Azim Premji University

# Loss of Learning during the Pandemic

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These papers present findings from Azim Premji Foundation's field engagements in trying to improve the quality and equity of school education in India. Our aim is to disseminate our studies to practitioners, academics and policy makers who wish to understand some of the key issues facing school education as observed by educators in the field. The findings of the paper are those of the Research Group and may not reflect the view of the Azim Premji Foundation including Azim Premji University.

# Loss of Learning during the Pandemic

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# Executive Summary

School closure due to the COVID-19 pandemic has led to complete disconnect from education for the vast majority of children or inadequate alternatives like community-based classes or poor alternatives in the form of online education, including mobile phone-based learning.

One complete academic year has elapsed in this manner, with almost no or little curricular learning in the current class. But this is only one kind of loss of learning. Equally alarming is the widespread phenomenon of 'forgetting' by students of learning from the previous class – this is regression in their curricular learning. This includes losing foundational abilities such as reading with understanding and performing addition and multiplication, which they had learnt earlier and become proficient in, and which are the basis of further learning. These foundational abilities are such that their absence will impact not only learning of more complex abilities but also conceptual understanding across subjects.

Thus, this overall loss of learning – loss (regression or forgetting) of what children had learnt in the previous class as well as what they did not get an opportunity to learn in the present class – is going to lead to a cumulative loss over the years, impacting not only the academic performance of children in their school years but also their adult lives. To ensure that this does not happen, multiple strategies must be adopted with rigorous implementation to compensate for this overall loss of learning when schools reopen.

This study, undertaken in January 2021, reveals the extent and nature of the 'forgetting/regression' kind of learning loss (i.e. what was learnt earlier but has now been lost) among children in public schools across primary classes because of school closure during the COVID-19 pandemic. The study covered 16067 children in 1137 public schools in 44 districts across 5 states. It focused on the assessment of four specific abilities each in language and mathematics, across classes 2-6. These four specific abilities for each grade were chosen because these are among the abilities for all subsequent learning – across subjects – and so the loss of any one of these would have very serious consequences on all further learning.

An assessment of the learning levels of children when schools closed as well of their current status were necessary to understand any such regression. The former was best done through teachers who have been deeply engaged with their learners, and thus had a reliable assessment of children's abilities, when schools closed in March 2020. Therefore, this baseline assessment of children's learning levels, i.e. where they were assessed on specific abilities in language and mathematics when schools closed, was done based on a comprehensive analysis by the relevant teachers, aided by appropriate assessment tools. All abilities associated with the previous class were not assessed; a few abilities critical for further learning were carefully identified and assessed. These are referred to as specific abilities in the document. 'End-line' was the assessment of the same children's proficiency on these very same abilities in January 2021, which was done by administering oral and written tests.

# Key Findings

**Learning loss in language**

- 92% of children on an average have lost at least one specific language ability from the previous year across all classes.[1]
- Illustratively, these specific abilities include describing a picture or their experiences orally; reading familiar words; reading with comprehension; writing simple sentences based on a picture.
- 92% of children in class 2, 89% in class 3, 90% in class 4, 95% in class 5, and 93% in class 6 have lost at least one specific ability from the previous year.

**Learning loss in mathematics**

- 82% of children on an average have lost at least one specific mathematical ability from the previous year across all classes.[2]
- Illustratively, these specific abilities include identifying single- and two-digit numbers; performing arithmetic operations; using basic arithmetic operations for solving problems; describing 2D/3D shapes; reading and drawing inferences from data.
- 67% of children in class 2, 76% in class 3, 85% in class 4, 89% in class 5, and 89% in class 6 have lost at least one specific ability from the previous year.

[1] This is not the simple average of values for each class but a weighted average where the average of each class is weighted by the number of children in the sample from each class.

[2] As in footnote above.

The extent and nature of learning loss is serious enough to warrant action at all levels. Policy and processes to identify and address this loss are necessary as children return to schools. Supplemental support, whether in the form of bridge courses, extended hours, community-based engagements and appropriate curricular materials, will be needed to help children gain the foundational abilities when they return to school. It follows that teacher capacity to ensure student learning in these unusual circumstances must be in focus, particularly with respect to pedagogy and assessment needed to deal with students at diverse learning levels. And most importantly the teachers must be given enough time to compensate for both kinds of learning loss – and we must not rush into promoting children to the next class.

# 1. Introduction

Studies across the world have clearly indicated that school closures have significant negative impact on learning levels of children, with children from disadvantaged backgrounds being affected more severely.[3] This loss of learning is not simply the curricular learning that children would have acquired if schools remained open. It includes the abilities that children have forgotten due to lack of usage, for example the ability to read with understanding, the ability to write, and the ability to perform basic mathematical operations like addition and multiplication. This regression further compromises new learning since these abilities are foundational to all further learning. This situation must be juxtaposed with the fact that we are already facing a crisis in learning, particularly with respect to foundational literacy and numeracy.[4]

At the time of writing this report, schools have been closed for almost an entire academic year. A child who was in class 1 in March 2020 will move into class 3 in 2021 without having engaged with the curriculum of class 2, except through sporadic online or community-based engagements. Thus, the loss of learning during the pandemic comprises the 'forgetting/regression' of a proportion of abilities children already knew, including the loss of foundational abilities that make it possible for children to take up further learning, and the absence of curricular learning for an entire academic year. Examples of foundational abilities would be the ability to read numbers up to 99 in class 2 that forms the basis of performing more complex mathematical operations in higher classes. Similarly, for children in class 2, the ability to respond to comprehension questions based on a story forms the basis for acquiring higher order abilities related to reading and writing. The absence of any one of these foundational abilities manifests not only in the inability to acquire more complex abilities, but also in a disconnect from learning, peers and schooling, often causing children to drop out of school altogether.

[3] The Center for Research on Education Outcomes. (2020). Estimates of Learning Loss in the 2019-2020 School Year. Stanford University. https://credo.stanford.edu/sites/g/files/sbiybj6481/f/short_brief_on_learning_loss_final_v.3.pdf; Kuhfeld, M., Soland, J., Tarasawa, B., Jhonson, A., Ruzek, E., & Liu, J. (2020). Projecting the potential impacts of COVID-19 school closures on academic achievement. Retrieved from Annenberg Institute at Brown University, (EdWorkingPaper: 20-226). https://doi.org/10.26300/cdrv-yw05; World Bank Group. (2020). Simulating the potential impacts of COVID-19 school closures on schooling and learning outcomes: a set of global estimates. http://pubdocs.worldbank.org/en/798061592482682799/covid-and-education-June17-r6.pdf

[4] MHRD. (2020). National Education Policy 2020. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

The impact of the period of school closure in India has implications for strategies that the public education system and other stakeholders working with this system need to adopt in the coming months. Different school processes, such as defining the academic year, curriculum, pedagogy, teacher training and assessment, would need to factor in the extent and nature of learning loss that school children have experienced over the period of school closure.

This study, therefore, was undertaken as a field-level empirical study to understand the extent and nature of learning loss among public school children across the primary classes because of school closure during the COVID-19 pandemic. The entire study was conducted in January 2021.

# 2. Methodology of the Study

The study was conducted with 16067 children in 1137 public schools and covered 44 districts across 5 states -- Chhattisgarh, Karnataka, Madhya Pradesh, Rajasthan and Uttarakhand (see Table 1). Teachers were selected based on prior knowledge of their engagement in school teaching-learning processes and were close collaborators in the field-level assessment of children's learning. The Azim Premji Foundation has been consistently working with these very committed and capable teachers over a long period. Only such deeply engaged teachers can have a reliable and consistent understanding of their children's learning levels and progress, and therefore provide an assessment of the learning status of children when schools closed. Consent of all participating teachers was obtained for the study.

Selection of children was based on discussions with teachers and efforts were made to cover children across all primary classes that the teacher had taught in the previous year, both girls and boys. These were children that the concerned teachers were intimately familiar with; hence, they had a very good sense of their learning abilities at the time of school closure in March 2020. A baseline assessment of these children on specific abilities in language and mathematics was done based on comprehensive analysis by the teachers to understand their learning abilities in the class they were in just before schools closed.

End-line assessment of current learning levels on the same specific abilities was done by administering oral and written tests to the same children. This was done by assessors in collaboration with the teachers. The assessment was generally carried out in the community or even in homes. The site was decided based on logistical convenience at the local level.

Table 1: Children and schools covered state-wise

| State | Number of Schools* | Number of Students | |
|---|---|---|---|
| | | Girls | Boys |
| Chhattisgarh | 215 | 1623 | 1313 |
| Karnataka | 326 | 2095 | 1736 |
| Madhya Pradesh | 169 | 1033 | 734 |
| Rajasthan | 198 | 2027 | 1891 |
| Uttarakhand | 229 | 1990 | 1625 |
| **Total** | **1137** | **8768** | **7299** |

* The assessments were not done for the entire school. The number of schools indicate that the children assessed in the study were enrolled across 1137 schools in total.

Assessments were done for children on only select foundational abilities for the previous class, across all the primary school classes they were in 2019-20. This is because schools closed soon after students moved to the current class they are presently in (2020-2021) and also because there has not been any significant teaching-learning support during the period of school closure. [5]

Assessment tools were designed in alignment with NCERT's Learning Outcomes for two subject areas, language and mathematics, for classes 1 to 5. Age-appropriate core content domains were identified and mapped to the NCERT Learning Outcomes for both subjects. Further, specific abilities for each of the learning outcomes that are the foundation for further learning were carefully identified. These specific abilities were selected from the abilities associated with the previous class because the absence of any one of these would deeply compromise the acquisition of more complex abilities and impact learning across subjects as the child moves through different stages in school. These abilities would need to be in focus once schools reopen.The assessment tools were piloted in four states – Karnataka, Madhya Pradesh, Rajasthan, and Uttarakhand – with a small sample of teachers and children, and then refined further based on the feedback received.

In addition to the assessment data, field-level narratives from the interactions with children, families and teachers were collated by the assessors.

[5] Azim Premji Foundation. 2020. Myths of Online Education. Bangalore: Azim Premji University

# 3. Findings

## 3.1 Learning Loss: Children who have lost at least one Specific Ability in Language and Mathematics

**Learning loss in language**

**92%** of children on an average have lost at least one specific language ability from the previous year across all classes.[6]

- Illustratively, these specific abilities include describing a picture or their experiences orally; reading familiar words; reading with comprehension; writing simple sentences based on a picture.
- 92% of children in class 2, 89% in class 3, 90% in class 4, 95% in class 5, and 93% in class 6 have lost at least one such specific ability from the previous class.

**Learning loss in mathematics**

**82%** of children on an average have lost at least one specific mathematical ability from the previous year across all classes.[7]

- Illustratively, these specific abilities include identifying single- and two-digit numbers; performing arithmetic operations; using basic arithmetic operations for solving problems; describing 2D/3D shapes; reading and drawing inferences from data.
- 67% of children in class 2, 76% in class 3, 85% in class 4, 89% in class 5, and 89% in class 6 have lost at least one such specific ability from the previous class.

## 3.2 Language Abilities: Learning Loss

Language assessments included oral expression, reading fluency, listening comprehension and writing skills for classes 2 and 3, and oral expression, reading fluency, reading comprehension and writing skills for classes 4, 5 and 6. Figure 1 summarises the analysis of learning loss for these language abilities.

[6] This is not the simple average of values for each class but a weighted average where the average of each class is weighted by the number of children in the sample from each class.

[7] As in footnote above.

Figure 1: Percentage of children who have lost specific language abilities compared to baseline

## Class 2

### Oral expression

49% of the children lost the ability to express the events happening in a picture, in their own words.

### Reading fluency

71% of the children lost the ability to identify a word in print (written or printed).

### Writing skill

30% of the children lost the ability to label names of self-created images.

### Listening comprehension

23% of the children lost the ability to orally answer questions upon listening to a story.

## Class 3

### Oral expression

45% of the children lost the ability to orally express views on simple topics like home and school.

### Reading fluency

67% of the children lost the ability to complete words given in print format.

### Writing skill

46% of the children lost the ability to express views about a given picture in written form.

### Listening comprehension

50% of the children lost the ability to orally answer questions after listening to a poem.

## Class 4

### Oral expression

61% of the children lost the ability to express the gist of a poem upon listening, in their own words.

### Reading fluency

10% of the children lost the ability to read rhyming words fluently.

### Writing skill

29% of the children lost the ability to write 4-5 simple sentences on a given picture.

### Reading comprehension

23% of the children lost the ability to answer questions upon reading a story.

Figure 1 (continued)

## Class 5

### Oral expression

61% of the children lost the ability to orally express the association between read text and personal experiences.

### Reading fluency

39% of the children lost the ability to read an unfamiliar poem with fluency.

### Writing skill

41% of the children lost the ability to write a story/poem with imagination.

### Reading comprehension

16% of the children lost the ability to answer questions based on a given text.

## Class 6

### Reading comprehension

43% of the children lost the ability to answer questions based on a text.

### Reading fluency

23% of the children lost the ability to read the contents of a newspaper.

### Writing skill

54% of the children lost the ability to write their views on various events happening around them.

### Reading comprehension

31% of the children lost the ability to read non-textbook materials with comprehension.

Voices from the field

*"Reading has become a bigger problem than before across grades. Students of class 6 could not answer even the story-based questions or get the meaning of the text. In other words, we can say that they can no longer read with comprehension. The situation with writing is even more troublesome – in the writing section, only one student of class 3 could write a sentence without errors."* (Teacher, Madhya Pradesh)

*"Our children of classes 3 and 4 were able to read, but now half of them have forgotten to read and the condition of writing has become worse. Children are unable to write even two to three sentences in the workbook."* (Teacher, Rajasthan)

*"Many of the children who were learning to read have forgotten the identification of letters (Hindi). Earlier I used to make them read the newspaper in school, ensuring each child got an opportunity. We had designed our assembly so that primary class students, especially from classes 4 and 5, got a chance to read the newspaper. But now, when they lack access to interesting resources and no one is around to motivate them, all our efforts have gone in vain."* (Teacher, Rajasthan)

## 3.3 Mathematical Abilities: Learning Loss

Assessment of mathematical abilities included identification of numbers, using basic arithmetic operations for daily life problem solving and description of 2D/3D shapes for classes 2 and 3, and measurement and data handling operations in addition to place value, fractions and arithmetic operations in classes 4, 5 and 6. Figure 2 summarises the analysis of learning loss for these mathematical abilities.

Figure 2: Percentage of children who have lost specific math abilities when compared to baseline

**Class 2**

**Numbers**

**20%** of the children lost the ability to identify single-digit numbers.

**Operations**

**33%** of the children lost the ability to subtract single-digit numbers using concrete objects.

**Problem solving**

**14%** of the children lost the ability to use addition operation to solve problems in daily life situations.

**Shapes**

**23%** of the children lost the ability to describe 3D shapes with their physical features.

Figure 2 (continued)

## Class 3

### Numbers

26% of the children lost the ability to read the numeral form of two-digit numbers from 21 to 30.

### Operations

37% of the children lost the ability to add two-digit numbers pictorially.

### Problem solving

48% of the children lost the ability to solve problems using subtraction operations in daily life situations.

### Shapes

44% of the children lost the ability to identify 3D concrete shapes from their surroundings.

## Class 4

### Place value

70% of the children lost the ability to identify greatest/ smallest three-digit number using place value.

### Operations

20% of the children lost the ability to subtract two-digit numbers without borrowing.

### Measurement

11% of children lost the ability to read the time correctly from a clock.

### Shapes

23% of the children lost the ability to describe features of 2D shapes.

## Class 5

### Fractions

25% of the children lost the ability to find the fractional part of a given picture.

### Operations

55% of the children lost the ability to multiply two-digit numbers.

### Problem solving

39% of children lost the ability to use multiplication to solve problems in daily life situations.

### Measurement

67% of the children lost the ability to find the length of an object using a scale.

Figure 2 (continued)

**Class 6**

**Fractions**

**52%** of the children lost the ability to identify equivalent fraction of a given fraction.

**Operations**

**40%** of the children lost the ability to perform division of four-digit numbers by a single-digit number.

**Data handling**

**21%** of children lost the ability to represent data in a table using tally marks.

**Measurement**

**60%** of the children lost the ability to classify angles into right angle, obtuse and acute angle.

Voices from the field

*"Learning loss is greater for students of class 2 because they have forgotten the basic understanding of numbers."* (Teacher, Rajasthan)

*"Earlier, children could add using numbers in their notebooks. Now they can add numbers when asked to do so verbally but are unable to do the same on paper. This is probably because dealing with numbers as a quantity is a part of their context – they count their goats, cattle, marbles (for playing), and money for buying anything – they have lost the ability to use symbols for numbers."* (Teacher, Madhya Pradesh)

## 3.4 Learning Loss: Lived Realities of Teachers, Learners and Parents

The findings from the analysis of the assessment data reveal only a part of the story related to learning loss among public school children during the period of school closure. The narratives from the field that were generated from families and children while the study was being done provide a snapshot of the context in which these key stakeholders find themselves.

Most of the public school teachers associated with the study were themselves intensely troubled to learn first-hand about the extent of learning loss that their children have experienced during the period of school closure. Some teachers became emotional when they realised that children whom they tagged as 'intelligent' and could earlier 'read so fluently, write so nicely and perform operations so easily' were now struggling with 'such simple questions'. Moreover, they along with the assessors could directly experience how children have been totally disconnected from the school.

Voices from the field

*"Last year the child who was in class 3 is now in class 4, and in the current session, very little has happened. So, in this situation, the child will be in class 5 (in the next session). How can that child be brought to class 5 learning level? Worse, mostly the situation is that some children have not even retained learning levels of class 3."* (Teacher, Madhya Pradesh)

*"I had a feeling that children will lose the habit of sitting in the classroom, and they would have had some loss of learning as they could not learn new things from their syllabus of class 4. But I never imagined that so many of them will also forget what they had learnt in the previous class."* (Teacher, Chhattisgarh)

Teachers surmised that given that most children in a regular scenario cannot remember what they learnt in the previous class, the long school closure has, in effect, meant that there is a gap of one year between two academic years, and managing this learning gap will be a very difficult task. They also pointed out how this gap is further compounded given that some children were not at the appropriate class level even for the previous class. Teachers shared that they, therefore, are in a 'double dilemma' – whether to start from last year's course work (2020-21) or the syllabus of the new class (2021-22).

During the visits to the communities for the assessment of children, parents were found to be deeply worried about their children's education and constantly wanted to know when schools will open. They kept asking that if children could interact with each other in the community, why could they not do so in school as well? They were worried that children have forgotten all that they had learnt, since they do not 'read anything' at home.

Many of the children thought the assessment signalled the opening of school; numerous children from all classes converged to the assessment site with this hope. Some children did not even want to go back home after the assessment was done. How children are also looking forward to the reopening of schools is evident in this remark from one of them – 'if marriages, processions, and cricket matches are on, why are schools closed?'

The teachers were quite categorical that they wanted the children to come to school as soon as possible so that teaching can start systematically. Many of them have experienced the half-hearted efforts of online education and were aware of the limitations of such efforts to achieve any meaningful learning. They underlined how there is no alternative to physical classroom learning, where students work in groups and their learning process takes place in a collaborative and facilitating environment. Teachers felt even home visits are a poor substitute for school-based learning. The concern of teachers extended beyond academics – they were worried about 'social loss' and also the impact of the learning loss on children's ability to navigate adult life.

Like the assessment data, the narratives from the fieldwork reinforce the urgent need to have a systematic plan to reorient key public school processes so as to compensate for learning loss among children as schools reopen.

Voices from the field

*"Schools have been closed for children for 10 months. The most affected due to this are the students of primary classes. Most of the students who study in government schools belong to rural areas. Online classes could not do much to aid the learning of these children. Parents of many of them are not educated at all and could not support them at home. Now we can see our children working in fields and tea-stalls, taking care of their younger siblings all day at home, girls cooking all the meals for the family and doing other work in the households all the time. School provided them a platform to learn what they could with minimal requirement. This routine is completely broken down and now we fear that many of them might have lost their interest towards studies."* (Teacher, Rajasthan).

*"I was coming to school and meanwhile, I met one of my students on the way. He had started working in a cloth shop. When he met me, he said,* 'मैडम सूट ले जाओ बहुत अच्छा – अच्छा आया है' *(buy a salwar kameez set; nice ones have arrived for sale). A similar kind of incident occurred later – one of my students met me and he was working at a shoe shop. He said to me,* 'मैडम, बहुत बढ़िया सैंडिल आये हैं, दुकान पर आना' *(very nice footwear has arrived; please come to the shop). I was thinking that rather than talking about education, the children have started talking about business."* (Teacher, Uttarakhand).

# Conclusion

The learning loss due to COVID-19 is indisputable. All children across primary classes have been impacted, with most children who are returning to school not ready, in terms of expected abilities, for further learning at the appropriate class level.

The impact of learning loss due to children forgetting what they had learnt earlier is likely to be further compounded if nothing is done to compensate for this loss when schools reopen. Children will be pushed towards more complex learning abilities of the new class they will move to without having the prerequisite foundational abilities. This compounding of learning loss will expectedly be more for students from disadvantaged backgrounds who access the public school system.

It is critical to understand that this learning loss is not limited to public schools. Learning of significant numbers of children in private schools has also been interrupted by the pandemic. Even where private schools have taken the initiative of reaching children through remote modes, very little actual 'online teaching' has occurred; mostly, instructions and supplemental resources have been shared.[8] Thus, the issue of learning loss must be addressed for all children across all types of schools and across all classes in schools.

The principles of access, equity and inclusion that must inform school education are likely to be further tested in these circumstances. We must act now to ensure that the lost academic year as well as the loss of whatever learning children had acquired from the earlier class do not cumulatively impact the long-term prospects of our children. It is reasonable to assume that school closure and no direct teaching-learning with children have contributed significantly to the learning loss of children. Reopening of schools and resuming direct teaching-learning is key to address this. However, a business as usual approach as schools reopen will not work – the extent and nature of learning loss must be identified to inform policy and processes as children return to schools.

[8] Oxfam India. (2020). Status report – government and private schools during COVID-19. https://www.oxfamindia.org/sites/default/files/2020-09/Status%20report%20Government%20and%20private%20schools%20during%20COVID%20-%2019.pdf

While this study gives us a sense of the extent and nature of learning loss, we need more understanding to address this in the classrooms – for example, we need to understand why the loss in some specific abilities is higher than in others. Effective school-level strategies will require to factor in these nuances, and this calls for a finer understanding through more detailed and continuing research in this area over the ensuing academic year.

Supplemental support, whether in the form of bridge courses, extended hours, community-based engagements, and teaching-learning materials will be necessary to help children gain lost abilities and to further their learning in the class they return to when schools reopen. While a portfolio of pedagogical approaches based on a finer understanding of the situation can be developed and made available, each teacher will have to address the specific situation in her classroom. It follows that teacher capacity to ensure student learning in these unusual circumstances must be in focus, particularly with respect to pedagogy and assessment needed to deal with students at diverse learning levels.

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