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Education in the time of COVID: What's the cost?

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Abstract: The immediate response of educational institutions around the world to the COVID-19 threat is to close schools. Despite its necessity, however, the suspension of classes—be it for a day, a week, a month, a year, or more—deprived students of opportunities to acquire essential skills and knowledge that mold individuals into productive members of society in the future. Per the human capital theory, these learning losses curtail future productivity and earnings. Moreover, neoclassical growth theories, which identify human capital as a key determinant of national income growth, strongly suggest that COVID-19 learning gaps may, ultimately, reduce long-term gross domestic product expansions. In broad strokes, this paper presents and discusses the available qualitative and quantitative data on the likely individual and social costs of education during the time of COVID. The study also draws attention to the need to gather more specific information on the nature and extent of the probable gaps in student achievements in order to formulate targeted intervention programs that can successfully accelerate learning recovery and, henceforth, mitigate prospective productivity and income losses.

Key Words: education in the time of COVID, school closures, learning losses, earning losses, learning recovery

1. INTRODUCTION

The immediate response of educational institutions around the world to the COVID-19 threat is to close schools. A handful of countries welcomed teachers and students back to their campuses after a few months—as early as April 2020 after the schools closed their doors in March of the same year (i.e., Denmark, Japan, Norway, etc.; Guthrie et al., 2020). Some took almost a year or more before attempting in-person meetings (i.e., the Philippines and Myanmar; Asian Development Bank [ADB], 2021). Others initially resumed face-to-face classes during the mid-to-latter months of 2020 only to call them off again owing to periodic COVID-19 positive cases resurgence (i.e., Bangladesh, Scotland, etc.; Guthrie et al., 2020; UNICEF, 2021a; "Bangladesh extends closure of schools over Omicron", 2022).

Meanwhile, various forms of distance learning/remote education delivery modalities were employed for the duration of school closures in most countries to ensure the continuity of education and provide students opportunities to develop, maintain, and hone essential skills despite the suspension of in-person classes (ADB, 2021).

Findings of previous studies, however, present compelling evidence that school closures and, in the case of the COVID-19 global health crisis, the abrupt switch to distance learning have caused significant and enduring damage not only to student educational outcomes but also to the welfare of society as a whole. Thus, this paper documents recent findings on estimates of COVID-19-related learning losses and the impact of these losses on productivity and individual and national incomes. The article also offers a glimpse of intervention programs that yield promising results in jumpstarting post-pandemic learning recovery.

2. METHODOLOGY

The discourse is grounded on the human capital theory, which posits that an individual possesses a set of skills or abilities that can be enhanced and expanded through investments in education and training (Almendarez, 2010; Becker, n.d.). Per the theory, there is a direct relationship between higher levels of education and productivity–more years of schooling results in the acquisition of more knowledge and the development/refinement of skills–which, in turn, raise lifetime earnings.

At the macro level, neoclassical growth theories attribute long-term national income expansions to human capital formation and technology. Education accelerates economic prosperity by fostering new ideas, propagating the application of new processes, and improving labor efficiency (Aras & Ozturk, 2017). Research findings confirm a positive relationship between an individual's additional years of schooling and overall economic growth. Barro (1998 as cited by Aras & Ozturk, 2017, page 50), for instance, ascertained that, in the 1990s, "one's pursuing his education one more year results in 0.44% increase in [economic] growth"; whereas, Hanushek, Jamison, Jamison, and Woessmann's (2008) study of 50 countries determined that an additional year of average schooling raised the average 40-year GDP growth rate by 0.37 percentage point.

Arguments at the micro and macro levels, therefore, conclude that education, which raises productivity, boosts individual and national incomes.

3. RESULTS AND DISCUSSION

Any interruption in schooling (i.e., school breaks, suspension of classes owing to inclement weather, etc.) brings about significant basic education learning losses. For instance, evidence shows that snow days in Maryland, USA reduced "the number of students who performed satisfactorily on state reading and mathematics assessments by 0.5 per cent for each day that schools were closed" (Marcotte & Hemelt, 2008 as cited by Conto et al., 2021, page 2). While fluctuating in degree, learning losses in a variety of subjects—which were traced to school closures owing to summer vacation, teachers' strikes, natural disasters, epidemics, and so on—were also documented in Africa; Ontario, Canada; Malawi; Pakistan; South Africa; and West Africa. Research findings cited the loss of "interest in learning while schools were closed" (Conto et al., 2021, page 2) as a rationale for the observed link between school breaks and learning losses.

Containing the COVID 19 virus transmission in 2020 to 2021 forced the longest global school closures. In Developing Asia, for example, face-to-face classes were prohibited for a minimum of 42 school days (in the Pacific) and a maximum of 375 school days (in South Asia; Molato-Gayares et al., 2022). Most countries attempted to temper the decline in student achievements attributed to the COVID-19 school closures by introducing distance learning approaches such as take-home packages, television/radio-based instruction, and/or online platforms (ADB, 2021).

Regardless of the chosen method, the implementation of remote education during the pandemic required parents/guardians, especially that of primary level students, to take on some of the instruction and supervision functions of classroom teachers. In the Philippines, for instance, "teachers provide[d] parents/guardians instructions on how to assist students in accomplishing the weekly learning activities. If and when necessary, parents and students [...] communicated with the teachers via text, messenger, and so on" (Castillo, 2021, page 3). Ergo, for the duration of the COVID-19 remote education scheme, virtually every home with school-age children in the world had to be quickly and involuntarily transformed into a classroom equipped, ideally, with the essential educational materials (i.e., books) and infrastructure and devices (i.e., internet and internet-enabled devices)—with parents/guardians serving as tutors—to aid the conduct of distance learning in the time of COVID.

While the consequences of the COVID-19 school closures and the adoption of remote education

strategies have yet to be fully and accurately determined, the following realities suggest that distance learning during the pandemic may be less effective as compared to pre pandemic learning delivery modes: 1) urgent shift from in-person to homeschooling deprived stakeholders of the time to plan and prepare for the needs of the latter (i.e., train teachers and parents; make available the necessary educational equipment and materials, etc.); 2) reported difficulty of students to focus on learning while at home (ADB, 2021); and 3) significant dropout rates when schools shifted to distance learning modes–Bangladesh, 13% of primary-level students in 2021, the Philippines, 10.6%, and so on (Molato-Gayares, et al., 2022 as cited by Castillo, 2021).

Early-stage education develops foundational skills, which when disrupted, hold students back and prevent them from moving up to the next levels (ADB, 2022). A systematic review of learning losses from the COVID-19 pandemic included studies that estimated learning losses across developed and developing countries ranging from 41% to 54% of a year of schooling (Dela Cruz, Adona, Molato-Gayares, & Park, 2024). Learning losses in various subjects were established in Europe (i.e., England, Belgium, etc.) and a number of low- and lower-middle-income countries (Maldonado & De Witte, 2020 & Rose et al., 2021 as cited by Conto et al., 2021). Whereas, in the US, the preliminary results of studies on the impact of COVID-19 educational strategies verified the erosion in Grade 3-8 student achievements of as much as 37% and 63% in reading and mathematics, respectively (Kuhfeld & Tarasawa, 2020 as cited by Conto et al., 2021). Similarly, in Developing Asia, comparisons of student achievements in reading and mathematics to the pre pandemic period revealed: 1) a 60% decline in reading learning progress from Grade 2 to Grade 4 in India; 2) that 40% fewer students in Grades 2 and 3 could read and comprehend text in Indonesia; and 3) a slowdown in the rate of increase in the number of Grade 5 students who can do 2-digit division in Pakistan (Molato-Gayares, et al., 2022).

Consequently, based on the Asian Development Bank's intermediate scenario (2021), learning gaps translated to an average loss in learning adjusted years (LAYS) of between 0.08 (The Pacific with the shortest school closures during the pandemic) and 0.55 (South Asia with the longest school closures during the pandemic) in the region (refer to Table 1).

Table 1: Developing Asia average learning losses

Subregion	*Average loss in LAYS	% decline in LAYS	Baseline LAYS 2000
Central Asia	0.24	2.93	8.32
East Asia	0.39	3.67	10.50
South Asia	0.55	8.56	6.46
Southeast Asia	0.35	4.20	8.34
The Pacific	0.08	1.28	6.59
Developing Asia	**0.29**	**3.78**	**7.72**

*Intermediate scenario estimate
Note: Reprinted from "Learning and earning losses from COVID-19 school closures in Developing Asia," Asian Development Bank [ADB], *Special Topic of the Asian Development Outlook 2021*, pp. 23-24, April 2021.

Using the 2000 LAYS as a baseline, therefore, a child schooled during the time of COVID in South Asia, on average, can expect to obtain 5.91 years of schooling by age 18 instead of 6.46 years. Furthermore, in Developing Asia, the reduction in average years of schooling in 2020–ranging from 1.28% to 8.56%--does not only limit the knowledge, skills, and expertise the present students could offer the labor market in the future (Almendarez, 2010; Becker, n.d.); but their expected average earnings as well (refer to Table 2).

Theory and empirical evidence contend that low-educated and less-skilled workers earn less than their more skilled counterparts. Indeed, controlling for socio-economic demographic factors—such as age, gender, household income, and so on—the literature bears out that, in general, individuals with higher levels of education receive earnings that "are almost always well above average [incomes]" (Becker, n.d., paragraph 3). For example, per Ma, Pender, and Welch (2019), the median annual earnings of high school diploma holders working full time in the US were 31.5% higher—US$40,500 versus US$30,800—than individuals who had less than high school

diplomas in 2018. The gap was higher, at 61.5%, between bachelor's degree recipients (with income of US$65,400) and high school diploma holders (with income of US$40,500) during the same year (Ma, et al., 2019). Likewise, in the US, individuals with more years of schooling were less likely to be jobless in 2018 as evidenced by the following unemployment rates: 3.4% among individuals with less than high school diplomas, 2.9% among high school diploma recipients, and 1.8% among bachelor's degree holders (Ma, at al., 2019).

Table 2: Developing Asia earning losses per student

Subregion	Earnings loss per student per year ($)	% decline in earnings per student per year	Baseline average earnings per worker per year ($)
Central Asia	56	1.6	3,552
East Asia	771	4.0	19,182
South Asia	78	4.0	1,948
Southeast Asia	167	1.9	8,663
The Pacific	42	0.6	6,509
Developing Asia	**180**	**2.4**	**7,637**

*Intermediate scenario estimate
Note: Reprinted from "Learning and earning losses from COVID-19 school closures in Developing Asia," Asian Development Bank [ADB], *Special Topic of the Asian Development Outlook 2021*, pp. 23-24, April 2021.

Furthermore, particularly in modern knowledge-based economies, a less-educated, less-skilled workforce slows down national income growth. More years of schooling enables individuals to, among others: "understand instructions and apply them to a new task"; "communicate and coordinate with others"; "evaluate and adjust to changing work environments"; "increase the ability to adapt to new technology", (Lau et al., 1991 as cited by Soesilowati & Salim, 2009, page 71) and facilitate the creation of unique goods and services. Consequently, preliminary research on learning losses during the pandemic and long-term national income growth predicts an average of "1.5% lower annual GDP for the remainder of the century" (Hanushek & Woessmann, 2020 as cited in Kasradze & Zarnadze, 2021, page 95).

Hence, based on ADB's (2021) calculations of the potential earnings loss per student for South Asia, for example, the 4% drop in earnings per student per year (refer to Table 2) will put pressure on an already softening economy–owing to a less productive labor force–to grow by at least 4%--with no change in population–just to maintain its baseline average earnings per worker per year of $1,948. For context, presently, the World Bank (2023) places South Asia GDP growth at 5.6% in 2024 and 2025 with a 1.1% rate of population growth in 2023 (United Nations, 2022). Medium-term national income growth, per the International Monetary Fund ([IMF], 2023), is estimated at an average of 3.9%.

Learning Recovery Programs

These findings galvanized private and public efforts to formulate and implement strategies for intervention on the national/regional and institutional (i.e., public versus private school remediation plans) levels. Educational institutions that have already implemented their learning recovery programs focus on: 1) establishing programs that cater to individual students' proficiency levels, especially for students who are at greatest risk (i.e., poor, rural areas, etc.). With the analysis of the standardized examinations, students are grouped by their level of proficiency. Learning activities and instructions–with the assistance of tutors/mentors–are then planned with the goal to move up each group of students to the next level ("Accelerating learning recovery", 2021); 2) designing and conducting self-learning programs—that account not only for differences in learning levels but also for differences in how students learn (i.e., visual, auditory, kinesthetic, etc.)—to allow students to catch up and, ultimately, master foundational skills. Self-learning programs may involve adaptive computer-assisted instruction (i.e., through educational technology programs)—or individualized paper-and-pencil self-learning programs—and asynchronous learning

activities that allow students to move at their own pace ("Accelerating learning recovery", 2021; Molato-Gayares et al., 2022). Educational technology programs, before the pandemic, were reported to be effective. For instance, the use of the Mindspark software resulted in doubling math test scores in India (Molato-Gayares et al., 2022); and 3) extend instruction time (i.e., prolong the current school calendar, offer short/bridging courses, hold summer classes) particularly for the subjects/skills—identified by the analysis of the standardized examinations—that require the most attention (i.e., with the largest learning loss).

The Philippine Experience

Owing to the COVID-19 instigated lockdowns, the Philippines is one of the top three countries that kept educational institutions closed the longest (UNICEF, 2021b)—with all schools closed for more than 200 days (ADB, 2021). Rapatan, Ballada, Ibanez, and Villadolid (2022, page 12), via a survey of Philippine schools, identified top three sources of "loss of knowledge and skills" owing to the gaps in student education during the pandemic, namely: 1) "incomplete submission of learning tasks assigned to students (80%)"; 2) "low quality of student's outputs in performance tasks (59%)"; and 3) "students' attendance records (45%)." Majority of the surveyed Philippine schools (37-52%) reported that students, on average, performed about the same in the summative assessments during the pandemic as compared to before COVID-19. More than a quarter of the Philippine schools included in the study, however, observed that students, on average, received lower marks in the summative assessments during the COVID-19 school closures as compared to the pre-pandemic period, particularly in the core subjects: Math (38.6%), Science (32.5%), and English (27.6%).

In response, the Department of Education launched the National Learning Recovery Program in 2023, which included "extending school calendar, expanding of learning time, establishing learning support centers in schools and community-based learning spaces, conducting summer learning remediation and intervention programs, and hiring of additional learning support aides" (Torio, 2022 as cited by Espinosa, 2023, pages 634-635).

4. CONCLUSIONS

The preceding discussions presented the recent findings on the likely individual and social costs of education in the time of COVID. Theory and empirical evidence point to potentially considerable learning and income losses of school closures and the impromptu shift to remote education in 2020 to 2021, particularly in Developing Asia.

Various intervention programs are currently being implemented to accelerate the recovery of the loss in the acquisition and mastery of basic knowledge and skills during the time of COVID. Nonetheless, mitigating these losses on the national level requires a country-based approach that starts with testing SY 2020-21 students on various subjects—prioritizing foundational skills/courses (i.e., literacy and numeracy). Comparing the results of the standardized exams at both the national and subnational levels (i.e., the Philippine's National Achievement Test) to outcomes for say, primary school students aged 7-12 years with differing demographics and school characteristics, over a three-year period—perhaps AY2018-2019, AY2019-20, and AY2020-21—may reveal the extent of learning losses during the COVD-19 lockdown. The analysis is likely to disclose disparities in performance depending on gender, socioeconomic status, grade level, subject, and tuition-free versus tuition-based educational institutions (Molato-Gayares et al., 2022), which opens the door to customizing learning recovery strategies to address the needs of specific sectors.

Timely, relevant, and reliable information on the specific type and extent of learning losses in SY 2020-21 can, thus, be used to expedite learning recovery, which would not only guarantee the most efficient use of the country's limited resources (i.e., budget for education); but also, hopefully, mitigate future individual and national income losses.

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