | 2. Includes 250 boys and 235 girls | 3.Administrators include principals, owners, management in-charge, etc. |
4. Each region includes 1-2 nearby cities/towns (e.g., Bangalore would include Mysore and Mangalore)

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PIPE APSs have scored better than control APSs across all sections on the impact assessment

Improved learning outcomes

1. Sr. KG children in PIPE APSs scored 48% higher on learning outcomes as compared to control APSs
2. Sr. KG children in PIPE APSs are doing better on literacy, numeracy and cognitive tasks as compared to control APSs
3. Sr. KG children in PIPE APSs have improved by 38% across literacy, numeracy and cognitive tasks over the years
4. Grade 2 children in PIPE APSs scored 27% higher on learning outcomes as compared to control APSs

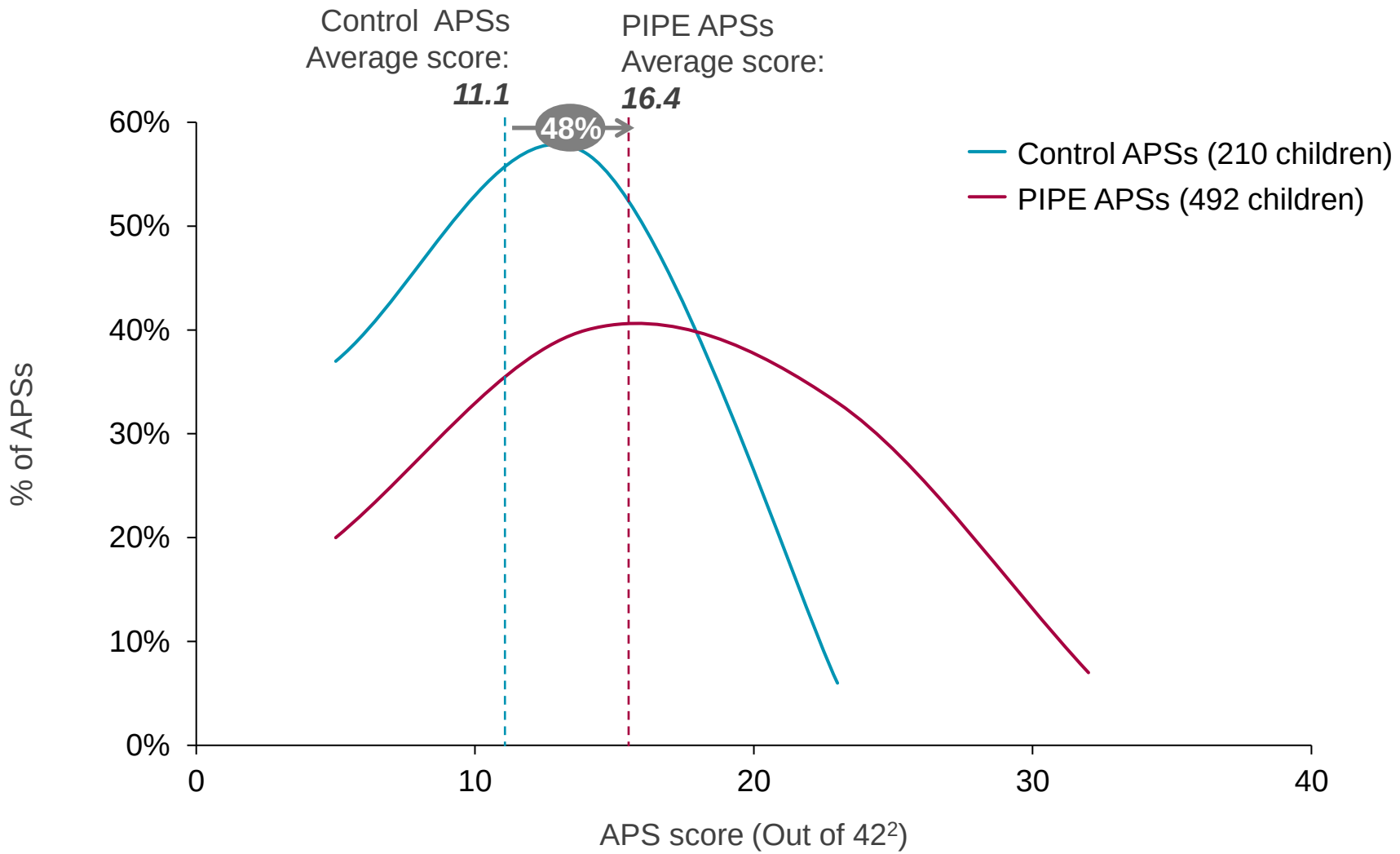
More capable teachers

5. Sr. KG classrooms in PIPE APSs are 68% better as compared to control APSs
6. Sr. KG classrooms within PIPE APSs have improved by 40% over 3+ years of implementation
7. 92% Sr. KG teachers in PIPE APSs use materials effectively to teach and reinforce concepts than in control APSs
8. Sr. KG teachers implementing ABL for 3+ years encourage dialogue in class, introduce new words and engage better

Scope for improvement

9. More Sr. KG parents in PIPE APSs recollected the name of the curriculum and raised complaints about it than in control APSs
10. There is variance among partners and potential for each partner to improve

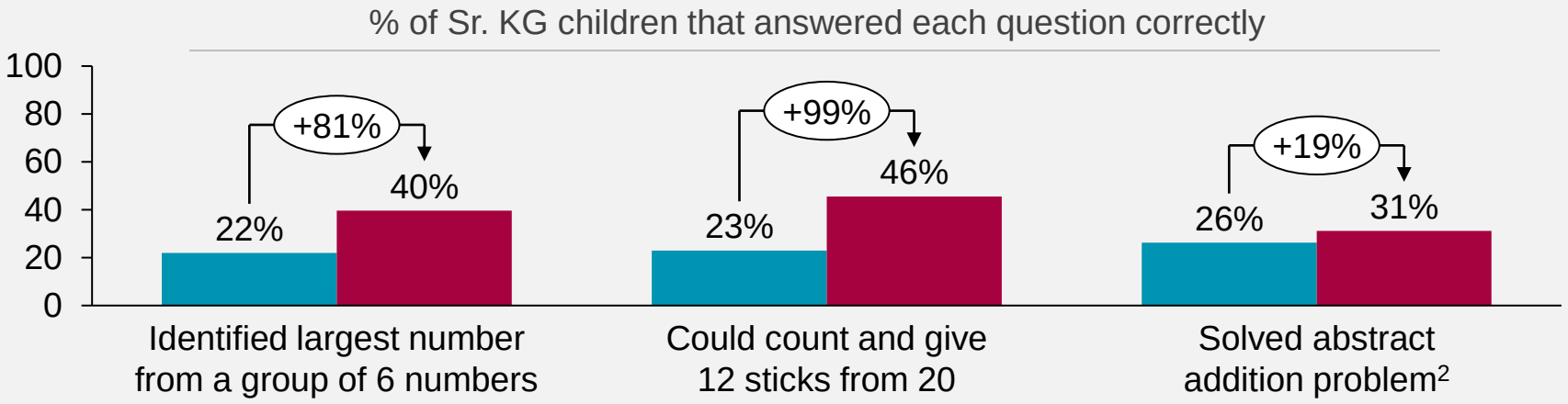
1 Sr. KG children in PIPE APSs scored 48% higher on learning outcomes as compared to control APSs



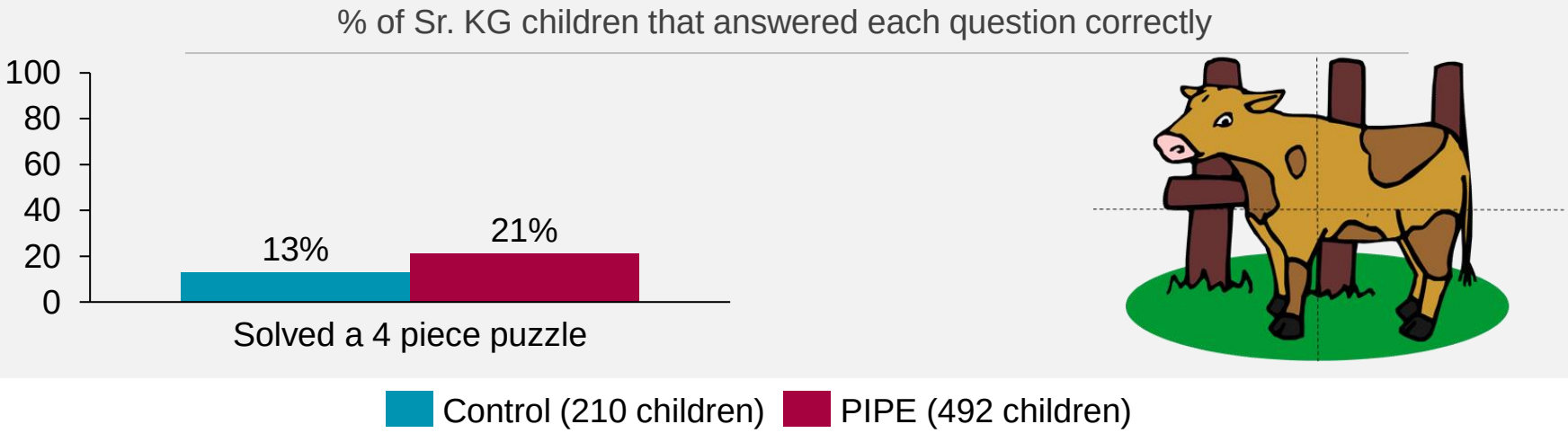
1. For score by gender please refer here
2. In each APS, 6 Sr.KG children were assessed on 7 questions, each – 3 in math and 1 each on reading, executive function, spoken English and expressive vocabulary

2 Sr. KG children in PIPE APSs are doing better on numeracy, cognitive tasks and literacy as compared to control APSs (1/2)

Children is PIPE APSs scored 66% better in numeracy as compared to control APSs[1]



Children is PIPE APSs scored 63% better in cognitive task as compared to control APSs[1]

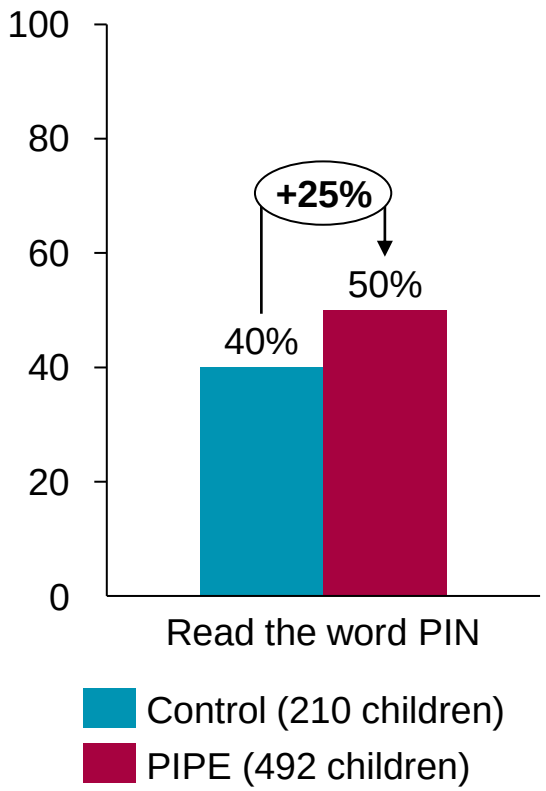


1. Overall percentage calculated based on simple average of all questions in each domain 2. Question- “There are 3 apples in this box. If I were to add 2 more, how many would be there in total?” (Show the child a picture with 3 apples)

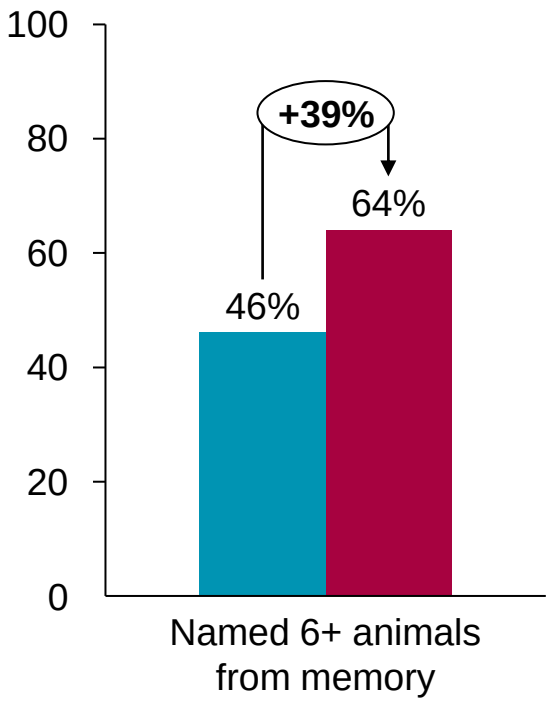
2 Sr. KG children in PIPE APSs are doing better on numeracy, cognitive tasks and literacy as compared to control APSs (2/2)

Children is PIPE APSs scored 35% better in literacy questions as compared to control APSs[1]

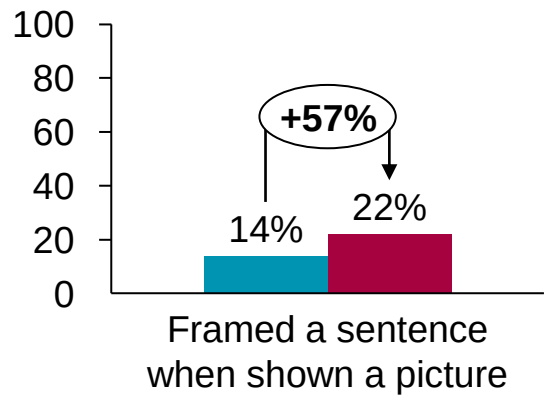
% of Sr. KG children that read a new word (PIN)



% of Sr. KG children that named 6+ animals[2]



% of Sr. KG children that framed an English sentence (noun, verb) when shown a picture[3]

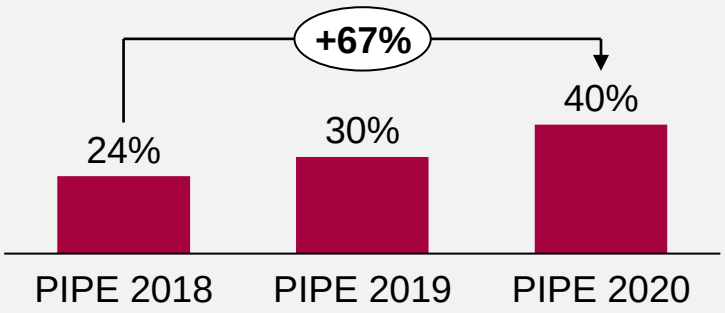


1. Overall percentage calculated based on simple average of all questions in each domain
2. This question tests the child on expressive vocabulary, therefore considered as a literacy question.
3. Child is expected to frame a simple sentence consisting of one noun and one verb (e.g., girl playing)

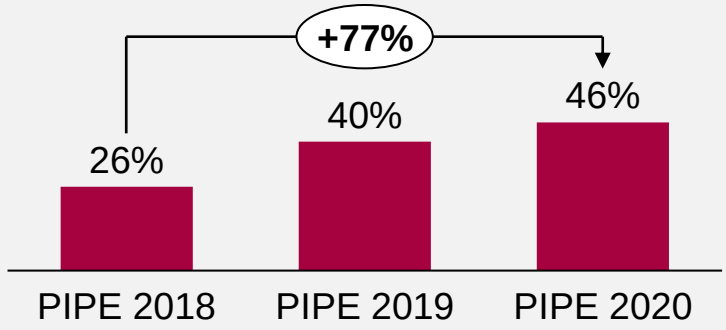
3 Sr. KG children in PIPE APSs have improved by 38% across literacy, numeracy and cognitive tasks over the years

% of Sr. KG children that answered each question correctly[1]

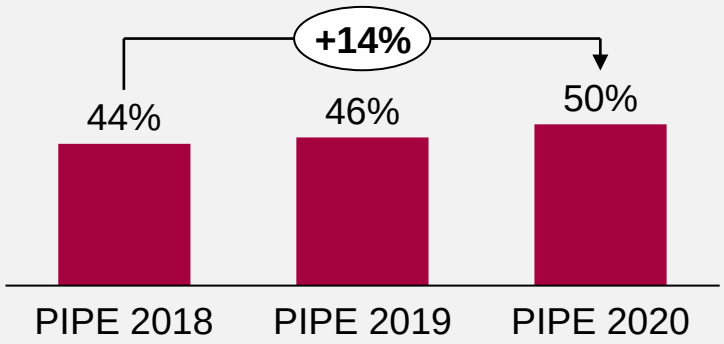
Identified largest number from a group of 6 numbers



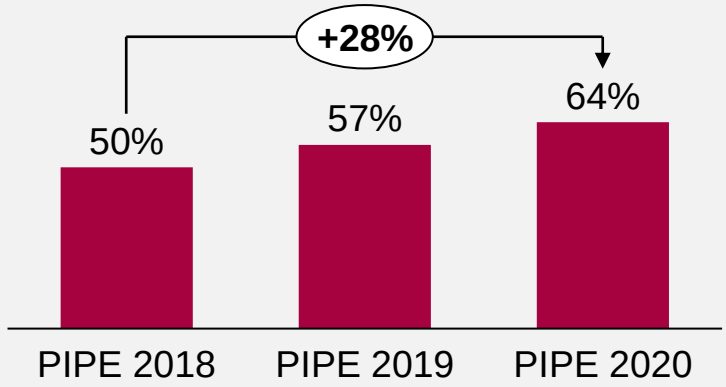
Could count and give 12 sticks from 20



Read the word PIN

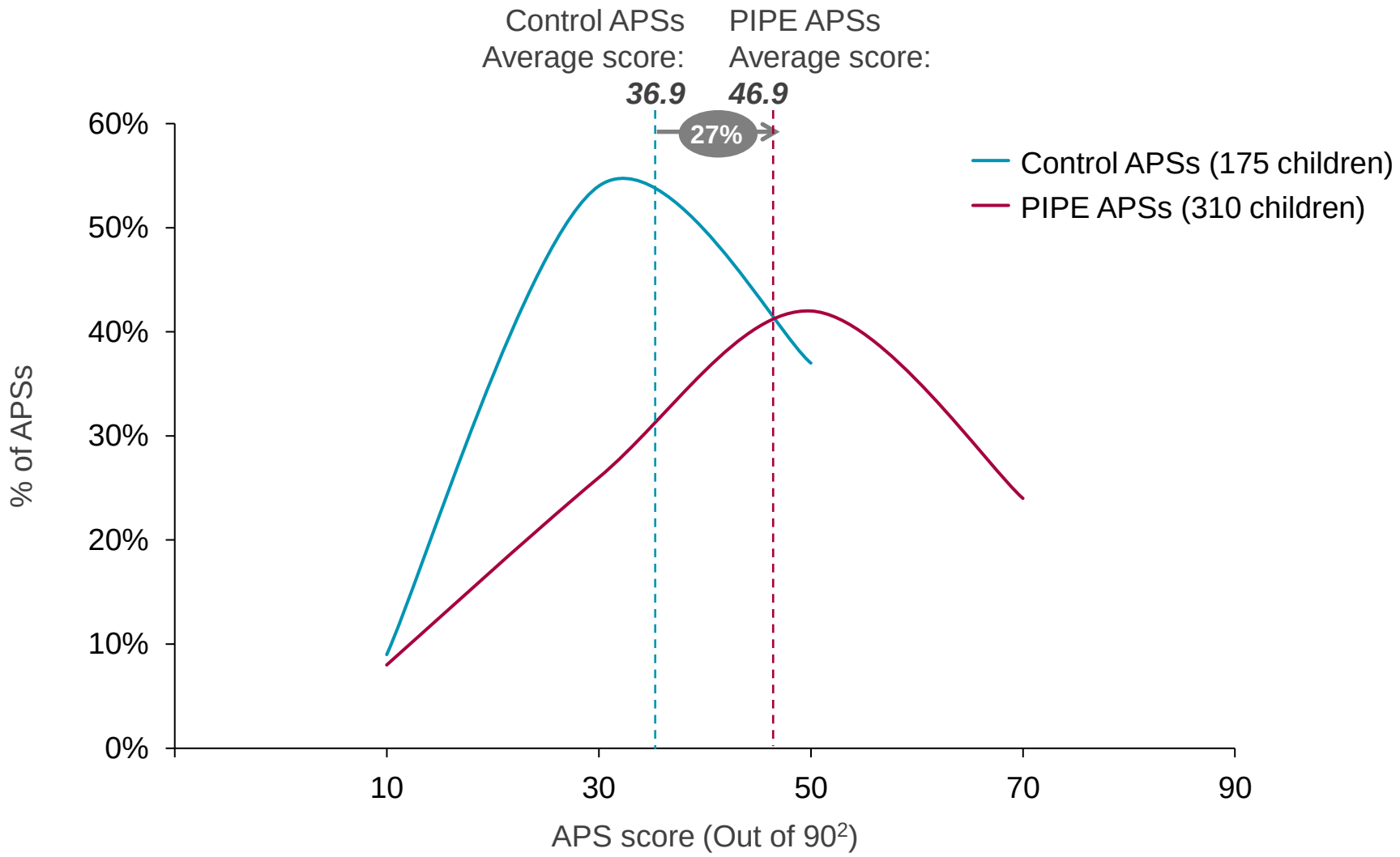


Named 6+ animals from memory



1. Represent questions that were assessed in 2018, 2019 and 2020 ; Sample sizes: PIPE 2018 (190 children), PIPE 2019 (636 children), PIPE 2020 (492 children)

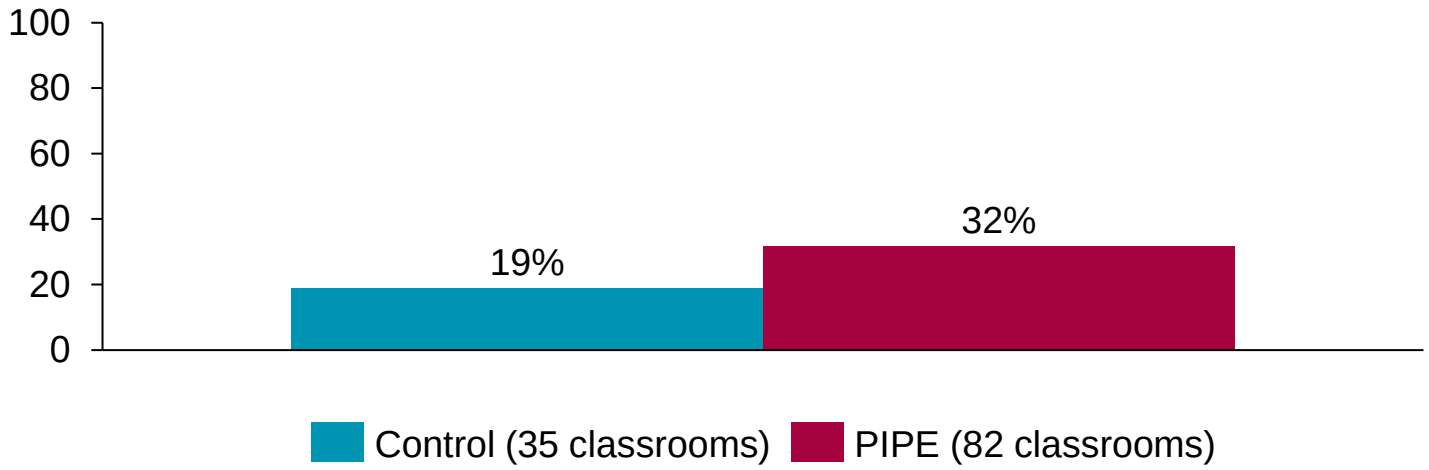
4 Grade 2 children in PIPE APSs scored 27% higher on learning outcomes as compared to control APSs



1.No significant variance in scores by gender observed in PIPE and Control APSs. 2. In each APS, 5 Grade 2 children were assessed on 18 questions, each – 9 in math and 9 in English

5 Sr. KG classrooms in PIPE APSs are 68% better as compared to control APSs

Average classroom environment score (in %)



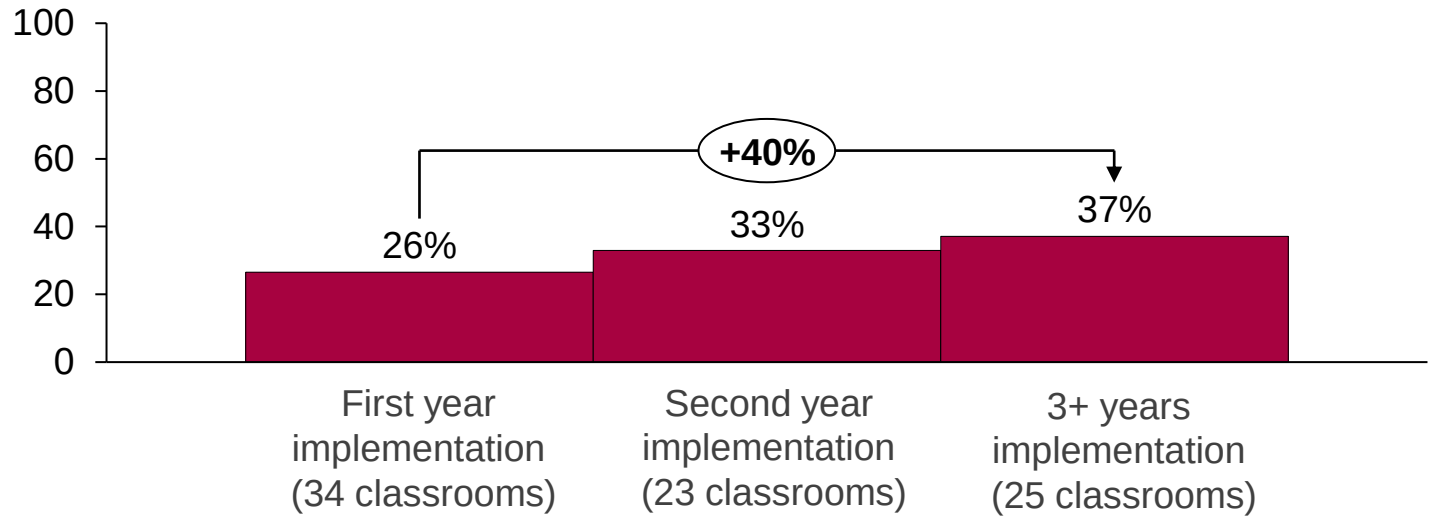
Key drivers

- Compared to classrooms in control APSs, PIPE APSs are doing better by
  - 94% as teachers **respond positively** to children's communication and encourage them to talk more
  - 46% in having a culture of giving children **positive feedback/ reinforcement**
  - 46% in **utilization of space** for children to engage in individual and group activities

1. Find the detailed break up of scores here

6 Sr. KG classrooms within PIPE APSs have improved by 40% over 3+ years of implementation

Average classroom environment score (in %)



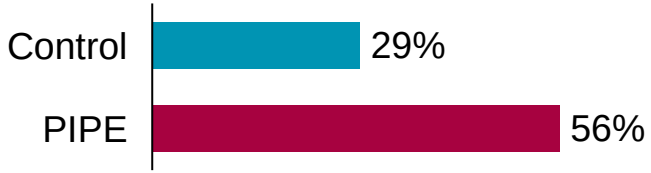
Key drivers

- In 3+ years of implementing ABL curriculum, Sr. KG PIPE teachers have improved by:
  - 2.2x in **using visual stimulations** (e.g., charts) to reinforce key concepts
  - 2.2x in **having a structured lesson plan** available during class
  - 1.5x in **effectively engaging children** during transition. For e.g., when children are moving from one lesson to the next

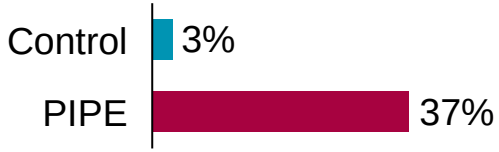
1. 3+ years implementation includes APSs implementing an ABL intervention for 3 or more years

7 92% more Sr. KG teachers in PIPE APSs use materials effectively to teach and reinforce concepts than in control APSs

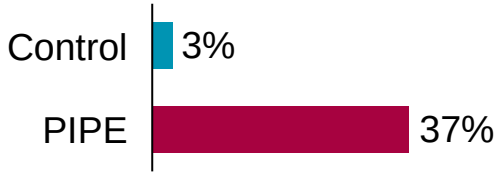
% of teachers correctly using one learning material to teach concepts



% of teachers who allow children to use a learning material, independently



% of teachers who ask children questions to test understanding of activities/ concepts being taught



Control (35 teachers) PIPE (82 teachers)

Support received by teachers from PIPE partners[1]

~6 group teacher training sessions per teacher per year

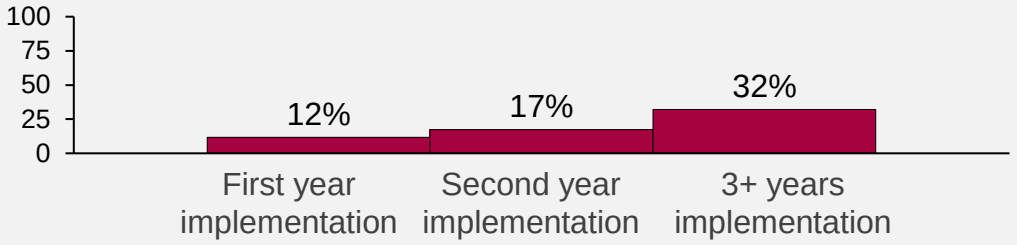
~6-8 in-class observation and feedback sessions per teacher per year

On-demand remote support over call or WhatsApp through the academic year

1. Actual support may vary by solution providers

8 In schools implementing ABL for 3+ years, more teachers encourage dialogue in class, introduce new words and engage with children better

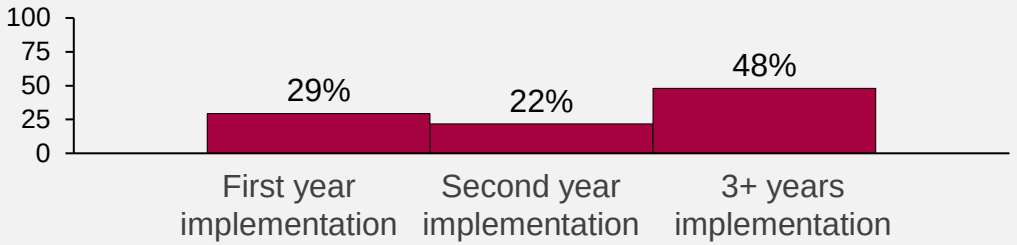
% of teachers who encourage dialogue during class



Explanation

Teacher asks children at least two open-ended questions (e.g. questions that begin with how, what if, why) and encourage them to talk more through positive reinforcement

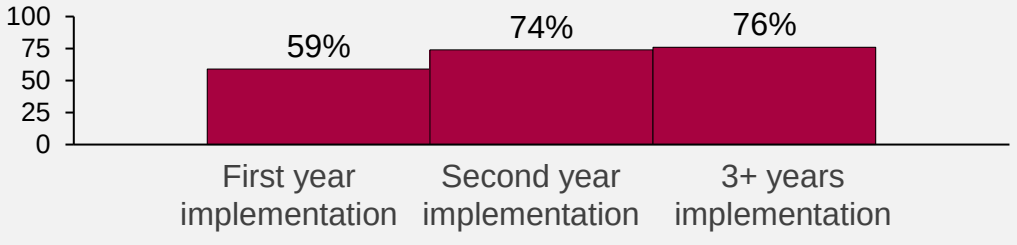
% of teachers introducing new words in class



Explanation

Teacher introduces 1-2 new words with some explanation (e.g. for the word “nib”; the teacher states “the pen has a nib”)

% of teachers keeping 75%+ children on task



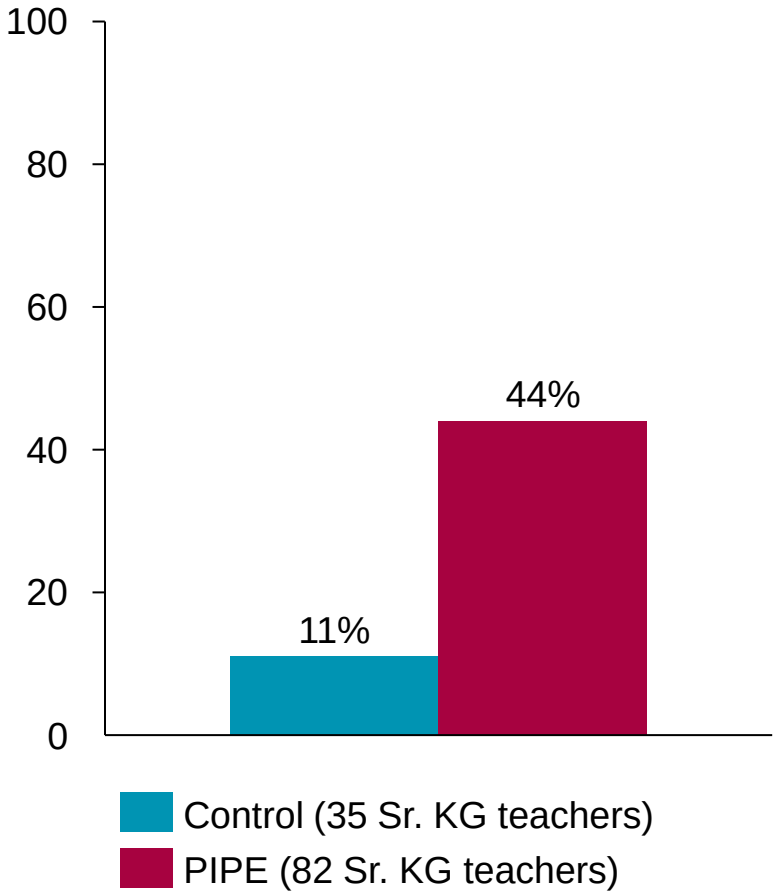
Explanation

At least 75% of the children are on task and paying attention for most of the time (e.g., activities, doing worksheets)

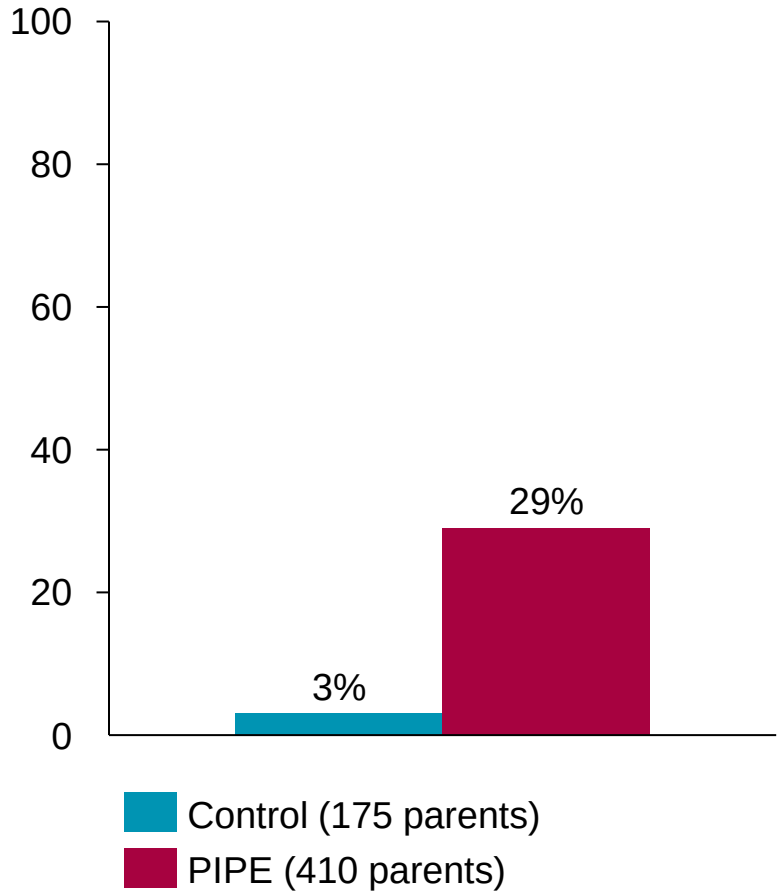
Note: Data based on assessments conducted in 2020. ‘3+ years implementation’ includes PIPE APSs implementing an ABL intervention for 3 or more years.
Sample sizes: First year implementation (34 classrooms), Second year implementation (23 classrooms and 3+ years of implementation (25 classrooms)

9 More Sr. KG parents in PIPE APSs recollected the name of the curriculum and raised complaints about it than in control APSs

% of parents that complained about the curriculum (as told by Sr. KG teachers)



% of parents that could name the curriculum provider



Note: In each APS, 5 parents were interviewed

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Overview of FSG Inclusive Markets (IM)

Mission	**To improve opportunities, agency, and choice for families with low-income** by working with companies to serve families as customers (and not with non-profits to serve them as beneficiaries)
Vision	**To demonstrate profitability of offering inclusive products, services, or practices** (e.g., housing, education, employment) that benefit families with low-income
Approach	• **Run multiyear programs to address barriers** that prevent companies from offering inclusive products, services or practices • **Talk to thousands of families to understand their needs**, aspirations, and challenges • **Talk to hundreds of CXOs and managers to understand their business**, ecosystem, regulatory and operational challenges • **Co-create, pilot and rollout solutions with companies** to address barriers and profitably scale inclusive products, services, or practices • **Publish and disseminate public goods** (e.g., primary research, best practices, business model) to get more companies to offer the product, service or practice • **Address ecosystem barriers** (e.g., policy suggestions) to make the market more conducive

Overview of PIPE

Replacing rote[1] with activity based learning[2] in affordable private schools[3] could improve learning outcomes for ~50% of children

~50% of children in India are enrolled in affordable private schools

- 40% of children in rural India are in private schools[4]
- 86% of families with low-incomes in urban India send their children to affordable private schools (APSs)[5]
- 54% of children in South Asia are enrolled in private schools for pre-primary education[6]

Current learning outcomes are poor due to rote teaching

- 35% of Grade 10 students can read at Grade 4 level[7]
- 84% of Grade 1 students can't read at grade level[8]
- Most private preschools follow mainly rote teaching with no age appropriate activities[9]

Adopting activity based learning in early years can provide the right educational foundation

- Poor learning outcomes in the early years leads to poor learning and life outcomes later[10]
- Children learn best using activity based learning (ABL) in the early years (ages 3-8)[11]
- Intervening in the early years gives the highest return on investments[12]

1. See example of rote teaching here
2. Learning through structured play-based activities, games, and experiences
3. Schools that typically charge fees under INR 1,500 (USD 23) per month, and offer classes from nursery to grade 10 or 12
4. ASER 'Early Years' Report (2019)
5. PIPE research based on 4400 interviews with families with low-incomes (2015)
6. UNICEF 'A world ready to learn' (2019)
7. Education Initiatives research based on an assessment of 50,000 students in Gujarat, Maharashtra and Rajasthan (2013-14)
8. ASER 'Early Years' Report (2019)
9. CECED, ASER, and UNICEF 'The India Early Childhood Education Impact Study (2017); PIPE research
10. S Lockhart, Play: An Important Tool for Cognitive Development (2010)
11. M. Hohmann, D.P. Weikart, 'Educating Young Children: Active Learning Practices for Preschool and Child Care Programs' (1999)
12. J Heckman and D. Masterov, The Productivity Argument for Investing in Young Children (2004)

Barriers to adoption of ABL are lack of demand and low willingness to serve APS market

APS administrators, teachers and parents are not demanding ABL

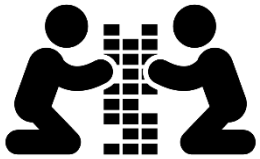
- Limited awareness of poor learning outcomes in children
- Limited awareness on the benefits of ABL
- Current rote memorization technique meets parents' demands

Solution providers[1] don't see a business opportunity to sell in the APS market

- Unclear business model to acquire and sell to APSs
- Fragmented market
- Unclear proposition for APS customers
- Lack of quality standards/ robust tools to assess quality

1. Solution providers are existing private companies currently providing ABL solutions including curriculum materials, teacher training and ongoing support to schools serving students from families with mid or high incomes

PIPE's vision is to replace rote with ABL in all 300,000 APSs in India



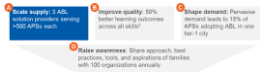
Mission	ABL solution providers **sell profitably and at scale** to APSs in India	ABL solution providers **make learning effective and enjoyable** for children	ABL solution providers **communicate the benefits of ABL** to stakeholders[1]
Goal by 2025	A **Scale supply:** 3 ABL solution providers serving >500 APSs each	B **Improve quality**: 50% better learning outcomes across all skills[2]	C **Shape demand:** Pervasive demand leads to 15% of APSs adopting ABL in one tier-1 city

D **Raise awareness**: Share approach, best practices, tools, and aspirations of families with 100 organizations annually

Detailed next

1. Stakeholders are APS administrators, teachers and parents
2. Skills include numeracy, early language skills, executive function, motor skills and socio-emotional skills

A Scale supply: PIPE partners are providing ABL to >150,000 children across 750+ APSs



Goal

3 ABL solution providers >500 APSs each

Activities

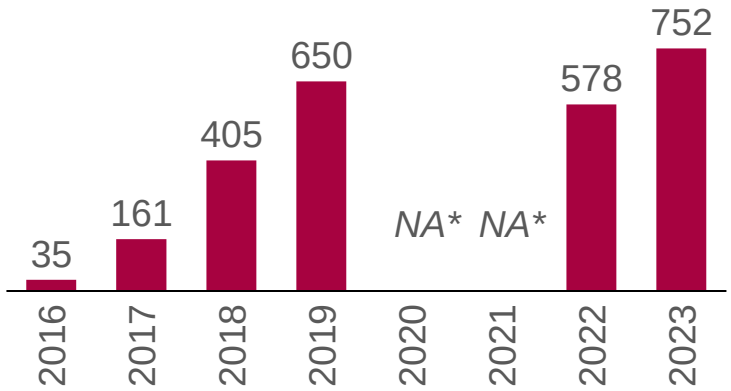
- Identified, convinced and **signed-up 8 partners** to the serve the APS market
- Developed a **profitable business model** for the APS market
- **Identified barriers and developed 23 best practices across 4 business functions** (i.e. product, sales, implementation and management) to support partners to profitably scale in the APS market
- Supported PIPE **partners to co-develop an effective organization structure and team to scale** (e.g., building a strong 2nd line of management)
- Supported PIPE partners to **embed managing by objectives** through a set of annual and monthly dashboards and metrics which determine business health

Impact to date

9 partners signed up

chrysalis, kreedo, HIPPOCAMPUS Learning Centres, 321, Next Education Transforming Education, The Karadi Path Education Company, Chipper Sage, Gyan Shala, vikalp instrument of ideas

# of APSs using PIPE partner solutions[1]



**as schools were closed due to COVID-19[2]*

1 –Based on data collected from partners I 2-Schools were physically shut due to COVID-19, and only remote learning products were offered by the partners to APSs during academic years 2020-21 and 2021-22 The PIPE team has been unable to verify children's extent of engagement with these remote learning products due to school closures and COVID travel restrictions

B Improve quality: Children in PIPE APSs responding correctly to numeracy and literacy questions increased by 33%

Goal

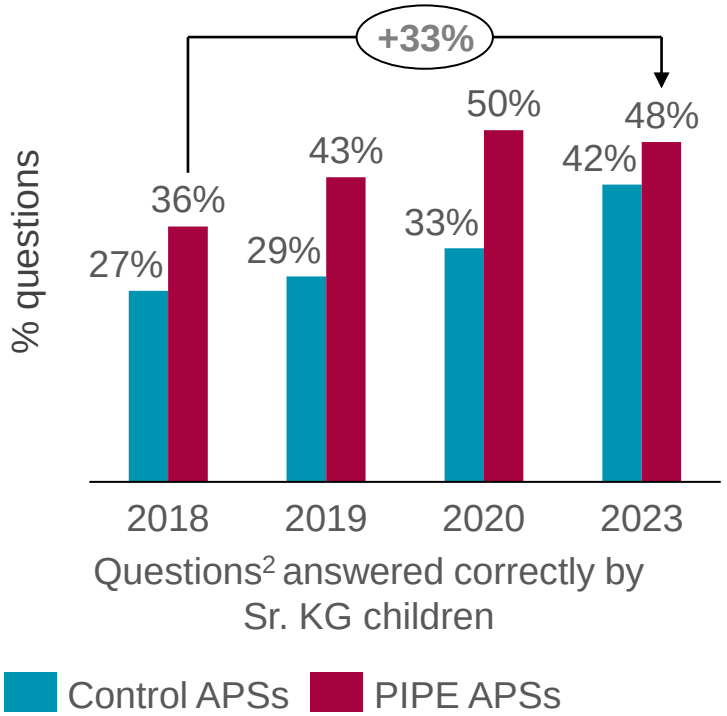
50% better learning outcomes across each skill

Activities

- **Developed public goods** based on research with 4400 parents, 28 APS administrators, 40 teachers, 167 ABL solution providers to:
  - Understand the **reasons for poor learning outcomes**
  - Leverage motivations of stakeholders to improve quality
- **Supported partners in adapting their product** for the APSs market and in improving teacher training
- Developed **'STARS', a tool to assess education quality** (including learning outcomes) in APS
- **Annually assessed and published learning outcomes** in PIPE APSs
- Supporting partners to **develop remote learning strategies to ensure learning continues** during the pandemic

Impact to date[1]

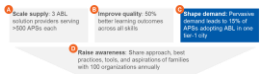
33% improvement Since 2018



PIPE could not conduct assessments in AY 2020-21 and AY 2021-22 as schools were shut due to COVID-19

1-Using the STARS tool. Sample sizes: 2018 (190 children in 38 PIPE APSs and 100 children in 20 control APSs), 2019 (636 children in 106 PIPE APSs and 168 children in 28 control APSs) , 2020 (492 children in 116 PIPE APSs and 210 children in 35 control APSs), 2023 (378 children in 63 PIPE APSs and 204 children in 34 control APSs) I 2- Represent 4 questions that were assessed from 2018-2023 – a. Can you read the word 'PIN'? b. Can you identify the largest number from a group of numbers? c. Can you count and give 12 sticks out of 20? d. Can you name any 6 animals?.

C Shape demand: Created and disseminated collateral to educate parents on the benefits of ABL



Goal

Pervasive demand leads to 15% of APSs adopting ABL in one tier-1 city

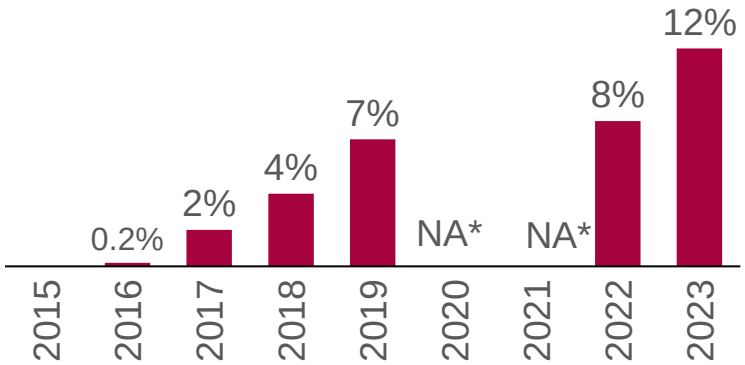
Activities

- Developed '**markers to test concepts**' to shape parental demand
- Developed **video and print collaterals** to educate stakeholders on key skills that children should be learning by age
- **Developed 8 videos to educate parents** about their child's current poor learning outcomes, and help them engage in simple activities with their children at home
- Supported partners in organizing '**learning exhibitions**' for parents, to showcase child learning outcomes due to ABL
- Developed '**Toys in a box**', an engaging set of 6-8 developmentally appropriate affordable toys that engage children on key developmental outcomes

Impact to date

Disseminated parent engagement videos to 100K+ parents

% of APSs in Bangalore adopting ABL[1]



**as schools were closed due to COVID-19[2]*

1 – Per PIPE's estimates, Bangalore has ~3,000 APSs Calculated based on the data reported by partners in July every year | 2 – Schools were physically shut due to COVID-19, and only remote learning products were offered by the partners to APSs during academic years 2020-21 and 2021-22

D Raise awareness: Shared the importance of early education and the APS market with ~180 organizations

Goal

Share approach, best practices, tools, and aspirations of families with 100 organizations annually

Activities

- **21 publications** including ANYAS, IDELA Equity
- **~50 presentations** at national and global conferences (e.g., Global Philanthropy Forum)
- **Whitepapers** highlighting program research (e.g. the PreschoolPromise)
- **9 best practices sharing sessions attended by ~20 organizations** (e.g. MSDF investee's)
- **10+ Videos** highlighting sales process, parent engagement etc.
- **~180 annual 1-1 update calls with people** from foundations, NGOs and other organizations working in the education space to share PIPE's approach

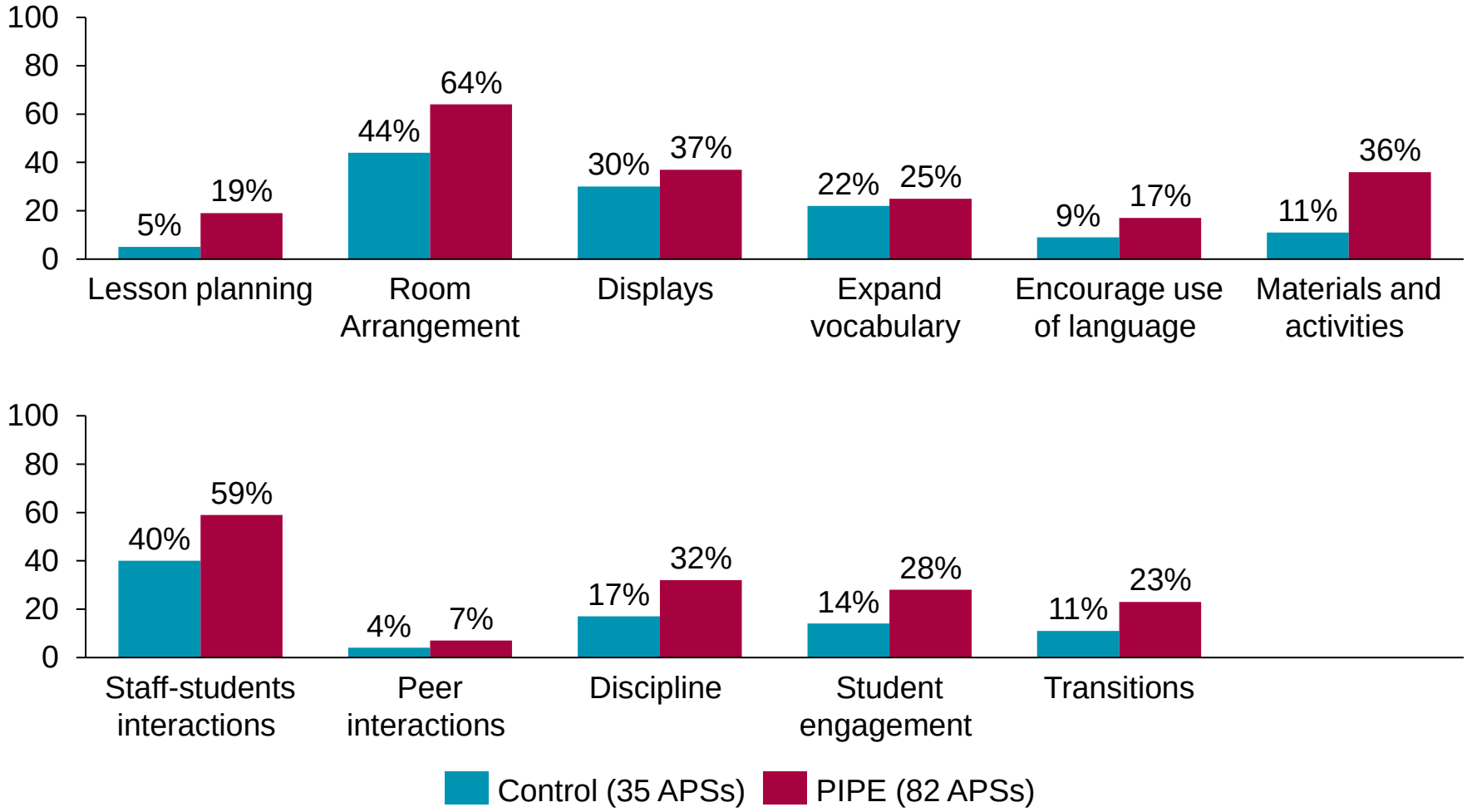
Impact to date

- **Companies have used PIPEs best practices and business model** to better target the APS market
- **Godrej** developed a program to support ABL solution providers by providing grants to APSs to "trial" the solution
- **AVPN** set up 'Early Learning Collective' as they realized that ECE can have high impact
- **Central Square Foundation** added a vertical that focuses on ECE based on PIPE research
- **Aga Khan Education Service, India** using videos developed by PIPE to communicate benefits of ABL to teachers and parents

Table of contents

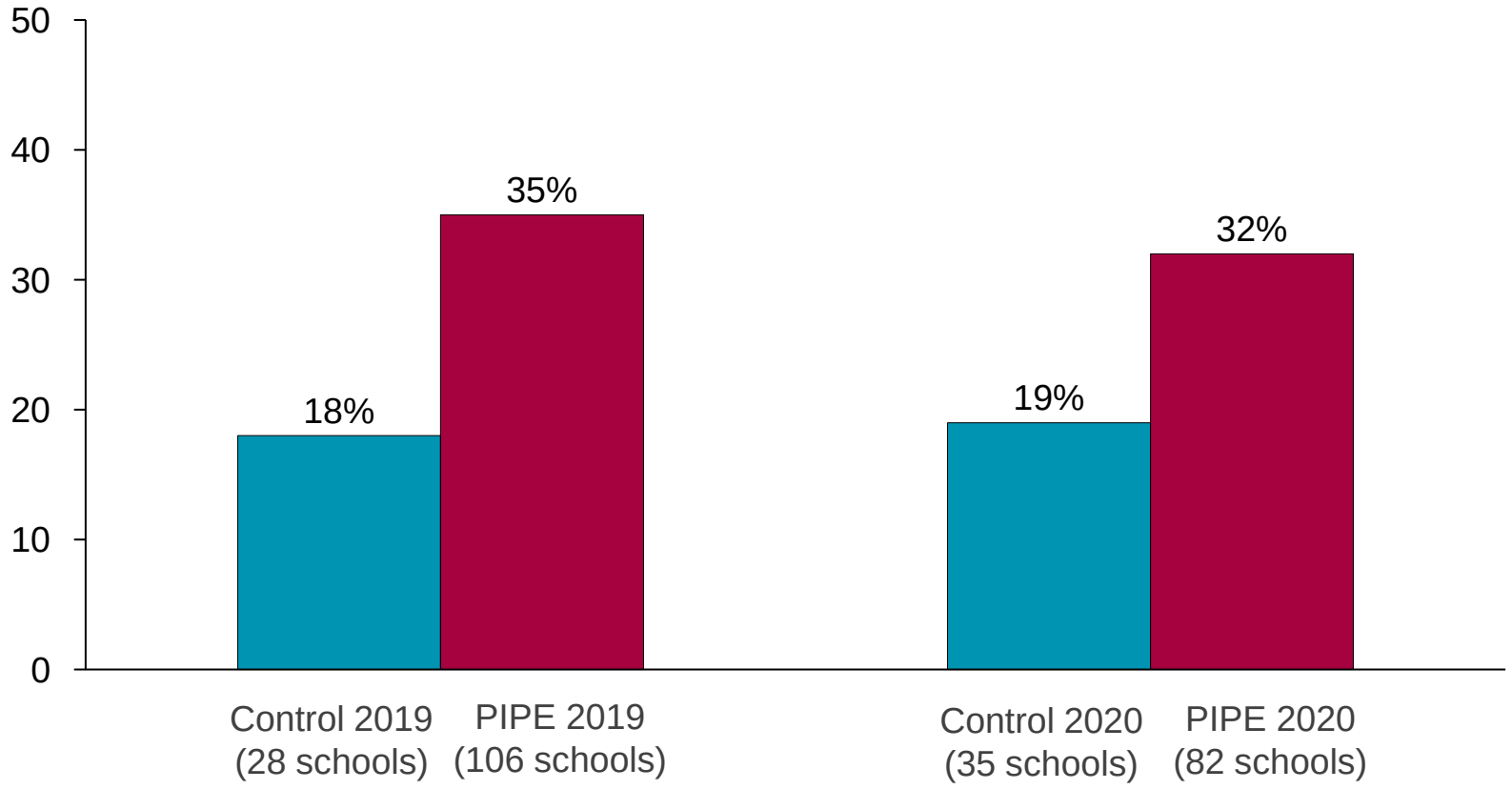
Classroom environment | PIPE APSs have done better on all dimensions as compared to control APSs

Average score of all dimensions of classroom environment (out of 3)



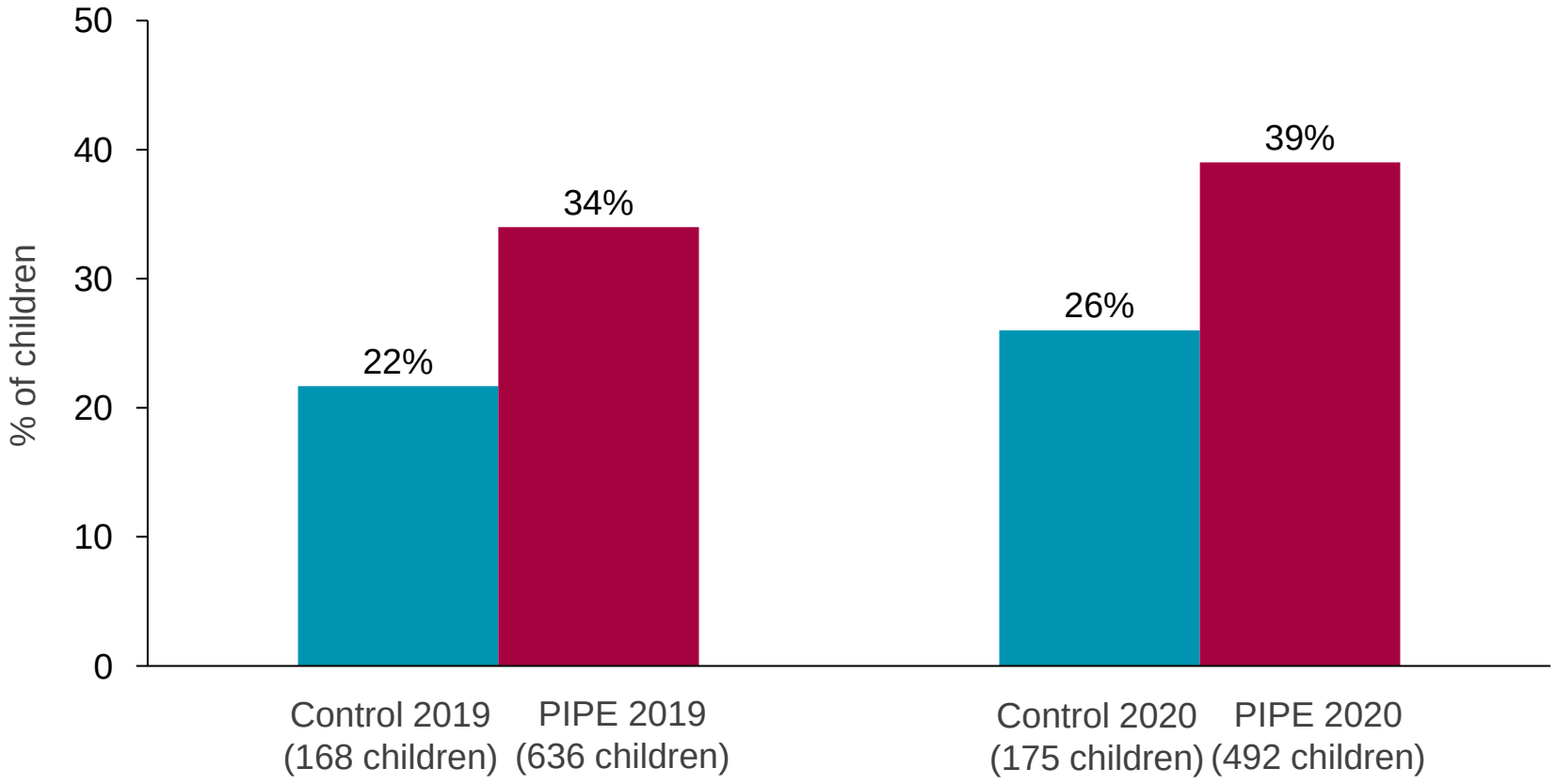
Classroom environment | There is no significant difference in classroom environment score over the past two assessments

Comparison of classroom environment score of PIPE and control APSs in 2019 and 2020



Sr. KG learning outcome 2019-2020 | Children across PIPE and control APSs have improved over the past two assessments

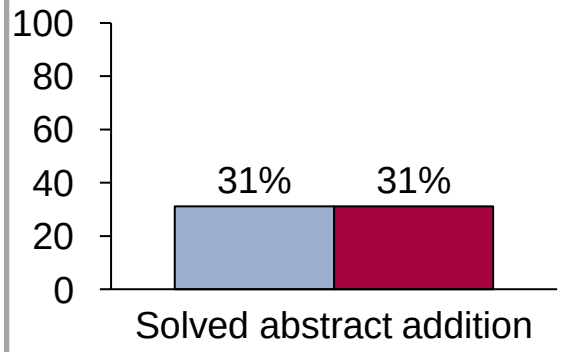
Comparison of Sr. KG student outcomes score of PIPE and control APSs in 2019 and 2020

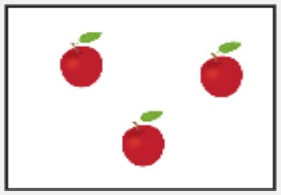


1. In each APS, 6 Sr.KG children were assessed on 7 questions, each – 3 in math and 1 each on reading, executive function, spoken English and expressive vocabulary

Sr. KG learning outcome | Children in PIPE APSs have improved across literacy, numeracy and cognitive tasks over years

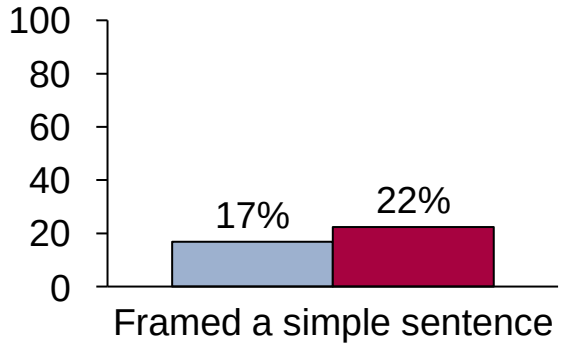
% of Sr. KG children[1] that solved abstract addition problem



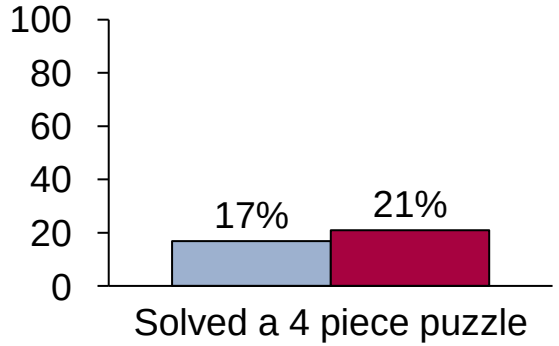


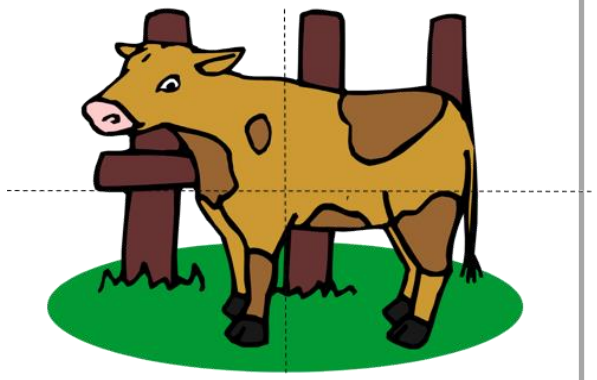
Question-
"There are 3 apples in this box. If I were to add 2 more, how many would be there in total?"

% of Sr. KG children[1] that framed an English sentence (noun, verb) when shown a picture[2]



% of Sr. KG children[1] that solved a 4 piece puzzle





PIPE 2019 (636 children) PIPE 2020 (492 children)

1. Represent questions that were assessed in 2019 and 2020. 2. Child is expected to frame a simple sentence consisting of one noun and one verb (e.g., girl playing, boy cycling)

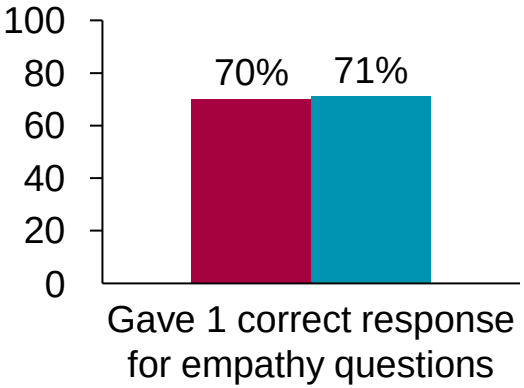
Sr. KG learning outcome | Children in PIPE and control APSs had similar results on empathy and conflict resolution

Empathy (Question)[1]

a "This girl is crying. What would you do to make her feel better?"

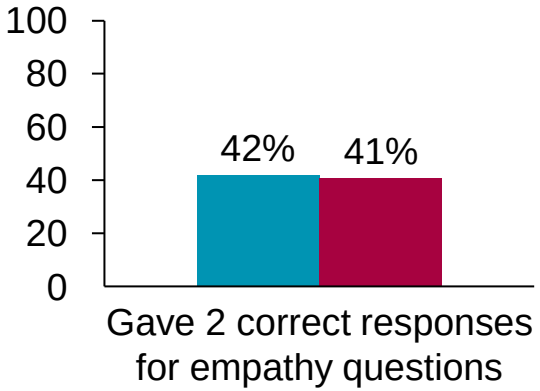
b Is there anything else you would do?

a % of children that gave a correct response



Gave 1 correct response for empathy questions

b % of children that gave a correct response



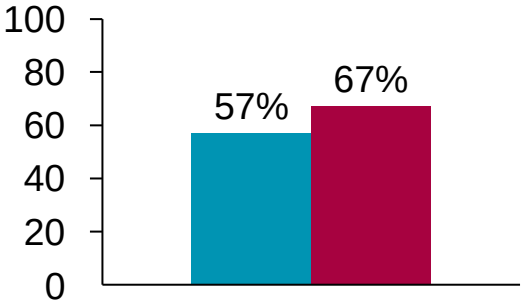
Gave 2 correct responses for empathy questions

Conflict resolution (Question)[2]

c "Imagine that you are playing with a toy that you like. Now another child wants to play with that same toy, but there is only one toy. What would you do in this situation?"

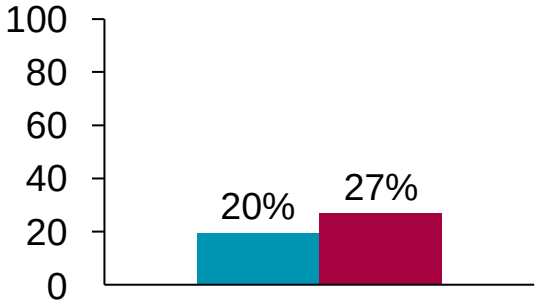
d Is there anything else you would do?

c % of children that gave a correct response



Gave 1 correct response for conflict resolution questions

d % of children that gave a correct response

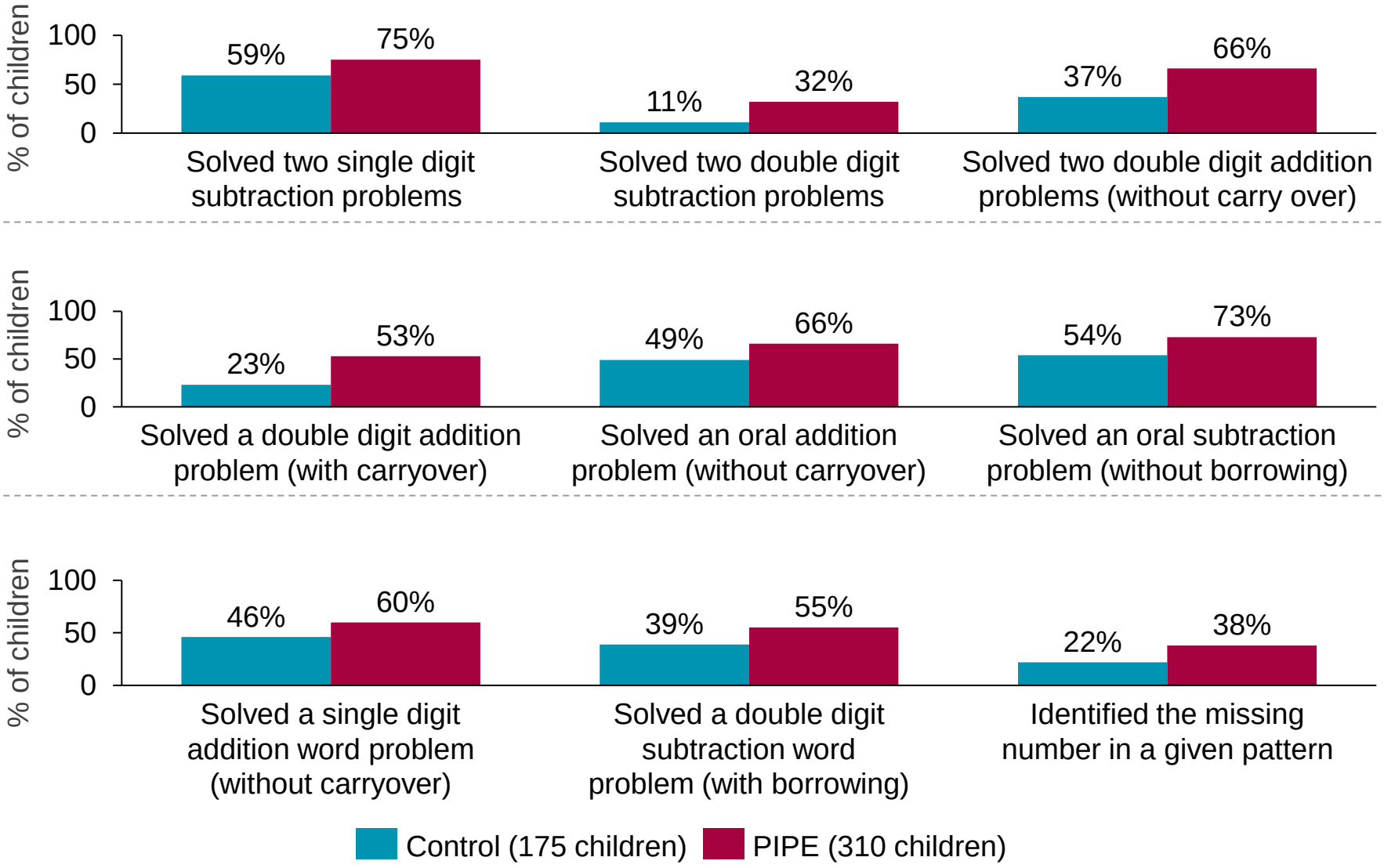


Gave 2 correct responses for conflict resolution questions

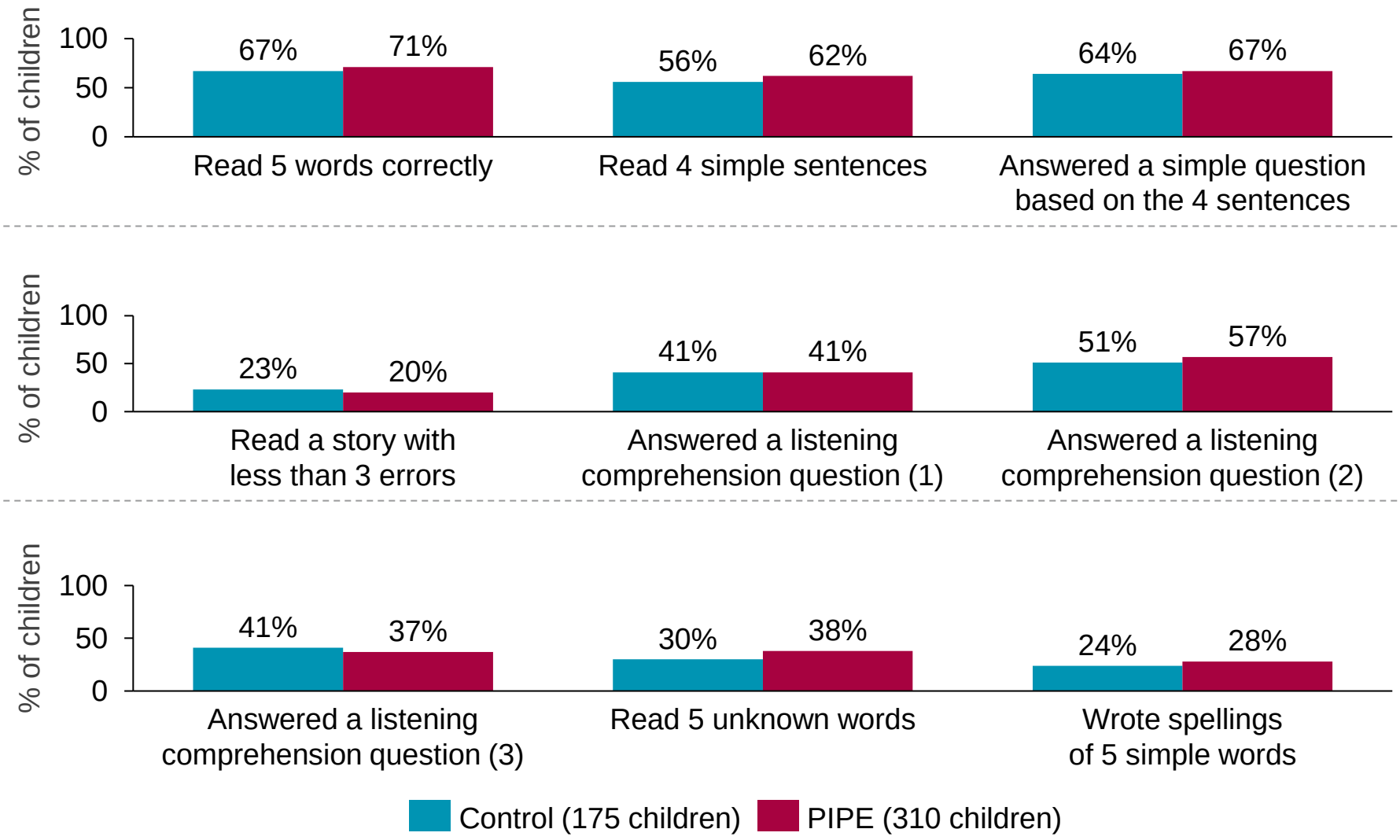
Control (210 children) PIPE (492 children)

1. Example response- 'I will give her a chocolate', 'I will call her mother' 2. Example response- 'I will share the toy', 'I will give my toy to him/her'

Grade 2 learning outcome - Math | Children in PIPE APSs are doing significantly better as compared to children in control APSs

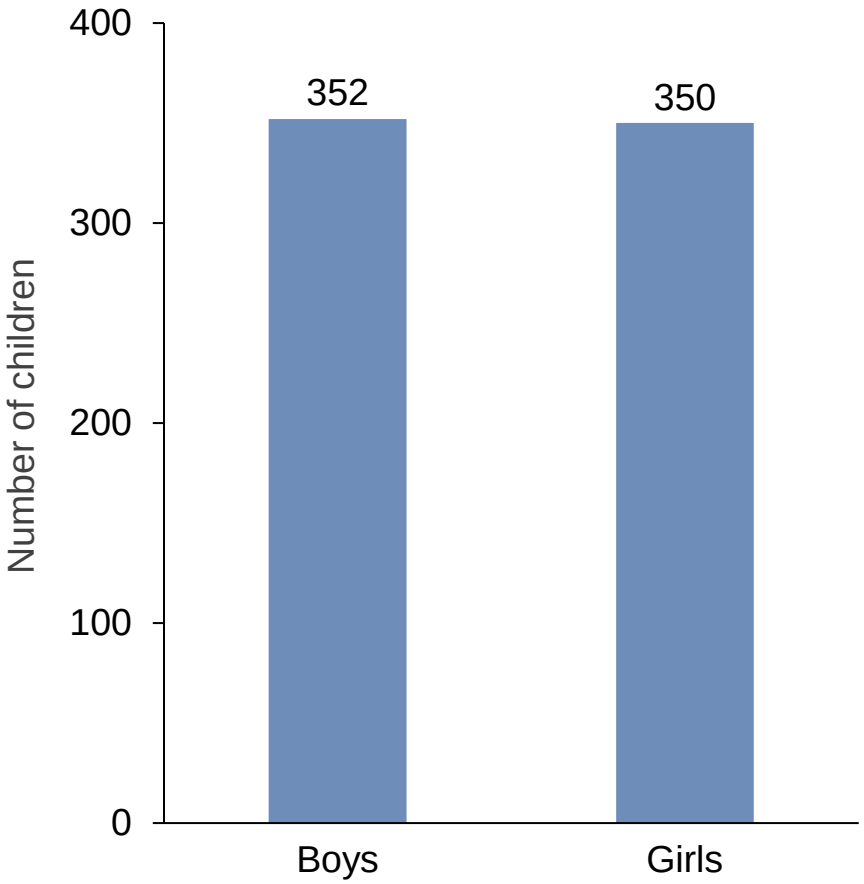


Grade 2 learning outcome - English | Children in PIPE APSs are at par with children in control APSs

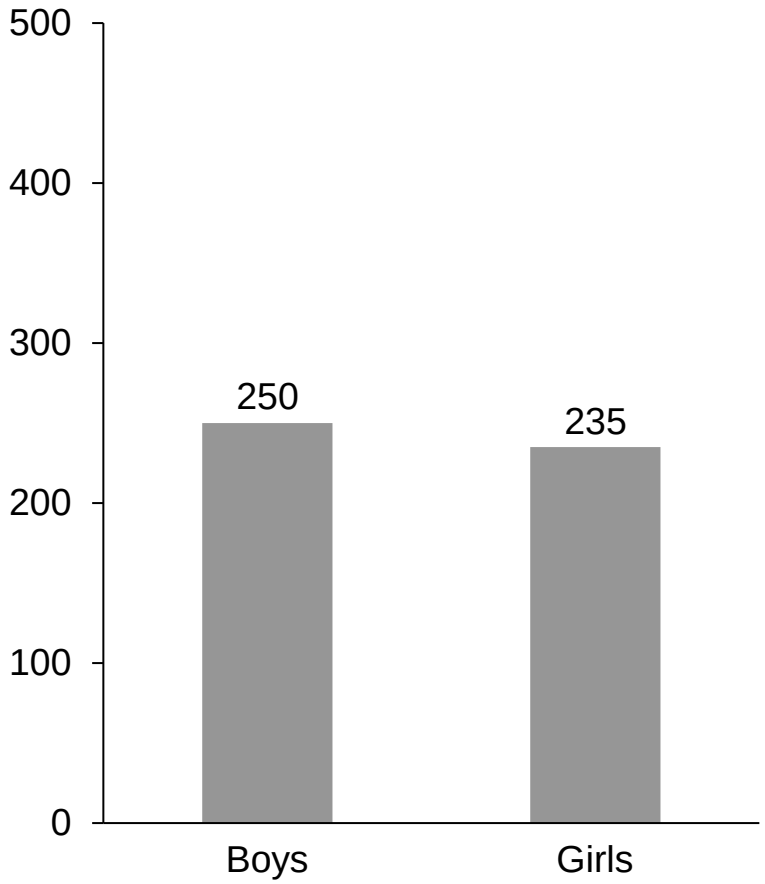


Sample size of children assessed in Sr. KG and Grade 2 | Similar number of boys and girls were assessed

Total number of Sr. KG boys and girls assessed [1]



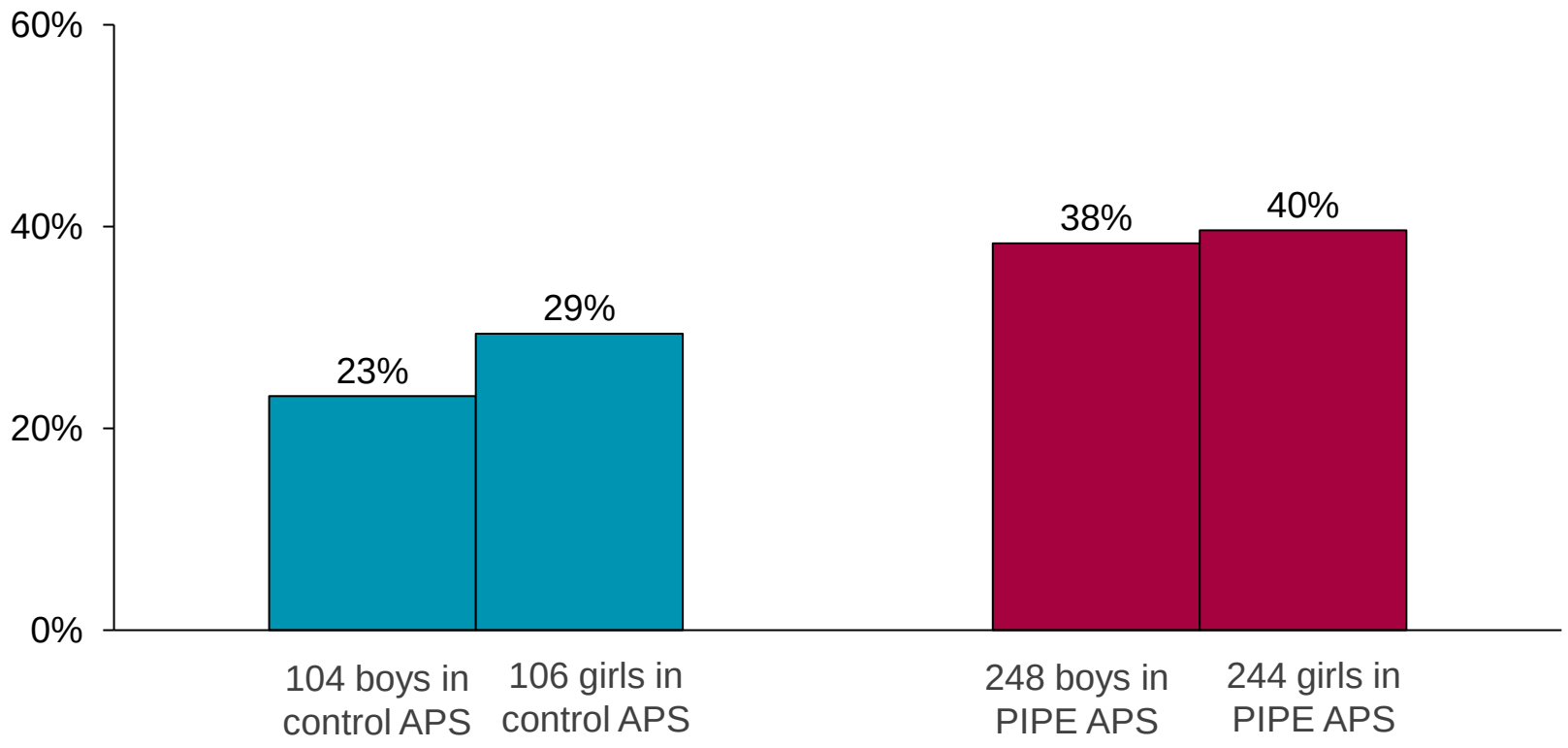
Total number of grade 2 boys and girls assessed [2]



1. Sr. KG sample size includes 104 boys and 106 girls from control schools and 248 boys and 244 girls from PIPE schools
2. Grade 2 sample size includes 90 boys and 85 girls from control schools and 160 boys and 150 girls from PIPE schools

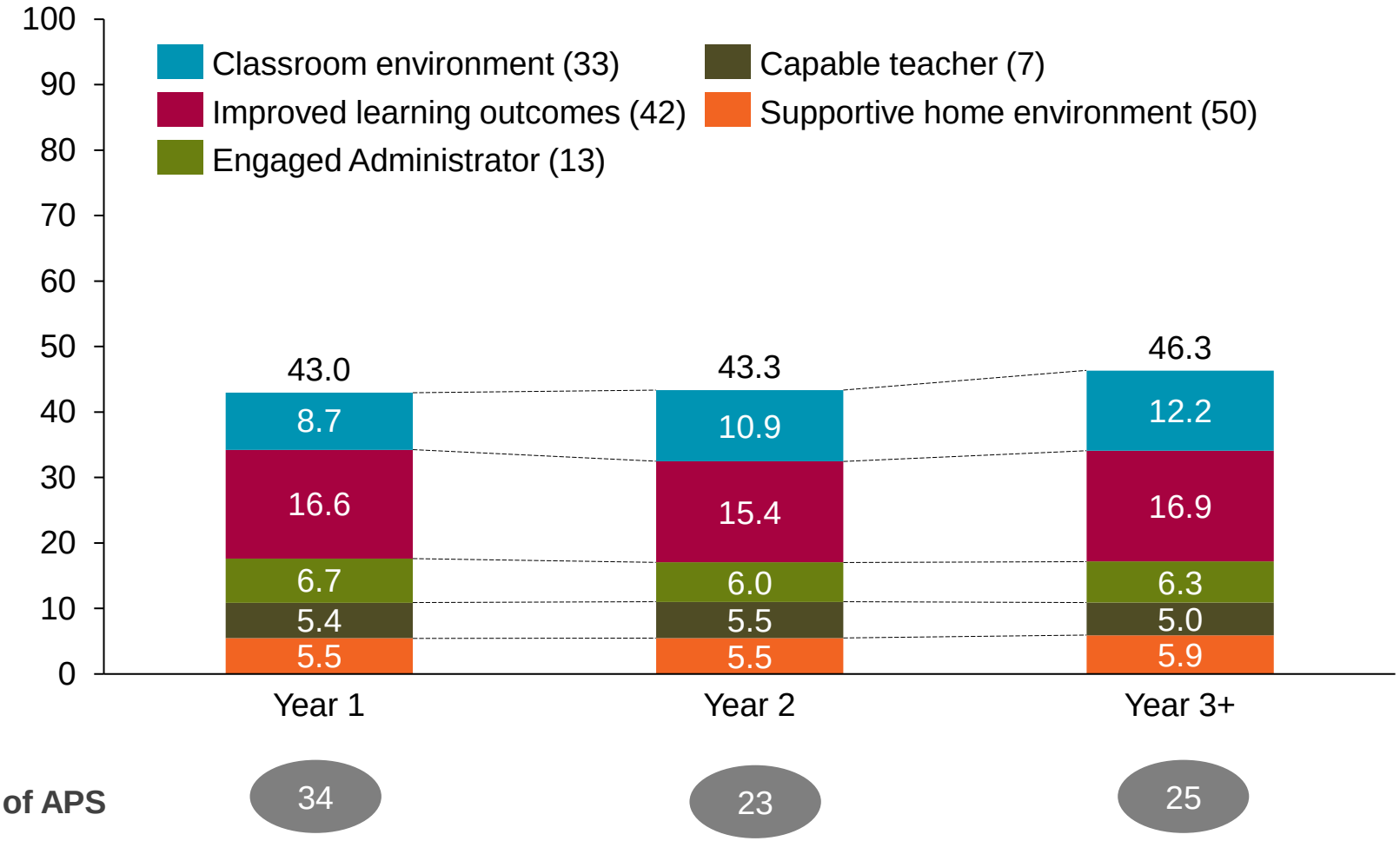
Sr. KG learning outcome scores by gender | No significant variance was observed across PIPE and Control schools

% of Sr. KG children that answered questions correctly (by gender)



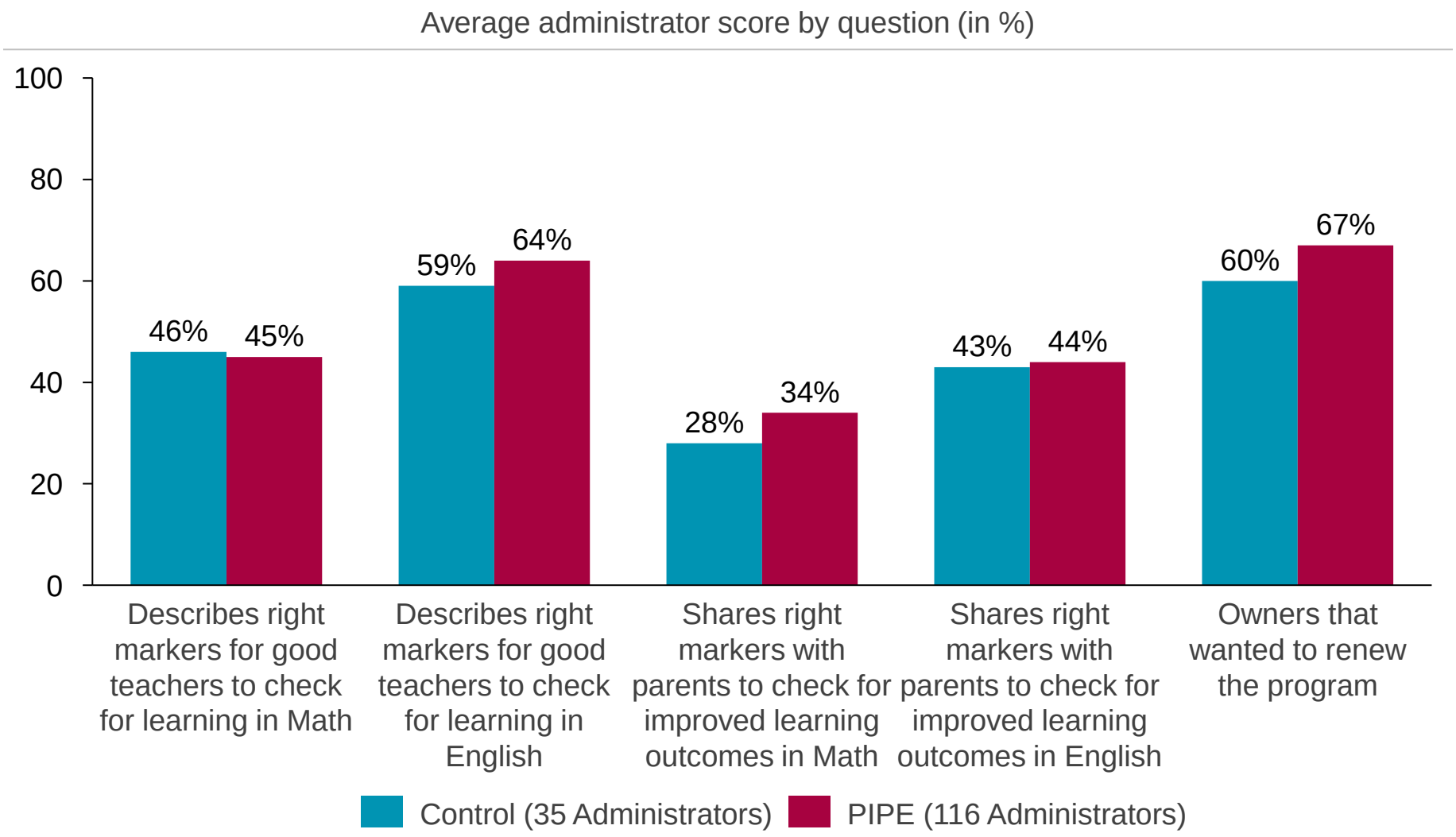
Assessment scores by year of implementation | Significant improvements observed in the quality of classroom environment

Average score by year of implementation (Out of 145)



1. Total section score captured in brackets ()

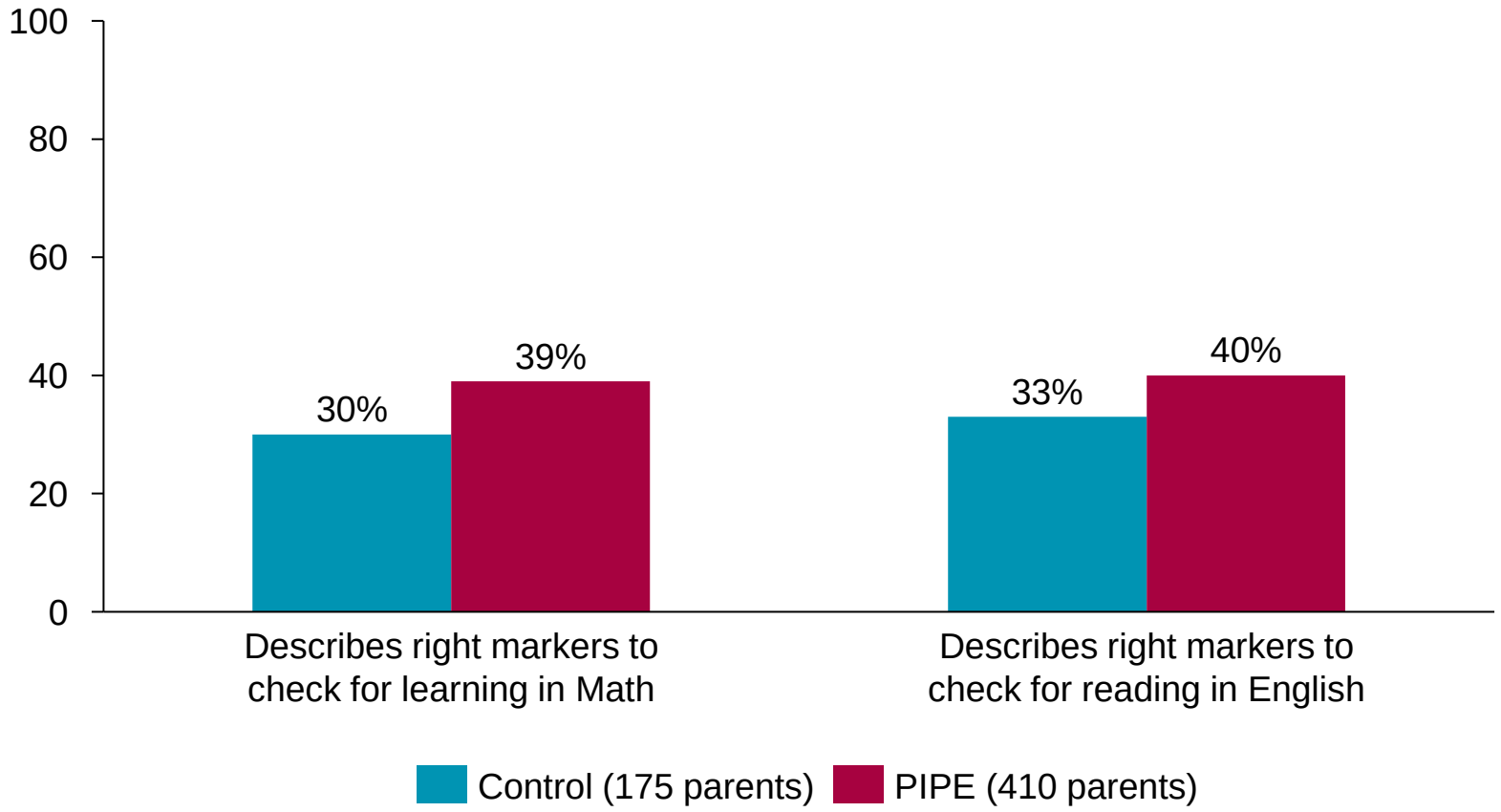
Administrator interview | No significant variance between PIPE and control APS administrators observed



Note: Represents owners of all PIPE APSs where Sr. KG and grade 2 assessments were conducted

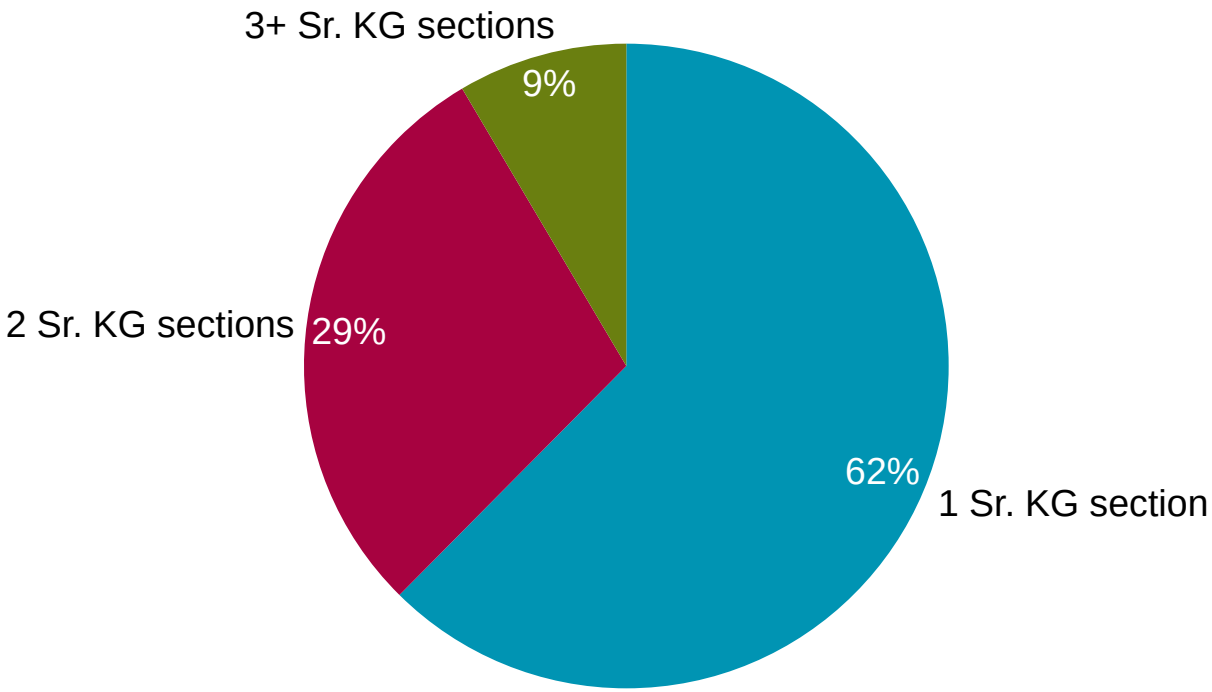
Parent interview | More Sr. KG parents in PIPE APSs described one marker to check for learning in Math and English

Average parent score by question (in %)



Average number of sections | There are an average of 1.41 sections in each APS

Spread of APSs by number of Sr. KG section(s)

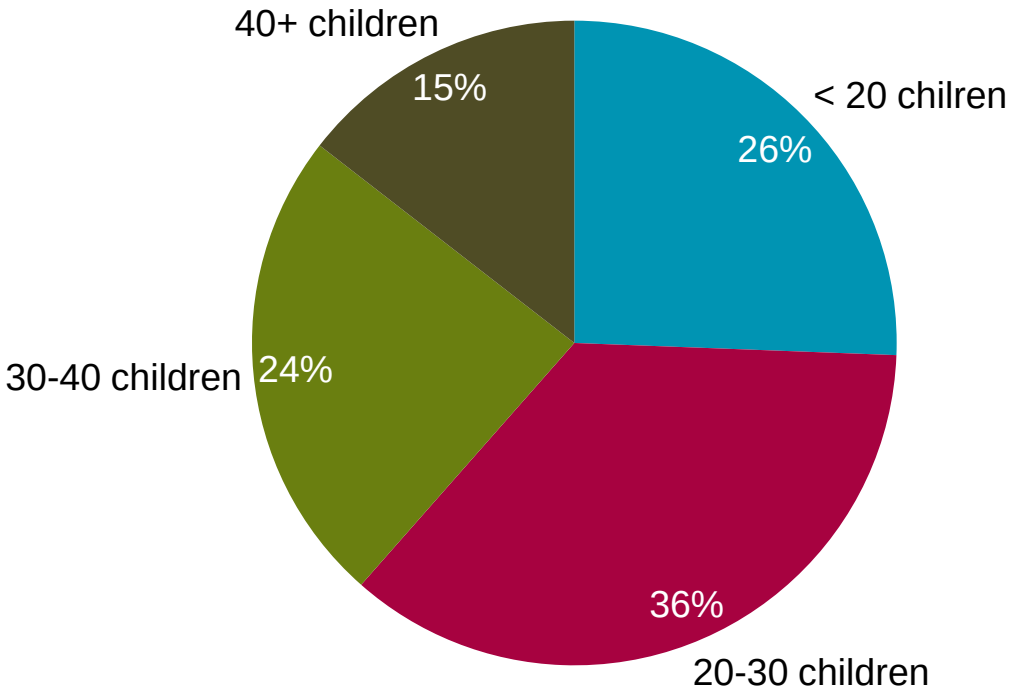


Sample size 117

Sample size includes 35 control and 82 PIPE APSs

Average number of children in each Sr. KG classroom

Average number of children[1] per Sr. KG classroom

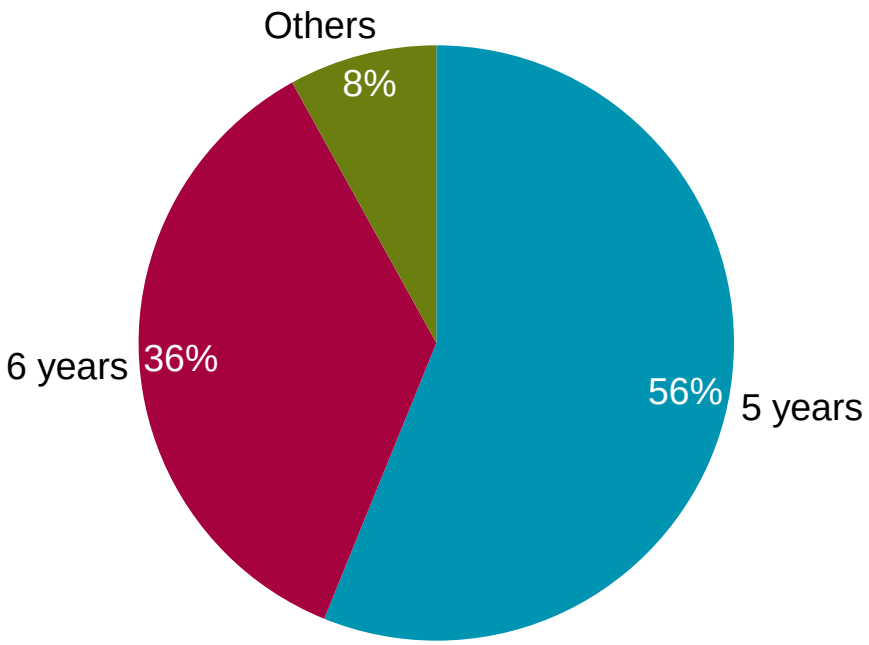


Average # of children	28
Sample size	117

1. Number of children per classroom were documented based on attendance register and manual counting on the day of observation

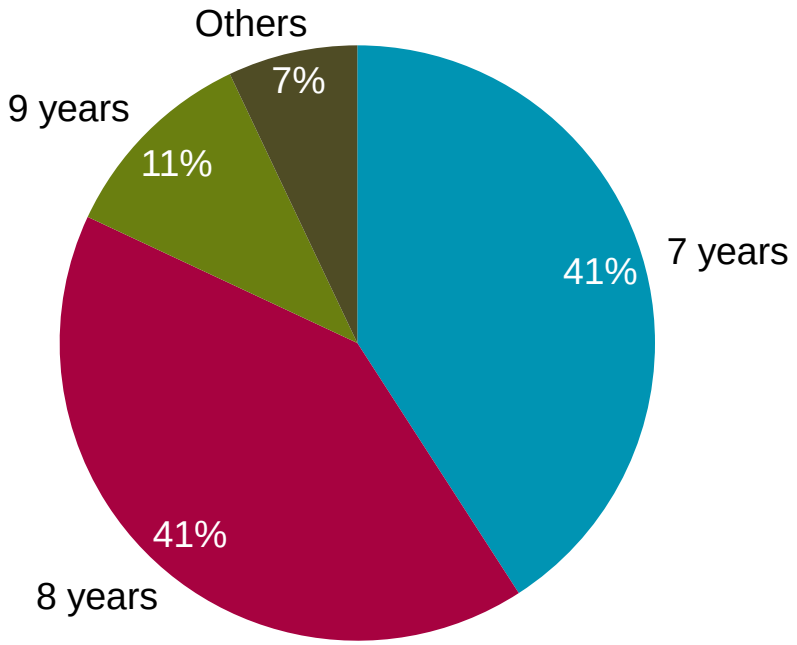
Age | Average age of children in Sr. KG is 5.32 years and of grade 2 children is 7.66 years

% of Sr. KG children by age



Average age	5.38
Sample size	702

% of Grade 2 children by age

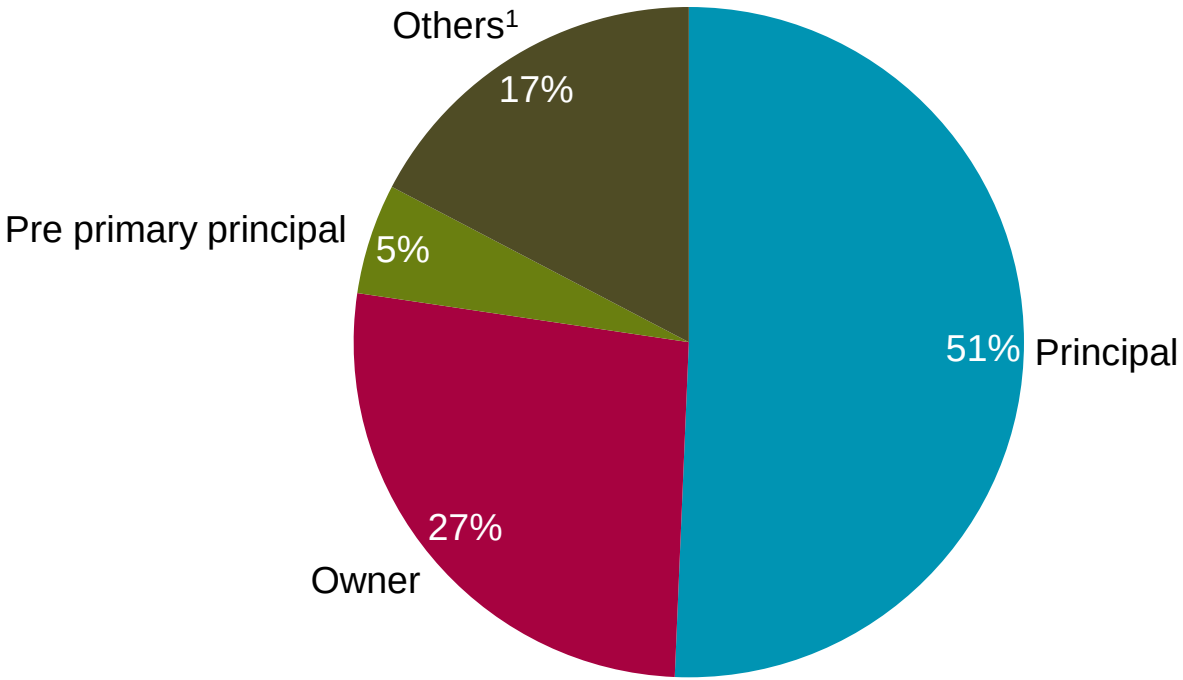


	7.66
	485

Note: Age as provided by children

Type of administrators interviewed | Owners and principals were predominantly interviewed

Spread by role of administrator

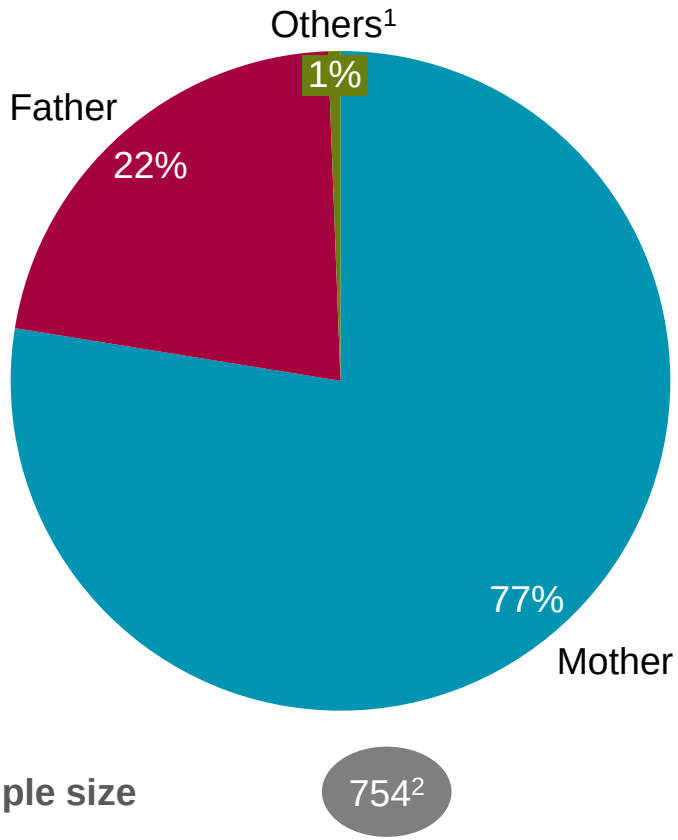


Sample size 151

1. Others refers to vice principal, school coordinators, in-charge, trustee, management, secretary, etc.

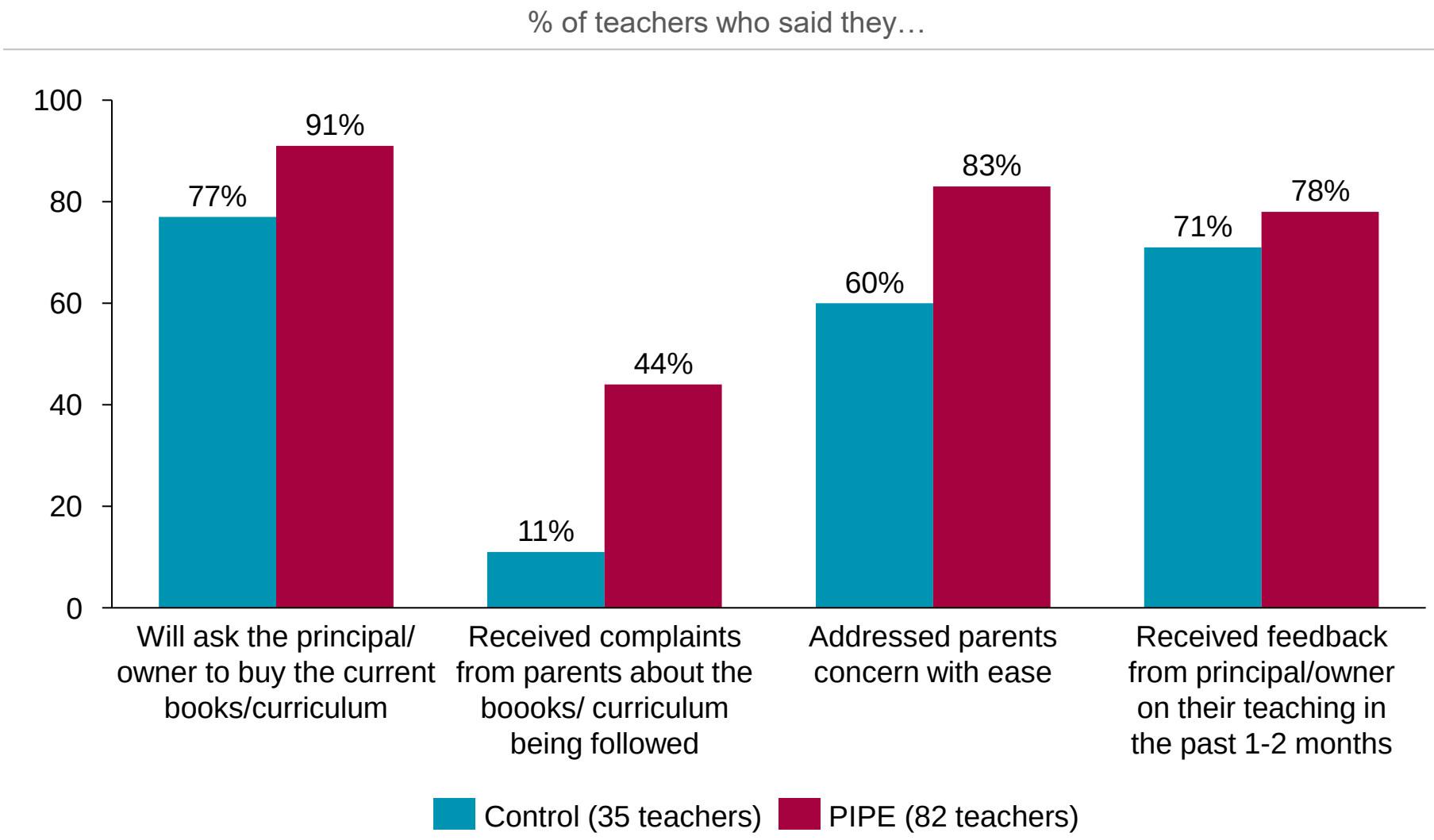
Distribution of parents interviewed | Mothers were predominantly interviewed, followed by fathers

Distribution of parents interviewed (by relationship)



1. Others include grandparents, uncle, aunt or sisters 2. In each school, 5 parents were interviewed. In one control school only 4 parents were interviewed

Teacher interview | PIPE teachers recommend the respective curriculum despite receiving more complaints from parents



Details on classroom environment dimensions observed (1/2)

Topic	0	1	2	3
Lesson planning	No plan available ***(or)*** Time table available	Plan available without detailed steps and/or materials required (e.g. "phonics for A-E", "counting 11-15")	Plan available with -Steps to follow -Materials required ***(and)*** Teacher follows plan	Teacher articulates learning objectives ***(or)*** Teacher checks for learning outcomes in at least one way
Room arrangement	Most of the classroom area is so crowded that learning activities cannot be conducted ***(and)*** There are no alternate spaces available to conduct activities	The class/ alternate space is crowded but at least one area has been organized where at least one learning activity can be conducted (e.g. benches moved slightly to make room in the front)	The class/ alternate space is organized such that two or more learning activities can be conducted ***(and)*** The teacher can supervise most children	Children are observed using the space for more than one activity
Displays	There are no relevant displays (e.g. alphabets, numbers, weather charts, shapes, posters about transport, my body) on the classroom walls	Relevant materials are displayed on the classroom wall	Relevant materials are displayed on the classroom wall and referred to at least twice (by teacher or children)	Children's artwork displayed on the wall
Expand vocabulary	Teacher may use new words but does not introduce them with an explanation	Teacher introduces 1-2 new words with minimal explanation (e.g. for the word "nib"; the teacher states "the pen has a nib")	Teacher introduces 1-2 new words and correctly explains their meanings (e.g. for the word "nib", the teacher (i) shows a pen, (ii) points to the nib; (iii) provides explanation about the object)	Teacher exposes children to language by (any of the below): • Using adjectives or descriptions • Using multiple scenarios or examples to explain something • Telling stories/ anecdotes
Encourage use of language	Majority of questions are rote based (i.e. have specific one or two word responses) or yes/ no answers ***(and)*** Talking among children or with staff is not encouraged	Staff asks at least two open-ended questions during the observation (e.g. questions that begin with how, what if, why, tell me about)	Staff responds positively to children's communication and encourages them to talk more	Staff child conversations go beyond classroom activities and materials (e.g. social talk about home and family life, activities in the community, feelings, other non-school topics)
Staff-child interaction	Staff* is unresponsive or interacts negatively with children **Staff refers to all adults observed in classroom*	Whole class interactions between staff and children are positive	Staff interacts positively with some children individually by providing positive feedback/ reinforcement	Staff gives a message of warmth through actions (any of the below): • appropriate physical contact • respectful tone • showing sensitivity to children's needs

Details on classroom environment dimensions observed (2/2)

Topic	0	1	2	3
Materials and activities	No appropriate materials (e.g. flashcards) are used by teacher/ children ***(Or)*** Teacher uses materials/ conducts activities incorrectly (e.g. adopts rote approach when using flashcards)	At least one material is appropriately used by teachers to teach a concept	One material is appropriately used by children (individually, in pairs or small/large groups) to learn a concept ***(and)*** Staff asks children questions to test understanding or stimulate reasoning about that material/ activity/ concept	More than one material is appropriately used by children (individually, in pairs or small/large groups) to learn a concept ***(and)*** Staff asks children questions to test understanding or stimulate reasoning about more than one material/ activity/ concept
Peer interaction	There is no planned peer interaction* for children **Peer interaction refers to children engaging with each other in pairs and small/large groups*	Peer interaction is observed for less than 5 minutes	Peer interaction is observed for a total of at least 10 minutes	Peer interaction is observed for a total of at least 20 minutes ***(and)*** Staff guides children on positive interaction (e.g. sets tone like share materials, encourages use of social cues like say please, thank you)[#]
Discipline	Class is poorly managed with no norms, routines or expectations made visible or used ***(or)*** Severe forms of discipline are used (e.g. yelling, threatening)	Teachers use appropriate rules to manage class (e.g. Raise hands to ask or answer questions) ***(and)*** Staff does not hurt or intimidate children ***(and)*** One use of a norm/ routine is observed (e.g. Calling out “1-2-3” “Eyes on me”)	Children appear to be aware of class rules and expectations (e.g. children clean up after activity is done) ***(and)*** Expectations are reinforced gently and positively ***(and)*** 2 different norms/ routines are observed	Staff tries to involve children in solving their conflicts and problems
Student engagement	Half the children are disengaged for most of the time ***(or)*** Children are only participating in rote or whole group recitation/ repetition	At least 75% of the children are on task and paying attention for most of the time	Children participate in small group (3-6 children) activities ***(and)*** Teacher observes when children are disengaged and attempts to bring them back on task	Some children ask questions in class
Transitions	Transitions* are chaotic or abrupt (e.g. staff not prepared, materials not ready, children required to wait) **Transition: A period of time when children are moving from one activity/ lesson to the next*	Transitions involve a wind-down or closure of the previous activity ***(and)*** an introduction to the next activity ***(and)*** Teacher takes more than 3 minutes to organize	Transitions involve a wind-down or closure of the previous activity ***(and)*** an introduction to the next activity ***(and)*** Teacher takes less than 3 minutes to organize	Teachers actively engage children during transitions

Sr. KG assessment questions (1/2)

Sl no.	Construct	Questions	Expectation
1	**English reading**	"Can you read 'pin'?" *[Show word 'pin']*	Child should be able to read new and unfamiliar 3 letter phonic words correctly
2	**English speaking**	"Can you tell me in English what is happening in this picture?" *[Show a picture of park with 2-3 children playing different games]*	Child should be able to say at least one sentence using English words about a familiar topic/ theme
3	**One-to-one correspondence**	"Can you give me 12 sticks?" *[Ask while pointing to a bowl with 20 ice cream sticks]*	Child should be able to count up to 12 sticks correctly
4	**Comparing numbers**	"Can you identify the greatest number here?" *[Show numbers 6, 3, 5, 9, 4, and 7 arranged randomly]*	Child should be able to identify the greatest single digit number from a random group of numbers

Sr. KG assessment questions (2/2)

Sl no.	Construct	Questions	Expectation
5	**Abstract addition**	"There are 3 apples in this box. If I were to add 2 more, how many would be there in total?" *[Point towards a photo of 3 apples. Do not indicate the numbers with fingers or otherwise]*	Child should be able to do abstract addition with single digit numbers
6	**Executive function**	"Can you complete this puzzle?" *[Give the child a four-piece puzzle]*	Child should be able to complete up to 4-piece puzzles
7	**Oral vocabulary**	"Name as many animals as you can."	Child should be able to recall and name at least 6 animals

Grade 2 assessment questions- English (1/2)

Ask the child to read this tool. Mark the child at the highest level he/she can reach.[1]

Q1. Ask child to read out all the words given in the box.

both	cup	step
out	dog	rope
hat		key

Q2. Ask the child to read the paragraph given in the box. If child reads para correctly, then move Q3

There is a big monkey.
He lives on a tree.
He likes to jump.
He also likes bananas.

Q3. If child reads para in Q2 correctly, ask the child: **What does the monkey like?**

Q4. Ask the child to read the story in the given box. Child must read this story fluently and without mistakes.

A big tree stood in a garden. It was alone and lonely. One day a bird came and sat on it. The bird held a seed in its beak. It dropped the seed near the tree. A small plant grew there. Soon there were many more trees. The big tree was happy.

Q8. Ask child to read the following words

leb	gax	ral
nom	diz	tob
fut		hig

Questions No.	1	2	3	4	8
Expectation	Children must read 5 or more words correctly	Children must make 3 or less errors	Child says either jumping or banana	Children must read full story fluently with three or less errors	Children must read 5 or more words

1: All questions have been sourced from ASER Centre Test Samples and EGRA; Question 3 added by PIPE to test comprehension

Grade 2 assessment questions- English (2/2)

Sl no.	Construct	Questions[1]	Expectation
5,6,7	**Listening comprehension[2]**	"Now I will read you a small story. Then I will ask you some questions. Listen carefully. Rani is feeling very sad. She dropped her new toy and it broke. Her mother comes home and sees the broken toy. She picks up the pieces and helps Rani fix the toy with glue. The toy looks fine now and Rani is happy once again." Ask the child: - Why is Rani sad? - Who helps Rani? - Why is Rani happy now?	Child should give correct answers to the question based on the read-aloud passage
9	**Oral dictation**	Ask child to write legibly jot mud ship tram goat best spray fight	Children must write 5 or more spellings correctly to get a tick

1: Questions have been sourced from ASER Centre Test Samples and EGRA; 2: Question 5,6,7: Added by PIPE

Grade 2 assessment questions- Math (1/3)

Ask the child to read this tool. Mark the child at the highest level he/she can reach.[1]

	Q1. Ask the child to do both 2 problems from any one set below. Both problems must be correct for a tick.		Q2. Ask the child to do both 2 problems from any one set below. Both problems must be correct for a tick.		Q3. Ask the child to do both 2 problems from any one set below. Both problems must be correct for a tick.	
SET A	9 – 5	7 – 2	51 – 35	67 – 48	13 + 35	37 + 40
SET B	4 – 3	7 – 6	84 – 49	73 – 36	44 + 21	43 + 36
SET C	5 – 2	4 – 1	56 – 37	31 – 13	41 + 37	13 + 12
SET D	3 – 1	8 – 4	45 – 18	43 – 24	45 + 12	43 + 24
SET E	5 – 3	4 – 2	25 – 19	56 – 39	13 + 12	56 + 31

1: Questions have based on ASER Centre Test Samples and EGMA

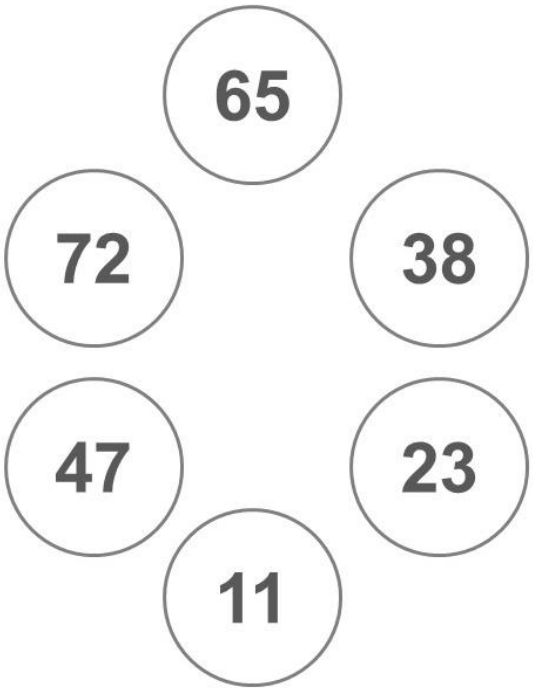
Grade 2 assessment questions- Math (2/3)

Ask the child to read this tool. Mark the child at the highest level he/she can reach.[1]

Q4. Ask the child to do both 2 problems from any one set below. Both problems must be correct for a tick.

SET A	18 + 35 = ____	37 + 44 = ____
SET B	24 + 29 = ____	43 + 39 = ____
SET C	28 + 37 = ____	49 + 12 = ____
SET D	18 + 27 = ____	43 + 19 = ____
SET E	13 + 19 = ____	59 + 31 = ____

Q9. Ask to child to identify the biggest number below



Q10. DO THIS QUESTION ORALLY

[Say to the child]
"Can you say the missing number below:"

10 15 ____ 25

[If correct, start with patterns below. If incorrect, give the correct answer and start with patterns below]
"Can you say the missing number below:"

300 400 500 ____

28 ____ 24 22

1: Questions have based on ASER Centre Test Samples and EGMA

Grade 2 assessment questions- Math (3/3)

Sl no.	Construct	Questions[1]	Expectation
5	**Word problem (Simple)**	How much is 9 and 4 altogether?	Child must say 13
6	**Word problem (Simple)**	If I take away 5 from 9, what is left?	Child must say 4
7	**Word problem (Complex)**	Samara had 4 chocolates. Her father gave her 7 more chocolates. How many chocolates does Samara have altogether?	Child must say 11
8	**Word problem (Complex)**	Raju had 12 chocolates. He gave 5 chocolates to Pooja. How many chocolates does he have left?	Child must say 7

1: Questions have based on ASER Centre Test Samples and EGMA

Administrator interview questions (1/5)

<table>
<tr><th>Question</th><th>0</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td rowspan="2">Question 1:
How does a good teacher know if a child is learning Math?

(Prompt “Can you suggest more ways to check” once)</td><td rowspan="2">Mentions one or more of the following:
Ask the child to:
• Recite 1-100
• Write numbers
• Write number names
• Recite tables
Check test scores/report card
Unaware
Other</td><td>Mentions one of the following:</td><td>Mentions two of the following OR one in column 3:</td><td rowspan="2">Mentions two or more of the following:
Ask child to:
• Fill missing numbers
• Identify 'before-after' numbers
• Compare quantities/ numbers (e.g. bigger/ smaller, less/ more than, largest/ smallest)</td></tr>
<tr><td colspan="2">Ask child to:
• Identify numbers at random
• Identify shapes
• Count using objects (e.g. beads, fruits, vegetables)
• Add or subtract</td></tr>
</table>

Administrator interview questions (2/5)

Question	0	1	2	3
Question 2: How does a good teacher know if a child is learning English? ***(Prompt "Can you suggest more ways to check" once)***	***Mentions one or more of the following:*** Ask child to: • Recite A-Z • Recite rhymes • Repeat after teacher • Write alphabets • Check test scores/report card • Read familiar words taught in class (cat, bat, apple) • Unsure/ unaware	***Mentions one of the following:*** Ask child to: • Identify letters at random • Match sounds with letters • Write dictated alphabets/ words/ spellings • Respond to simple questions (e.g. "What is your name?") • Use every day phrases like "good morning," "please," "thank you" • Follow instructions in English	***Mentions one of the following:*** Ask child to: • Describe a picture in English/ Narrate a story/ event • Read new words (e.g. in newspaper, story book, billboard) • Match the word to the picture • Name objects starting with a letter • Speak in English (Have simple conversations in English) • Phonics • Blending of sounds	***Mentions two or more of the following:***

Administrator interview questions (3/5)

Question	0	1	2	3
Question 3: What do you tell parents about how they can help their child learn Math at home? ***(Prompt "any more" once)*** ***(Prompt "Give examples of homework" if the response is "Ensure homework is completed")***	***Mentions one or more of the following*** Ask child to: • Recite numbers • Copy numbers • Check report cards • Send to tuitions • Ensure homework is completed • Revise lesson taught at school • Do nothing • Other	***Mentions one of the following*** Ask child to: • Count objects • Identify shapes, etc. • Add or subtract	***Mentions two or more of the following OR one in column 3***	***Mentions two or more of the following*** Ask child to: • Arrange currency in order of value • Word problems for addition/ subtraction • Play simple games (e.g. snakes and ladders) • Teach kids to sort (e.g. shapes, size, colour) • Transact using real money • Read numbers at random (e.g. mobile and bus numbers)

Administrator interview questions (4/5)

<table>
<tr><th>Question</th><th>0</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td rowspan="2">Question 4:
What do you tell parents about how they can help their child learn English at home?

(Prompt “any more” once)

(Prompt “Give examples of homework” if the response is “Ensure homework is completed”)</td><td rowspan="2">Mentions one or more of the following
Ask child to:
Recite poems
Recite A-Z
Send to tuitions
Check exam results
Attend PTM
Ensure homework is completed
Do nothing
Other</td><td>Mentions one or more of the following</td><td>Mentions one or more of the following OR one in column 3</td><td rowspan="2">Mentions two or more of the following
Ask child to:
Read “new” words
Describe their routine/ picture/ event/ TV show etc.
Identify sounds/ phonics
Tell/ Read stories together in English
Show English stories/ cartoons on YouTube, TV (or similar media)
Speak with parent in English (Make simple conversation)
Follow simple instructions (e.g. “Go carefully”)</td></tr>
<tr><td colspan="2">Ask child to:
Read words taught in school
Identify letters at random
Identify colours / animals / vehicles, etc.
Practice writing alphabets
Name objects starting with a letter
Encourage conversations in English</td></tr>
</table>

Administrator interview questions (5/5)

Question	0	1
[Transition question] Which book publisher or programme is used in your Sr. KG classroom?	Enter name of programme below _____	
Question 5: Are you going to renew that book publisher / programme for the upcoming year?	• No / Unsure	• Yes

Parent interview questions (1/2)

Questions	0	1	2	3
	Mentions one or more of the following:	***Mentions one of the following:***	***Mentions two of the following:***	***Mentions three of the following:***
1. At the end of Sr KG/ this grade what should your child know in Math?	• Write number names • Write numbers • Recite rhymes on numbers • Recite numbers • Recite tables • Check homework • Unsure / other	• Count items (fruits/vegetables) • Identify numbers at random • Identify currency value • Transact with money • Add/ subtract/ divide • Identify shapes • Play games involving cards/ dice • Identify missing number before/ after • Identify greater than / less than numbers		
2. At the end of Sr KG/ this grade what should your child know in English?	• Recite nursery rhymes • Ability to complete homework • Practice cursive writing • Recite A-Z • Unsure / other	• Identify letters at random • Read words/ alphabets in school/ tuition book • Read new words • Match sounds and letters • Identify sounds/ phonics • Have simple conversations in English • Follow simple instructions given in English • Read simple stories • Match words and picture of the word		

Parent interview questions (2/2)

Questions	0	1
3. Which company's textbooks are used in your child's school?	• Doesn't know or no response	• Names the correct publisher
4. Are you satisfied with this company's books?	• No	• Yes
5. Are you satisfied with this school?	• No	• Yes
6. Would you recommend the school to any other parent?	• No	• Yes

Teacher interview questions

[Warm up] How are you?

[Warm up] What classes do you teach?

[Warm up] We are interested in talking about Sr. KG.

[Warm up] Which books or curriculum do you use in your classroom?

- Question 1: How satisfied are you with the current books/ curriculum?
- Question 2: Have parents shared any complaints about the curriculum / books being followed?
- Question 3: Has it been easy for you to address their complaints?
- Question 4: Have you spent money to buy teaching learning material this Academic Year? How much?
- Question 5: In the past 1-2 months, has the principal / owner given you feedback on your teaching?
- Question 6: If you join a new school, will you ask the principal / owner to buy the current books/ curriculum?
- Question 7: How many days of teacher training have you attended this Academic Year from someone from within the school?
- Question 8: How many days of teacher training have you attended this Academic Year from someone outside the school?
- Question 9: How many total days of teacher training have you attended this Academic Year?

REIMAGINING SOCIAL CHANGE