

## Learning Loss due to School Closure: A Systematic Review

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### Abstract

In Sri Lanka, students have faced multiple instances of school closures, stemming from various factors such as the COVID-19 pandemic, the Easter attacks, teachers' strikes, and the economic crisis. Existing research has consistently indicated that even planned school holidays can lead to significant learning loss among students. This study aims to provide a review of the literature on learning loss resulting from school closures in diverse contexts, with a focus on understanding the potential impacts on education. The study employs a qualitative methodology, conducting a systematic literature review. Articles published in English between January 1, 2022, and August 31, 2022, were included in the initial search, with a specific focus on primary and secondary education while excluding tertiary education. Key electronic databases such as Google Scholar, the Education Resources Information Center, and the Cochrane Library served as the primary sources of reference. The search incorporated keywords such as "school closure," "learning loss," and "education gap." Inclusion criteria involved studies that conducted student analyses and reported on the effects of school closure on learning progress, whether positive, negative, or negligible. After applying these criteria, six articles were selected for analysis. These articles were coded based on various parameters, including the nation of study, the duration of school closures, the educational level, the subject, observed effects of learning loss, impacts of equality, and the sample size. Of the six studies analysed, five highlighted learning loss in subjects such as Mathematics and Languages, while one study found no significant overall learning loss due to school closure. Two articles underscored the substantial influence of economic status on learning loss, while three indicated that students from lower economic backgrounds did not experience distinct learning setbacks. The study identifies several contributing factors to learning loss, encompassing parental qualifications, student grade level, subject matter, the duration of school closures, and the economic status of the country. It is recommended that future research delve deeper into the nuances of learning loss, explore regional disparities, and investigate the multifaceted factors influencing this phenomenon.

**Keywords:** *Education Gap, Learning Loss, School Closure*

## **1. Introduction**

The COVID-19 pandemic has profoundly changed society, exacerbating economic and social inequality. The COVID-19 pandemic was not only a health crisis, but also an educational crisis, as 1.5 billion children did not have access to proper common schooling (The World Bank, 2020). Attempting to stop its spread, governments worldwide suspended face-to-face teaching in schools; it affected around 95% of the world's student population and caused the biggest disruption to education in history (United Nations, 2020).

The students in Sri Lanka experienced school closure not only due to COVID-19, but also due to the Easter attacks, teachers' strikes, and the economic crisis. According to survey results, children had spent much less time studying during the lockdown (Andrew et al., 2020; Bansak & Starr, 2021).

The World Bank Report (2022) emphasises that without immediate intervention, a Grade Three student who has missed one year of school due to the pandemic might eventually lose up to three years' worth of knowledge. It also states that the learning volume lost due to the crisis will have a high economic cost. According to a recent estimate, today's pupils would lose \$17 trillion of lifetime earnings, if immediate corrective actions are not taken (UNESCO, 2021). Engzell et al. (2021) state that the most common causes of learning loss are lengthy gaps or discontinuities in a student's education.

### **The Effects of Past School Closure on Education**

The Education Endowment Foundation (2020) indicates that any gap in schooling, even routinely scheduled holidays, can cause a significant learning loss. Slade et al. (2017) state that in Malawi, transitional breaks from Grade

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One to Two, and Grade Two to Three lead to an average reduction of 0.4 standard deviations on four different measures of reading skills.

According to Baker (2011), during a 20-day school closure due to teachers' strikes in Ontario, Canada, a learning loss occurred in the Mathematics test scores, equal to half (0.5) of a standard deviation. Wills (2019) discovered that, in South Africa, students' performance in subjects taught by a teacher who did not engage in strikes was approximately 0.1 standard deviations higher than the subjects taught by a teacher who struck. According to studies examining the effects of closing schools due to severe weather and natural catastrophes, there are significant negative effects on learning due to school closure.

In the United States, Marcotte and Hemelt (2008) discovered that for each day schools were closed due to snow, the performance of students in Reading and Mathematics decreased by 0.5%; in a year with five consecutive days of snowfall, it lessened by approximately 3%. Similarly, Andrabi et al. (2020) state that the school closure of nearly 3.5 months in Pakistan after an earthquake caused a learning loss that is equivalent to 1.5 school grades.

There were prolonged school closures during 2013–2014 due to the Ebola outbreak in West Africa which caused a severe effect on education. This learning loss is associated with poor school attendance, a higher dropout rate, and increased social violence such as child abuse, early pregnancy, child labour, and nutritional deficiencies (Bakrania et al., 2020).

## **2. Methodology**

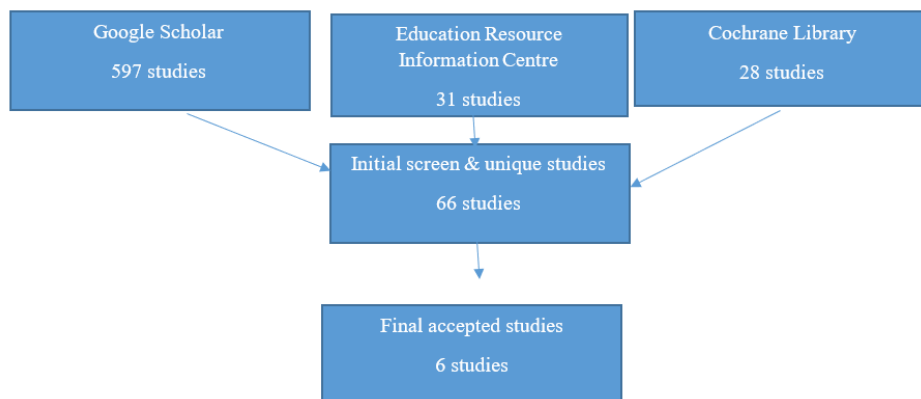
### **Search and Review Strategy**

The preliminary study was conducted using articles that were written in English and published between January 1, 2022, and August 31, 2022. General education, i.e. primary and secondary education were considered, and university education was ignored. For the purpose of facilitating a comprehensive and interdisciplinary search, the following electronic databases were accessed: Google Scholar, the Education Resources Information Center, and the Cochrane Library.

The search was conducted using the keywords: “School Closure”, “Learning Loss”, and “Education Gap”. During the search analysis, a substantial volume of publications were retrieved; nevertheless, the majority of these pertained to anticipated or projected learning loss. Thereafter, article abstracts were screened to narrow down the studies.

Studies that analysed student performance and reported the effect on learning (either positive, negative, or insignificant) due to school closure were included. After the vigorous inclusion and exclusion process, six articles were selected (Table 1). The articles that did not have proper analyses or recorded impacts, that only focused on remedial actions and hypothesised results were eliminated.

**Figure 1**



## Definitions

Huong et al. define the term ‘Learning Loss’ as “any specific or general loss of knowledge and skills or reversals in academic progress, most commonly due to extended gaps or discontinuities in a student’s education” (2020, 79). Another popular definition of Learning Loss by Ari (2005) is the “inability to retrieve acquired information from memory”. Slade et al. (2017) define Learning Loss as “going beyond the determined planning, not gaining or missing the desired competencies, and naturally experiencing problems in reaching educational goals”.

## Characteristics of the Sample

Among the six studies examined, five reported that their sample consisted of students. Specifically, one study focused solely on primary students, two studies encompassed secondary students, while the remaining two encompassed both primary and secondary educational levels. In one instance, the sample was drawn from the teacher cohort. Regarding the subjects of the

analyses, four of the six studies conducted assessments of learning loss in both Mathematics and Languages, while one study exclusively examined Mathematics and another exclusively evaluated language proficiency. In terms of geographical distribution, five out of the six studies were conducted in European nations, while the remaining study originated from North America.

### **Analytical Study**

Following a rigorous selection procedure, a total of six articles were subjected to coding procedures, employing a standardised framework that encompassed key parameters. These parameters included the geographical location (nation), the temporal duration of school closures, the educational level, the observed effects of learning loss, the resultant impact on equality, and the size of the sample. This systematic approach was integral to ensuring a comprehensive and structured analysis of the selected articles within the research study.

The comprehensive examination process yielded notable findings, with five out of the six studies reporting substantial learning losses in specific subject areas. To elucidate, Felipe et al. (2022) observed a significant learning loss across all grade levels in Reading. Çigdem et al. (2022) identified various factors contributing to learning loss among middle school students in Turkey. Nicola (2022) discovered a pronounced learning loss in both Reading and Mathematics, with the most pronounced effects observed in students in Grades Eight and 13. Furthermore, it was revealed that even though Grade Five students exhibited learning loss, it was comparatively less severe than that was observed in Grade Eight and Grade 13 students.

Andreu's study (2022) delved into the examination of learning loss in Mathematics, the Basque language, and the Spanish language. The results indicated that Mathematics exhibited a higher degree of learning loss compared to the two language subjects. Notably, since the Basque language served as the second language for students, experienced a greater extent of a learning loss when compared to the first language, Spanish.

Turker's (2022) research also noted a significant difference in the scores between the subjects of Mathematics and Turkish language due to school closures. Interestingly, one of the six articles in the study reported no discernible learning loss when assessing reading skills in Swedish primary schools before and during the pandemic.

### 3. Discussion

**Table 1**

<b>Authors</b>	<b>Title</b>
Felipe J. Hevia, Samana Vergara-Lope, Anabel Velasquez-Duran, David Calderon (2022)	“Estimation of the fundamental learning loss and learning poverty related to COVID-19 pandemic in Mexico”
Çigdem Haser, Oguzhan Dogan, Gonul Kurt Erhan (2022)	“Tracing students’ mathematics learning loss during school closures in teachers’ self-reported practices”
Nicola Bazoli, Sonia Marzadro, Antonio Schizzerotto & Loris Vergolini (2022)	“Learning Loss and Students’ Social Origins During the Covid-19 Pandemic in Italy”
Andreu Arenas Lucas Gortazar (2022)	“Learning Loss One Year After School Closures: Evidence from the Basque Country”

Anna Eva Hallin, Henrik Danielsson, Thomas Nordstrom, Linda Falth (2022)	“No learning loss in Sweden during the pandemic: Evidence from primary school reading assessments”
Turker Toker (2022)	“Detecting Possible Learning Losses due to COVID -19 Pandemic: An Application of Curriculum-Based Assessment”

**Table 2: The Terms Used to Classify the Articles and the Descriptions**

<b>Term</b>	<b>Description</b>
Nation	The country of the sample
Length of School Closure	The number of days students do not study face-to-face.
Level of Education	Participants’ grades
Subject	The name of the subject
Effects of Learning Loss	The mentioned level of learning loss among the participants
Impact on Equality	Differences in the level of loss
Size of the sample	The size of the sample obtained for the study

**Table 3**

<b>Authors</b>	<b>Country</b>	<b>Closure length</b>	<b>Education level</b>	<b>Subject</b>	<b>Learning loss</b>	<b>Equality impact</b>	<b>Sample size</b>
Felipe J. Hevia, Samana Vergara-Lope, Anabel Velasquez-Duran, David	Mexico	Many weeks	Children between 10 and 15 years	Reading and Arithmetics	0.34–0.45 standard deviation in Reading, and 0.62–0.82 standard deviation	Yes	3161 students



Calderon (2022)					in Mathematics		
Çigdem Haser, Oguzhan Dogan, Gonul Kurt Erhan(2022)	Turkey	7 weeks	Middle school students	Mathematics	-	Yes	28 mathematics teachers
Nicola Bazoli, Sonia Marzadro, Antonio Schizzerotto & Loris Vergolini (2022)	Italy	25 weeks	Fifth, Eighth and Thirteenth graders	Reading and Mathematics	For students in Grades 13 and 8 the learning loss is significant ; for students in Grade 5, it is less significant and only has an impact on Mathematics.	Yes	National Examination results
Andreu Arenas & Lucas Gortazar (2022)	Spain	one year	Primary and Secondary Levels	Mathematics and Language	A 0.045 standard deviation; an average learning loss	Yes	5621 students

Anna Eva Hallin, Henrik Danielsson, Thomas Nordstrom, Linda Falth (2022)	Sweden	No	Primary Level	Decoding and Reading Comprehension	No learning loss	No	97,073 students (Grade 1-3)
Turker Toker (2022)	Turkey	Not mentioned	Eighth grade students	Turkish and Mathematics	The Math exam's score variation between 2016 and 2020 was 10.32 points or 50% of the test's standard deviation. Additionally, there was a 10.91-point discrepancy between the Turkish test results from 2016 and 2020, which is about half of the	Yes	4.501 students

					standard deviation.		
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As Table 3 shows, learning loss exists due to school closure. The findings of five studies show that students experience learning losses. Even though Anna et al. (2022) state that there was no learning loss, Sweden was the country that did not close schools during the pandemic. However, researchers emphasise that even though Sweden didn't close the schools, the attendance of teachers and students was significantly affected.

The learning loss is not similar among all the subjects. Andreu (2022) states that, compared to the language subjects, Mathematics has a higher learning loss. Likewise, Anna and Linda (2022), and Nicola and Loris (2022) revealed that learning loss is not significantly different among the different socioeconomic statuses, but Felipe et al. (2022) state that learning loss is severe among students of low socioeconomic statuses. Gender is also one of the factors affecting learning loss. As Turker (2022) states, girls are the most vulnerable group to experience learning loss during the closure of schools.

Most of the studies indicate that students experiencing learning loss in academic subjects have a severe loss of socio-emotional well-being compared to learning loss in subjects (Andreu, 2022). Most of the studies indicate that the family background, especially the mothers' education, is the most affecting factor for learning loss during school closures.

Because this subject is relatively new, education researchers have begun to study how students are affected by learning loss. However, a stronger understanding of how COVID-19 school disruptions have affected student

learning, is still needed. To support this, further studies are needed. Additionally, the current studies are limited in their geographical span.

There is no proper study conducted in the developing countries; especially in the Sri Lankan context. It is crucial that researchers continue to look at the degree of learning loss associated with COVID-19 in countries where there is little study done, since educational institutions vary greatly between countries in terms of quality, duration of school closures, and distance learning tactics. There were a few samples in several of the research examined in this systematic review. Policy-makers should prioritise research that properly reflects larger groups of samples of which the information supplied by these studies is pertinent to the observed samples. Therefore, research examining representative student groups is necessary.

#### **4. Conclusions**

This systematic review offers a thorough assessment of the current research on learning loss related to COVID-19. This was accomplished by conducting a detailed examination of published learning-loss studies spanning from January 2022 to August 2022. Following an extensive filtering process, six articles were analysed. Among these, one study reported no evidence of learning loss, while the remaining five studies provided indications of learning loss among the participants. Notably, two of these studies also highlighted an increase in educational inequality, with students from lower socioeconomic backgrounds experiencing more significant learning setbacks. To gain a deeper understanding of learning loss and develop effective remedial strategies, further research is imperative. This necessitates the utilisation of

appropriate assessment tools, larger and more diverse student samples, broader geographical coverage, and integration with insights from Neuroscience.

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