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Teaching Mathematics to Early Graders During Lockdown in Delhi: A Challenge

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Abstract

The COVID-19 pandemic is going to kill the sensitive and critical period of mathematical learning. This pandemic is leading towards a learning crisis. The continuous closure of schools is going to affect the learning process of first and second graders in negative ways. This adversity faced by the education system now is going to seriously affect us in silent ways. The "early years" suffered a lot. This has inspired the researcher to examine the effects of the lockdown on the teaching and learning of mathematics with regard to early graders in Delhi. Many classes were observed, and parents, teachers, and School Management Committee (SMC) members were interviewed to understand the real issues and challenges. The COVID-19 pandemic was unprecedented and never expected to be one of the most significant pandemics of the modern era. It led to the closure of schools and a paradigm shift in the way learning is accessed. This shift was made with almost zero planning. The apps made in western countries to complement their education systems were adopted in India without a single alteration. Teaching mathematics online to early-year learners is problematic. Among the challenges that were found, the major one was the short attention span of the children. Others include the complicated manner of reaching out to children, and uneven access to technology.

Introduction

The COVID-19 pandemic is one of the most significant and long-lasting crises of this modern era. This is the first novel pandemic for a technologically advanced society. The epicentre of the pandemic is Wuhan, China, but the effects of this pandemic

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have been more severe in other parts of the world. All the countries in the world are racing to slow the spread of the virus. Their efforts include aggressive testing, timely treatment, contact tracing, travel restrictions, and quarantining. The coronavirus can be spread through human-to-human transmission; it is the main reason for the adoption of social distancing (also called physical distancing).

The COVID-19 pandemic has affected all spheres of life, including education. This pandemic has resulted in the almost total closure of schools, colleges, and universities. This state of closure began in March 2020. On the 24th of March, all the state governments and autonomous bodies started closing down schools. This closure was considered a temporary measure to contain the spread of the virus. Now, in September 2020, there are restrictions on public gatherings and the closure of schools is still mandatory. We can say that this pandemic has significantly disrupted schools and higher education. The novel coronavirus has hit mainstream education severely. Strict stay-at-home orders and physical distancing measures are quite common even today. All schools and educational institutions are directed to be closed, even in unlock 4.0.

The situation demands serious attention because there is no certainty of the re-opening of schools and educational institutes shortly. The recent announcement made by the state government says that all schools and educational institutions will remain closed till the *Durga Puja* holidays. This is affecting crores of young learners in our country. The early graders are suffering a lot as these are critical years for achieving Mathematical Literacy. It inspired us to examine the effects of the corona pandemic on the teaching and learning of mathematics in early school years, classes I and II.

Mathematics at Early Years — Curriculum in Grade I and II

Currently, in Delhi, pre-schooling is a choice; it is not mandatory for children to attend. This is the primary cause of a lack of preparation in early mathematical concepts such as pre-number concepts and pre-number vocabulary. The children admitted to Class I are unprepared to learn number concepts and other important concepts. So, in India, the curriculum is designed in such a way that the things a child should have learnt in pre-school (ideally) will be learned in Class I. The learning outcomes of mathematics for Class I include spatial vocabulary, such as top-bottom, above-below, on-under, near-far, thin-thick, and in-out, language to describe physical features of shapes—sliding and rolling, and pre-number concepts, such as seriation, classification, unitising, one-to-one correspondence, and so forth. Further, the child is allowed to explore numbers from 1 to 9 in the first go, and then up to 20 after acquiring the knowledge of addition and subtraction with numbers from

1 to 20 in the context of daily life. The curriculum of Class I requires a child to recognise numbers up to 100 (recognition and writing numerals), estimate lengths in different non-standard units, observe patterns and create patterns, and develop the concept of zero as a number. In Class II, the focus is on using the place value concept in reading and writing numbers up to 99, performing addition and subtraction using re-grouping, describing basic 2D and 3D shapes, using non-standard units for measuring distances and capacities and comparing them, using a calendar and data collected.

Due to the closure of schools, these concepts are now being taught by schools through online live classes, which are conducted for students who are technologically advanced, and offline worksheets, which are meant for students who have limited access to technology. The online classes and worksheets are supposed to help students learn the basics of mathematics, which are foundational to further mathematical exploration. The difficulties and challenges of the online classroom and digital learning are explained in the following section.

Paradigm Shift with Zero Planning

The pandemic was unprecedented. It has come to be one of the most significant pandemics of the modern era. Closing down everything to control the spread of infection among people and to maintain physical distance was the need of the hour. This led to the closure of all schools, affecting all the early graders. In the initial days of this crisis, it seemed that it would not last for a long time and things would take their ordinary course soon. Hence, no special efforts were made to introduce virtual meetings and online interviews with early graders. After 14–19 days of lockdown, everyone came to realise that the situation is not going to change anytime soon. All the schools and Aanganwadis were closed due to the physical distancing measures.

So, the initial efforts went into determining clear-cut rules for arranging classes for each subject and taking classes online using the available platforms. However, usability, creditability, accessibility, security, privacy, functionality, and familiarity were not considered while choosing online teaching platforms. The acceptance of these things blindly, undoubtedly, had certain ramifications. This is explained later in this article.

Choosing the one option from the only option available to us was not difficult. Teaching online was our only option. Schools and educators started using online platforms for delivering instructions with a little introspection and almost zero planning. Online learning is not easy for small children. I remember one of the interactions that I had with Class II kids using an online platform. I was talking about some situations of addition and subtraction in different contexts using PowerPoint. After my presentation, I asked, "Why do

we have 44 marbles?" Shreya said, My tooth is loose." Arjun said, "My mom hates puppies." Rajashree said, "I love cheese pizza." And there were many other out-of-context responses. The point here is that children have short attention spans, and it is near to impossible for teachers to prepare video or audio content that is good enough to retain their attention for long. It is wrong to assume that children will pay much attention to the mobile screen when everything around them is so hectic.

While observing the mathematics classes, we found that the teachers were using simple slides to initiate discussions with the students of Classes I and II. Some of the observations are stated as follows:

- "It was 9 a.m. A primary teacher was teaching mathematics online to Class II students. The topic was addition and subtraction without carrying over. Only 19 students were attending that particular class out of the total strength of 45 students. The teacher was using a blackboard for teaching the concept of addition. He gave many sums for practice (before explaining anything). The following were the exact sums that were visible on the board.

5	12	4	6	25
+ 1	+4	+5	+3	+3

- Then, he asked the students to add five apples and one apple together. One of the students gave the answer as six apples. The teacher wrote six in the 5+1 column. Other students seemed to have become serious at that point. The teacher proceeded further to solve the next question. He said, "Twelve apples and four apples together make how many apples." He used the pointer on the board to locate the problem. Two students said, "Six apples." Others preferred to look at the boy who gave the first answer correctly. The teacher asked that boy, "Hasan! You tell me."Hasan replied hesitatingly, "5...umm, aaaaa...16." The teacher accepted this answer as the final one, and no discussion was made upon the wrong answer that was given by the two students.
- The teacher went to the next question and asked, "Four eggs are added to five eggs. Now, how many eggs do we have?" A student said, "I love omelette sir; I am feeling hungry." The teacher scolded him for the next two minutes and asked him to focus on the class. The teacher asked others to answer the question. All the students preferred to ignore it. And then, the teacher explained how five eggs and four eggs make 9 eggs.

- At that point of time, only 12 students were attending the class; seven had left the class. When the teacher asked the students about their understanding of the concept, some students said, "Sir, *apki awaz theek se nahi aa rahi*." (Your voice is not clear). The teacher got tired by now and ended the class, instructing the students to do the remaining sums as a hometask.
- Another online class was observed that was being given by a teacher of a different school to students of Class II. The maths teacher was teaching the concept of more than and less than (comparing numbers). Only 21 pupils were attending that class. The pedagogy of this class was almost the same as that of the previously observed class; the only alteration was the use of PowerPoint in place of the board. Two slides appeared with the following questions written on them.

(The figures given below are based on memory.)

Slide 1

Circle the biggest number in the given rows.
7, 8, 3, 5
14, 61, 27,9
65, 21, 82, 69
22, 36, 49, 71

Slide 2

Circle the smallest number in the given rows.
65, 21, 82,69
22, 36, 49, 71
7, 8, 3, 5
14, 61, 27,9

- With respect to the first slide (biggest numbers), almost all the students were crying out to say the answer (i.e., eight). Some children said 27, while others said 61 and began shouting. The teacher told them that the correct answer was 61, and then he proceeded to the next question. The attendance of the students was decreasing because they were starting to feel bored. The answer to the next question was 69 for some, 65 or 82 for some others. The students were giving random answers without a thought. This shows a lack of conceptual understanding and low-quality instructions. Then came the next slide (smallest numbers), even when the students had not mastered the previous concept. The teacher gave all the answers at once and asked them to copy them down in their notebook. Then, the class ended.

While discussing the issues related to online learning with

teachers, one of them said that it is tough for us to hold the attention of children in an online class. The environment in most homes is very distracting. It becomes hard for us to capture and retain the attention of children for long. Whenever the mathematics class begins, half of the students leave the class and others do not participate in the discussion. Another teacher added that teaching mathematics online to early years is very challenging. You cannot really capture the attention of students by explaining something. Undertaking appropriate drills and practices is not possible in online classes. We suggested they use the activity method. They should make more lively and concrete activities. They must use resources that are easily available at home to make the activities, so that the students can also perform them easily. This method can prove to be an effective way of engaging them in online learning.

Reaching Out to the Children Was the Greatest Achievement

Teachers admitted the fact that reaching out to the children was very difficult for them. The migrant workers who went back to their villages because of lack of work and the consequent lack of money took their children too. The children of migrants, who are now living in villages, are at risk of dropping out of school. Teachers in Delhi are trying to trace them through a contact tracing technique and sending them worksheets to keep them connected with school education. Interviews with teachers made us aware of the techniques they used for tracking students. One of my friend from my previous workplace said, "I called all the students to ask them about the contact method which is convenient for them. The students who were not in my contact were traced using the SMC and her friends living in the neighbourhood. This method was useful for reaching out to all the children." Contacting the children of Classes I and II was the most difficult task. Being so young, these children have the least access to mobile phones in the family.

Further, we found that you cannot teach the students only by keeping in touch with them and sending worksheets. The young students have no motivation for completing these worksheets, and the feedback, which is most essential at this stage and crucial for developing future understanding, is limited. Students of classes I and II, whose parents are illiterate, are the most vulnerable. Close collaborations between parents, teachers, different schools and educational setups are the need of the hour. For instance, the children who migrated from Delhi to Bihar should be dealt with by Bihar schools with the help of Delhi (if needed). Small children are greatly impacted by what the children around them are learning. The children in the villages are learning things which are different from what our migrated children

have learnt or are learning. This can leave them in a dilemma. It is always advisable to teach a child the same content as her peers are being taught. The same content and topics have more impact on one's learning in the early years.

Uneven Reach to Technology

One of the greatest barriers to remote or distance learning is that one's accessibility to technology is of utmost importance, and there is a positive relationship between "access to technology" and online learning. The limited access is mainly responsible for the limited opportunity for learning. In the schools that are under the Delhi government, majority of the children belong to the poor or the middle class. It is tough for them to attend classes online. In fact, online classrooms are inaccessible to most of the children in the country. These classes are doing more harm than good; they are making the gap between the privileged and the underprivileged wider. All the schools in Delhi are pretending to take classes online. How strange it is to assume that all our students are learning online when we know for a fact that majority of the students belong to lower-middle to poor class families.

Talking to the parents of the students helped us to learn about the difficulties they are facing, which are restricting them from making online classrooms available for their children. The mother of a government school child said, "My husband died a long time ago. I am the sole bread earner of the family. I have two kids; the girl is 10 years old, and the boy is 7. The lockdown disrupted my wages, and we do not have enough money for groceries. I cannot afford online classes for my kids. I did not know how to react when school teachers said that attending online classes is compulsory for every child."

This situation is the result of the massive gap between the privileged and the underprivileged. Uneven access to technology is a severe barrier. We need to make sure that this limited access to technology does not become the reason for ignorance.

Conclusion

The Covid-19 pandemic is one of the most significant and long-lasting crises of this modern era. It has affected all spheres of life, including education. It has resulted in the almost total closure of schools, colleges, and universities. This is affecting crores of learners in our country. This adversity faced by the education system is going to seriously affect us in silent ways. The "early years" suffered a lot.

The curriculum for Classes I and II mainly includes counting, and addition and subtraction up to 99. Due to the closure of schools, these concepts are being offered online through live classes to students who are technologically advanced. The students who have limited access to technology are being sent offline worksheets. However, the effectiveness of both method of imparting education is doubtful.

Teaching online was the only option to choose from. Schools and educators have started using online platforms for delivering instructions with little introspection and almost zero planning. Online teaching for small kids is very challenging because their attention span is short. Some discussions with teachers also helped in understanding the difficulties faced by them, such as difficulties in reaching out to children, holding their attention, making them understand the use of electronic devices, and so on. The limited access is mainly responsible for the limited opportunity for learning. It is tough to conduct online classes for the students of the Delhi government schools, as a majority of those students belong to lower-middle to poor class families. Most children in the country do not have access to online classrooms. Teachers have to work harder to ensure that access to technology does not become the only factor shaping learning during the pandemic.

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