

# Home Schooling during the COVID-19 Pandemic

## An Assessment of Malaysia’s PdPR Programme

**M. Niaz Asadullah**

*Governments worldwide have introduced various programmes to facilitate distance learning in home settings during the COVID-19 school closure. However, given cross-country variations in state capacity, these schemes differ significantly in design, delivery and coverage. Within-country variation in poverty and home conditions also create added challenges for home-schooling programmes. Therefore, case studies examining country-specific initiatives are necessary. To this end, this paper examines the Pengajaran dan Pembelajaran di Rumah (PdPR) in Malaysia, an upper-middle-income country with high Internet coverage and a low level of extreme poverty. Data come from a purposefully designed nationwide social media survey on secondary school children conducted in January 2021. Under the PdPR scheme, the government created various technology-based platforms to ensure online learning. By way of studying children’s participation in educational activities during school closure, this paper presents a descriptive assessment of PdPR. We first develop a conceptual framework to summarize the initiative. Then we examine the scheme in three aspects: the regularity of online lessons offered by school authorities; the extent of use of specific components and the medium of access of PdPR by learners; and their subjective evaluation of and difficulties faced with online schooling. Data confirm a significant socio-economic divide by income and location in access to EdTech as well as home support provisions. Most importantly, online lessons are irregular, and a significant proportion of students find online programmes challenging to follow. Given the dissatisfaction, most prefer to return to onsite education once schools reopen.*

**Keywords:** COVID-19, EdTech, learning crisis, home-based education, school closure.

### 1. Introduction

Following COVID-19, there has been a global push for home-based teaching. In most instances, the distance learning strategies deployed in response to sudden school closures were “emergency remote

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education” (Dreesen et al. 2020; Toquero 2021). At the same time, there is concern over the digital divide and learning loss (Avanesian et al. 2021; Azevedo et al. 2021; Asadullah and Bhattacharjee 2022; Engzell et al. 2021; UNESCO, UNICEF, and World Bank 2020). Such losses are likely to be larger in countries and communities with poor social and physical infrastructure and/or prolonged school closures (Engzell et al. 2021). Malaysia, too, has suffered significant disruptions to schooling and is an important case study.

While many developing country governments have introduced popular media and Internet-based distance learning schemes, these are mostly on a piecemeal basis and lack coordination. On the other hand, soon after the school closure, the Malaysian government launched the *Pemakluman Pelaksanaan Pengajaran dan Pembelajaran di Rumah* (PdPR),<sup>1</sup> a comprehensive home-based learning programme. In addition to launching a blueprint for implementing the scheme, the government increased investment in education technology.<sup>2</sup> According to a recent global Survey on National Education Responses to COVID-19 School Closures, Malaysia ranks very high among upper-middle-income Asian countries in terms of access to digital technology at home (Internet and computer), including mobile phones and television (Asian Development Bank 2020). The country’s pre-existing digital readiness could be crucial in averting a major learning crisis through PdPR.

Despite the early intervention and a wide range of activities and services introduced under the PdPR scheme, there is growing concern about its effectiveness. No comprehensive assessment exists documenting student participation in and experience of the initiative. In general, very little exists about the learning experience of Malaysian students during school closure. On the other hand, popular media have regularly reported various problems encountered by parents, students and teachers. Effective implementation of home-based learning requires a supportive family environment and complementary educational infrastructure. However, beyond the digital/technology access issue, not much attention has been given to the role of parents and families.

If the effectiveness of remote instruction is low, then according to one estimate, learning loss is likely to be the highest in Malaysia compared to other Asian developing countries (ADB 2021). The risk of such loss is significant given pre-pandemic learning poverty: 13 per cent of children in Malaysia are not proficient in reading (World Bank 2019). Malaysia also lags behind other High Performing Asian Economies (HPAEs) in the international assessment of student achievements (Perera and Asadullah 2019). These concerns motivate us to examine Malaysia’s PdPR programme critically.

The general research objective of the study is to offer an assessment of the scheme in the context of learning continuity during school closure. The three specific research questions are as follows. First, what is the learning landscape at home in terms of household provisions and preparedness to support PdPR? What were some of the main constraints? Second, what has been the experience of online learning and participation in PdPR? Third, how did learners evaluate the programme? What is the attitude towards school reopening? To answer these questions, we use nationwide data from a purposefully designed cross-sectional social media survey. The study sample has a good representation of children from different income groups and COVID-affected families. The focus is entirely on secondary school students from the majority Bumiputera ethnic group, and the analytical approach is descriptive.

The rest of the paper is organized as follows. The next section explains the study context and conceptualizes PdPR. The third section describes the data and sample composition. The subsequent section presents the main findings, while the fifth section discusses the results highlighting their policy significance. The final section concludes.

## 2. Country Context: MCO, School Closure and PdPR

As in other countries, schools in Malaysia were closed from 18 March 2020, following the first movement order control (MCO). This affected 4.9 million students. The first MCO period lasted from 18 March 2020

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to 15 July 2020, followed by MCO 2.0 (from 9 November 2020 to February 2021) and MCO 3.0 (from 3 May 2021 to September 2021). Overall, Malaysian school children attended in-person classes for only six months in 2020. Schools nationwide were allowed to reopen in stages, beginning from 15 July 2020, when the first stage started with Form One to Form Four and Standard Five to Standard Six students, then it continued with Standard One to Standard Four on 22 July 2020. Although the complete reopening of schools nationwide started in mid-July, students taking public examinations (SPM, STPM, STAM and SVM) and equivalent international school examinations were allowed to return to school and start their physical class on 24 June 2020 (Harun and Arumugam 2020). As Malaysia went through the third wave of infections, MOE once again announced the closure of schools nationwide starting from 9 November 2020 until 19 January 2021. Schools then reopened in phases (Nazari 2020).

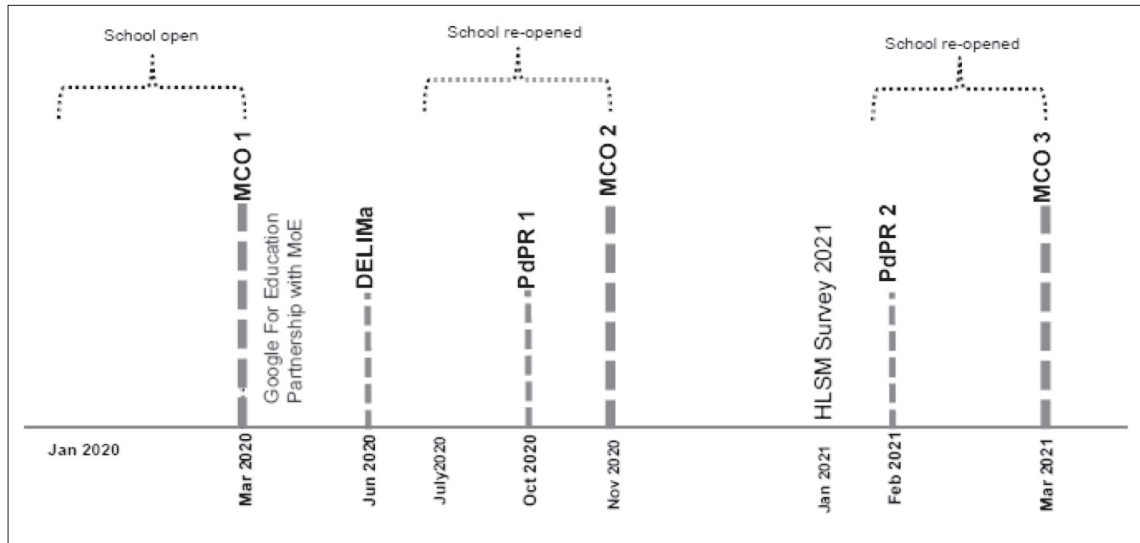
To ensure learning continuity during school closure, the government introduced home-based online learning on 18 March 2020, immediately after MCO 1.0 (Karim 2020). For this, the Ministry of Education partnered with Google For Education, along with other educational organizations, to conduct online webinars to upskill teachers for online learning to implement home-based learning, also popularly known as PdPR. More specifically, the MOE launched a Distance Learning (MoE-DL) platform that provides links to Google Classroom, Microsoft Teams, Digital Textbook, Edpuzzle (interactive teaching via video), Quizizz (game quiz) and Kahoot (game-based learning platform). ODL Videos link (i.e., EduwebTV and CikgooTube) could be accessed by all teachers, parents and students nationwide. In June 2020, the Ministry of Education formally branded its Google Classroom online learning platform as DELiMA (Digital Educational Learning Initiative Malaysia) after partnering with Microsoft, Google and Apple (Sharon 2020).<sup>3</sup> The MoE also collaborated with the Ministry of Communications and Multimedia to air daily lessons on RTM's TV Okey channel. This was partly to reach out to learners who could not access MoE's online education service, EduwebTV (Banoo 2020). In October 2020, the government launched a formal guideline for PdPR to assist teachers with implementing the scheme. This was further updated in February 2021.<sup>4</sup> Figure 1 summarizes the overall policy timeline. Since data used in this study research were collected in January 2021, the study essentially examines the first year of home-based learning.

How should we conceptualize the PdPR? To answer this question, a detailed description of the programme is necessary. Several factors are worth highlighting. First, the PdPR manual is a guideline for parents and teachers as well as a reference for MoE administrators from the district education office (PPD), state education departments (JPN) and divisions in the Ministry of Education Malaysia (KPM). Second, PdPR can be implemented online or offline or off-site.<sup>5</sup> Logistically, the programme works through a combination of three things: ODL (open and distance learning) online video links; various educational TV channels; and the DeLiMA platform for schools offering daily online lessons. The DeLiMA platform gives schoolteachers the digital tools to deliver daily online lessons. A teacher, however, may organize lessons using ODL online video links and home assignments delivered offline. Third, where the Internet is weak or unavailable, education TVs serve as an alternative. Students can use these to learn at their own pace, with or without daily online school lessons. They could also learn via television through Educational TV Programme that are aired from Monday to Friday via TV Okey, Radio Televisyen Malaysia Channel 110, MyFreeview TV (RTM), Channel 146 Astro, Astro NJOI, Tutor TV, Astro GO and DIDIKTV@NTV7.

Fourth, it is expected that, regardless of the medium of instruction, responsible school teachers would remain in regular contact with students to implement home-based learning. In sum, teachers can implement PdPR via: learning platforms such as DELiMA, Cikgootube, EduWebTV and social media applications; applications such as Google Meet or Microsoft Teams live streaming; or eGames, video, audio clips, eBooks, recordings or online assignments.

Fifth, in addition to the manual (see Appendix A), MoE regularly communicated with all responsible education bodies through professional circulars and notification letters. As per the PdPR guideline, school

FIGURE 1  
MCO, PdPR and Policy Timeline



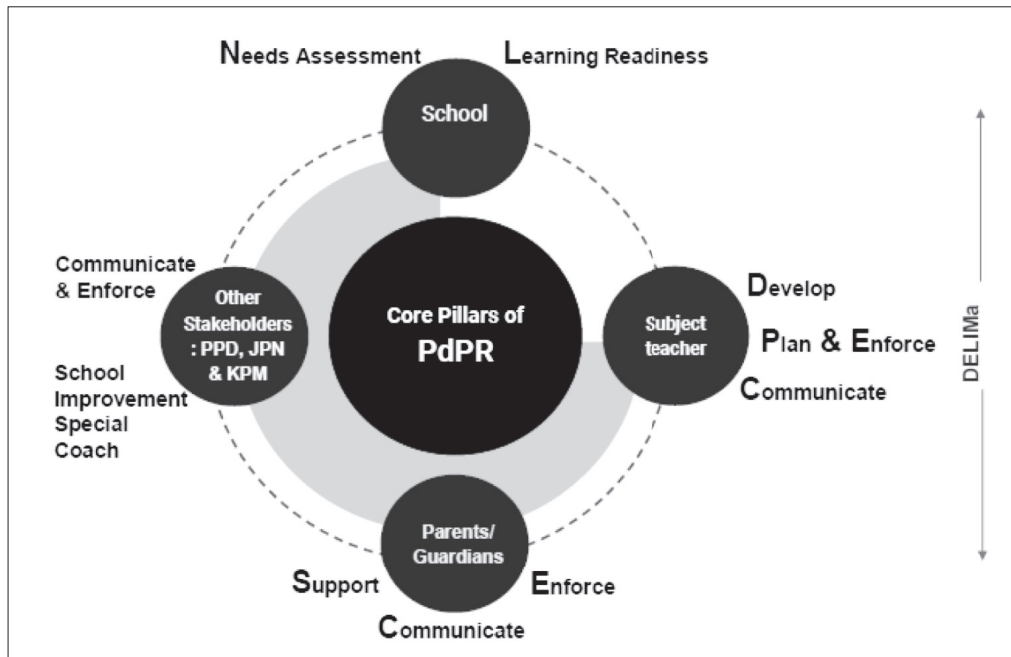
SOURCE: Author's creation.

authorities are expected to ensure that all students can follow the programme based on their needs and readiness. Equally, teachers are required to identify appropriate teaching methods (e.g., modules vs project-based learning) so that students can master the content of the prescribed subjects. Teachers are also encouraged to explore different and appropriate ways for learning continuity and increase student involvement (Figure 2).

If the PdPR scheme is implemented successfully, it can, in theory, avert major learning losses by ensuring learning continuity during school closure. In practice, despite the government guideline, there are important variations in how schools across the nation ensure home-based learning. For successful implementation, PdPR depends on effective coordination and communication involving multiple agents—principals, parents, subject teachers and MoE officials. And the nature of coordination varies depending on whether the scheme can be implemented online, offline, or off-site. At the same time, regardless of PdPR governance, home conditions are unequal, and there is also a significant divide in parental capability to support and enforce a home-learning regime. Add to these demand and supply-side educational challenges and the extra burden of economic and psychosocial distress caused by the pandemic.

Examples of specific parental capabilities include EdTech-related literacy among parents, such as familiarity with Google account registration or the ability to search for subjects in Google Classroom, browse subject materials on the DELIMA platform and YouTube, and handle Google Meet sessions for their children's online classes. Equally, the monitoring role of parents includes regularly verifying whether children attend online lessons and what they learn during PdPR lessons. In other words, PdPR requires proactive and digitally able parents and a congenial and supportive home environment. The success of the initiative also depends on at least four sets of factors: (i) effective leadership, preparation and implementation at the school level; (ii) regular online attendance of responsible/class teachers as well as their digital literacy; (iii) governance and monitoring of schools by local level education authorities; and (iv) physical provisions at home (e.g., access to the book, digital divide and the Internet) and capability of parents (e.g., digital literacy). Figure 3 summarizes this in a conceptual diagram.

FIGURE 2  
Conceptualizing PdPR



SOURCE: Author's creation.

While there is no peer-reviewed publication on PdPR, here we cite three relevant reports. A joint study by UNICEF and UNFPA on 500 low-income urban families in Klang Valley found that 76 per cent want children to attend school physically instead of online learning (UNICEF and UNFPA 2020). The most mentioned reason (47 per cent) for not preferring online education had no place to study. Poor Internet connection was also cited as a key challenge for online learning. Among other findings, 28 per cent did not have any access to devices (computer/tablet/laptop); most (87 per cent) children used cell phones for online schooling during MCO.

Similar results have been obtained by a nationwide survey conducted in May 2020 by Teach for Malaysia covering 743 students. Most students surveyed (75 per cent) preferred onsite school attendance (Tan 2020). However, the survey also provided additional important insights. About 40 per cent of students have negative feelings about online learning experiences. Students attribute part of their online learning-related grievances to conflicting class schedules and unclear class organization systems. Compared to younger students (thirteen to sixteen years), older students (seventeen to eighteen years) reported being more tired, frustrated, anxious and lost in online learning.

Given the limited evidence, there has been intense debate on the effectiveness of PdPR in popular media. Apart from the question of the unsatisfactory "quality" of online education, complaints about absentee or lazy teachers have also emerged,<sup>6</sup> During a parliament session in July 2020, the then Education Minister Radzi Jidin brought to the fore the diverse socio-economic background of learners across the country and how that may have undermined the efficacy of online learning.<sup>7</sup> The Minister also quoted an unpublished survey by the Ministry of Education conducted in April 2020 on over 670,00 parents

and 893,00 learners, which found that (i) 36.9 per cent of students do not possess or have any access to devices, (ii) only 6 per cent of students have personal computers, 5.76 per cent tablets, 9 per cent laptops and 46 per cent smartphones.

In sum, all the available evidence reviewed in this section dates back to the early months of the school closure. While this does raise questions about the effectiveness of PdPR, we do not have any systematic evidence based on data after PdPR was fully implemented. Moreover, the PdPR manual is just a guideline for parents, teachers and responsible MoE officials. The actual student experience with online schooling under the scheme depends on what the teachers decide is the best method for their students, considering students' backgrounds and circumstances and how they are governed by school principals and MoE administrators. Teachers will differ in terms of methods to deliver the lessons depending on personal and location-specific circumstances. This is yet another reason to document the heterogeneity in students' online learning experience during school closure and, in that context, examine which is the biggest challenge: implementation-related issues or challenging circumstances at home.

### 3. Data and Sample

Our data come from a purposefully designed week-long social media-based cross-sectional survey completed in January 2021. In total, a little over 7,000 secondary school students (6,961 (7,111 including non-bumiputera) were reached via Instagram. The final working sample comprised 6,823 students, all of whom belong to the majority ethnic group (bumiputera Malay). Children of Chinese and Indian ethnicity were not included. Students from all secondary grades were allowed to participate. In the final sample, 42 per cent belonged to Form 5, 25 per cent Form 4, 20 per cent Form 3 and 13 per cent Forms 1–2).

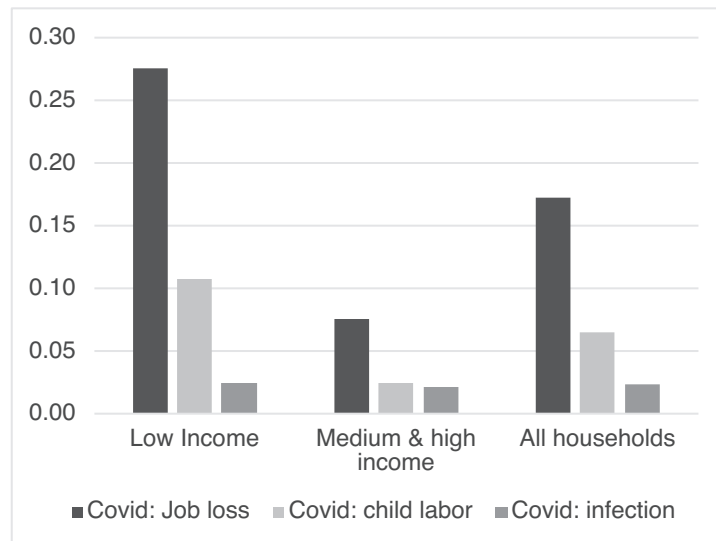
Using social media as a data collection platform for a nationwide online survey for COVID-19 research is not uncommon in the literature.<sup>8</sup> Nonetheless, the non-representative nature of the data raises valid concerns relating to systematic bias in terms of the under-representation of certain demographic groups. To assess this, we looked at the sample composition in detail. While our data are not nationally representative (3 per cent of respondents are from East Malaysia—Sabah/Sarawak), the sample is nationally spread out. It has good coverage of students from various states of Peninsular Malaysia (Johor 9 per cent, Kedah 7 per cent, Kelantan 10 per cent, Malacca 4 per cent, Negri Sembilan 4 per cent, Pahang 4.7 per cent, Penang 3.4 per cent, Perak 8.6 per cent, Terengganu 5.7 per cent, Kuala Lumpur 6.2 per cent and Selangor 31 per cent). Appendix Figure 1 plots state-wise response data against the population share of each state.

Other than the spatial distribution, the sample also over-represents female students. Otherwise, it has a broad representation of different income and social groups, particularly students from different income groups: almost half (48 per cent of the study children) belong to the bottom 40 per cent income groups (i.e., households with monthly household income below RM4,000). Among other notable characteristics, a significant portion of the sample belongs to COVID-affected households. Figure 3 reports data on sample Composition by COVID-19-related disruptions. Although 2 per cent of respondents reported having an infected member at home at the time of the survey, 17 per cent of sample children reported a fall in their family income while 6 per cent reported an increase in child lab or during the lockdown. Among children from poor households (monthly income less than RM2,000), 35 per cent reported an income loss while 12 per cent reported increased involvement of children in paid work.<sup>9</sup>

In sum, HLSMS 2021 over-represents educationally better-provided locations (i.e., Selangor and West Malaysia) and female students. Moreover, we cannot distinguish between rural and urban children. Among other limitations, teachers and parents were not interviewed directly. Children active on social media may share unobserved traits. Lastly, we did not collect data on student/teacher absenteeism. In other words, HLSMS data is subject to some limitations. But we argue that for these reasons, the data



FIGURE 3  
COVID-19 Exposure and Related Shocks



NOTES: (1) “Job loss” is based on a response to the following question: “Last year (2020), did any of your parents lose their job or stop working last year for more than 1 month?”.

(2) “Child labour” is based on the response to the following question: “Did you have to work to support your family last year?”.

(3) “COVID infection” is defined based on the following question: “Did anyone from your family (parents/brother/sister/you) get infected by COVID-19 last year?”.

(4) Income group differences in “job loss” and “child labour” are statistically significant at the 1 per cent level.

SOURCE: Author’s survey.

should give us at least a conservative assessment of home learning compared to what we would learn from a more representative survey with better coverage of poorer locations and student populations without Internet access (social media).

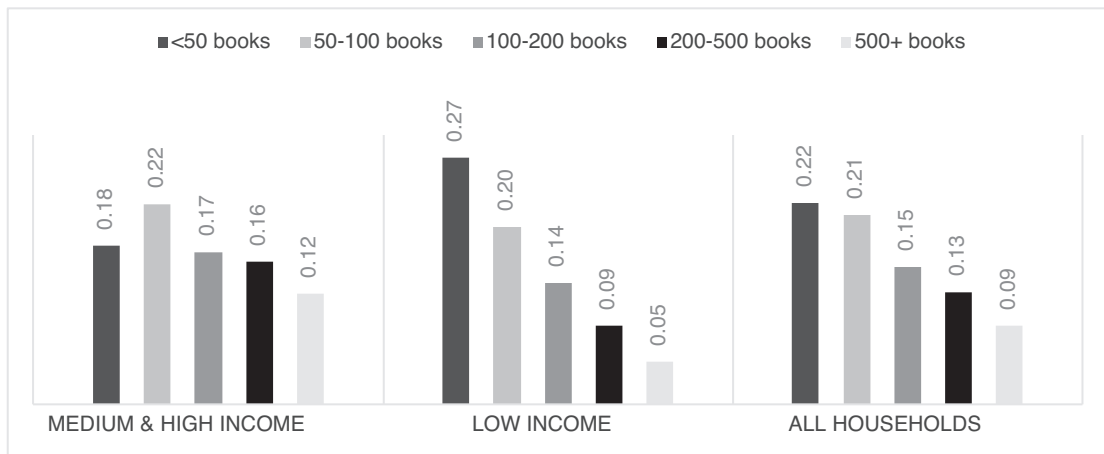
We have organized the findings into different subsections: To assess the disadvantages associated with monetary poverty, we have sliced the data by family income. The next section discusses these in detail.

## 4. Main Results

### 4.1 Socio-economic Divide in Home Environment

A widely used proxy for the learning environment at home in terms of physical inputs is the number of books (Schütz, Ursprung, and Wößmann 2008; Sieben and Lechner 2019). Figure 4 presents data on access to learning materials in terms of the availability of books. On average, 57 per cent of children reported having more than 100 books at home.<sup>10</sup> However, there is a significant difference across socio-economic groups. Low-income family students have significantly fewer books at home: 5 per cent of students from low-income families report having more than 500 books at home (12 per cent for middle/high-income families). Similar differences are also evident in the distribution of EdTech infrastructure at home.

FIGURE 4  
Number of Books at Home



NOTES: (1) The total count of books excludes e-books.

(2) All differences by income group are statistically significant at the 1 per cent level.

SOURCE: Author's survey.

Figure 5 plots data on specific EdTech provisions: availability of mobile phones, computers, laptops, tablets and a TV. In addition, we report whether the learner has at least one of the followings: computer, tablet or laptop. Around 55 per cent reported having a good Internet connection at home.<sup>11</sup> Mobile ownership was near universal (99 per cent). Laptop (83 per cent) was more common than a (desktop) computer (29 per cent) and tablet (30 per cent). TV ownership was also high (84 per cent). When computers, laptops and tablets are considered together, 89 per cent of respondents reported at least one of these devices.

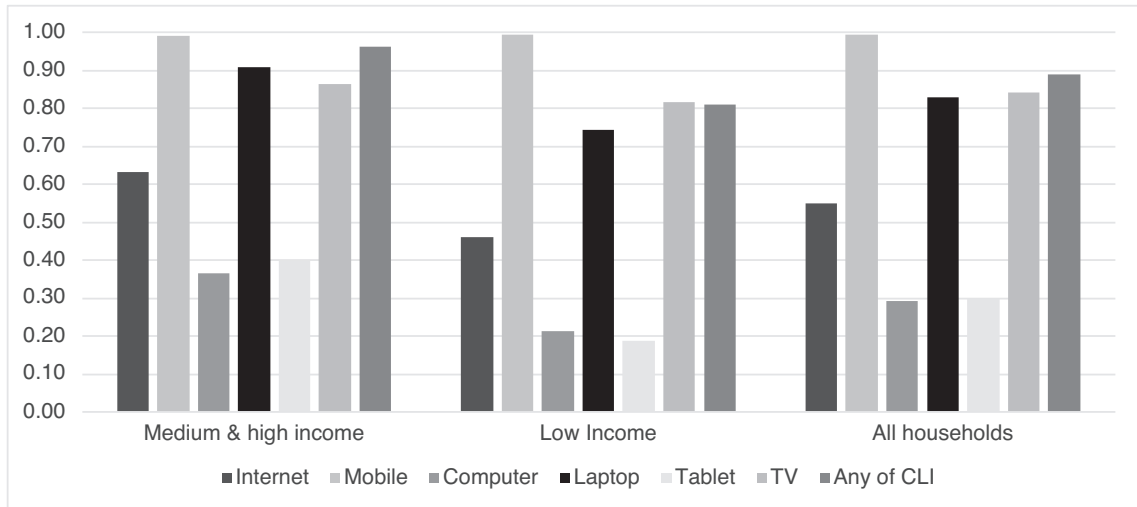
The digital divide in EdTech ownership is evident when we look at the distribution by income groups. Sample students from low-income families have lower access to the Internet and at least one computing device (computer/laptop/tablet). Only 46 per cent of low-income families report a good Internet connection at home against 63 per cent from the middle/high-income category. However, 81 per cent of low-income families report having at least one computing device at home against 96 per cent from the middle/high-income category. In other words, the rich-poor gap is less striking when we use a broader definition of access.

Yet, when it comes to the use of technology for educational purposes, regardless of income, the cell phone is the most popular choice (Figure 6). The use of any computing device is as low as 63 per cent in the low-income category. This implies that learners may be competing with others in the household for use of digital gadgets. Indeed 25 per cent of learners, regardless of income, identify this as a challenge. Another notable finding is that TV is well utilized as a learning modality compared to other developing countries (e.g., India).<sup>12</sup>

Beyond resources at home, students reported receiving limited family support (Figure 7). As high as 86 per cent reported having to “study alone”, at least for some time. Among family members who assisted, the mother is named most frequently (29 per cent), followed by siblings (28 per cent), father (21 per cent), relatives (18 per cent) and “both parents” (15 per cent). Again, there is an income divide: 35 per cent of middle/high-income students reported a supporting mother against only 23 per cent of low-

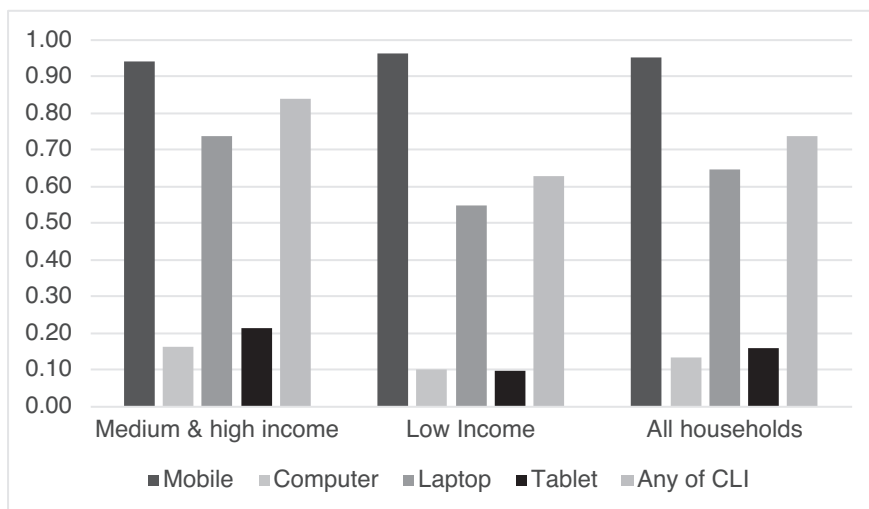


FIGURE 5  
EdTech and Digital Device Access at Home



NOTES: (1) The outcome variable is based on the response to the following question: “Which of the following facilities/devices that you have at home? (Tick all that apply)”; (2) Internet variable is based on response to the following question: “Do you have a good Internet connection at home?”; (3) All differences in technology access by income group are statistically significant at the 1 per cent level (except mobile phone availability).  
SOURCE: Author’s survey.

FIGURE 6  
EdTech Use at Home

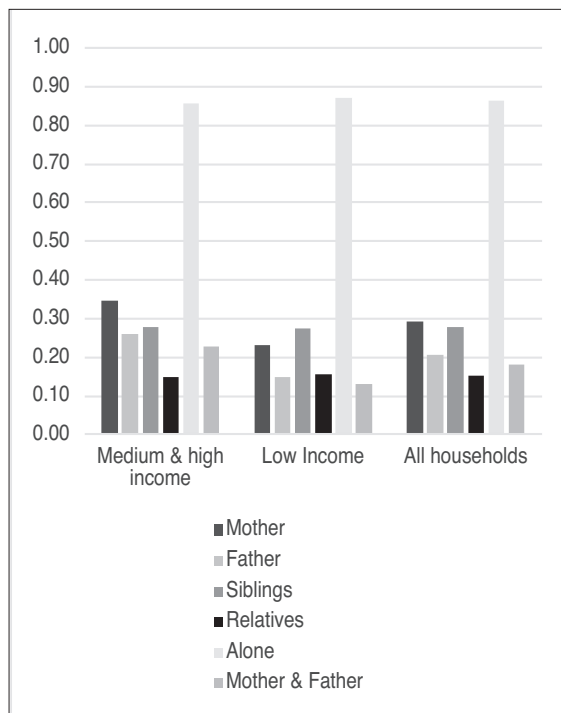


NOTES: (1) Outcome variable is based on the response to the following question: “Which devices did you use during online learning last year? (Tick all that apply)”. Since there are multiple responses, the sum does not add up to 100. (2) All differences in Ed-tech use at home by income group are statistically significant at the 1 per cent level.  
Source: Author’s survey.

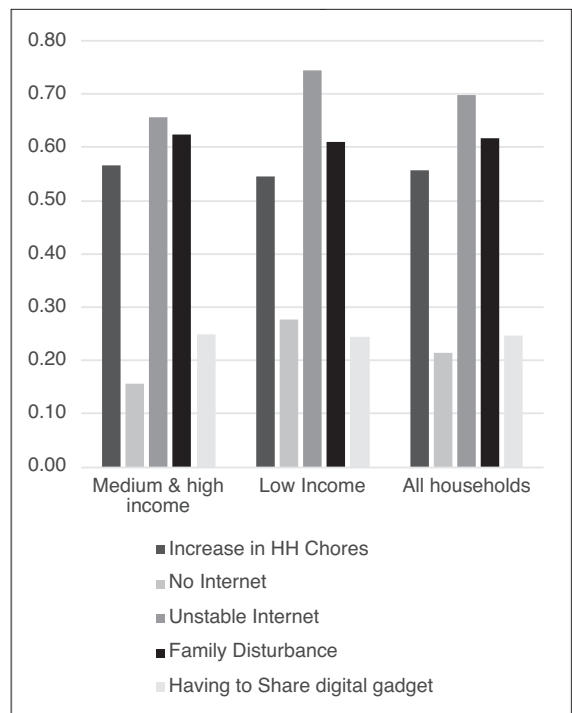
income learners. Similarly, 23 per cent of middle/high-income learners reported receiving support from both parents against only 13 per cent in the case of low-income learners. Students who received support from parents were significantly less likely to report studying alone (Appendix Table A).

Lastly, access to EdTech aside, learners faced a host of challenges at home during MCO (Figure 8); around 70 per cent reported unstable Internet as the main challenge, followed by family disturbance (62 per cent), increased household chores (56 per cent), having to share digital devices and no Internet connection (21 per cent). By income group, a significant difference is also noted in the case of lack of Internet access (28 per cent among low-income students compared to 16 per cent among middle/high-income students). However, the second commonly cited challenge is increased household chores (74 per cent among low-income students and 66 per cent among high-income students).

**FIGURE 7**  
Family Support for Home-based Learning



**FIGURE 8**  
Challenge of Home-based Learning



NOTES: (1) Figure 7 is based on the response to the following question? “Apart from teacher/tutor, which family member regularly helped you with your study during the MCO?” (multiple answers allowed). The answer option “alone” indicates whether the student report having to study alone at least on some occasion (as opposed to always receiving assistance from a family member).

(2) Figure 8 is based on response to the following question: “What are the challenges you faced with online schooling (multiple answers allowed)?”

(3) All differences in different types of “Family support for home-based learning” by income group are statistically significant at the 1 per cent level (except support from relatives and siblings).

(4) All differences in different types of “challenges for home-based learning” by income group are statistically significant at the 10 per cent level (except “family disturbance” and “having to share digital gadget”).

SOURCE: Author’s survey.

In sum, similar to the EdTech divide at home, a significant divide prevails in terms of actual access to EdTech infrastructure. Beyond access, there is also a family divide in terms of the support for home learning across income groups. There are unequal learning opportunities and support at home among bumiputera students. These gaps correlate well with family income. And considering Malaysia's high per capita income, these differences are significant.

#### *4.2 Participation in and Subjective Assessment of PdPR*

We assessed participation in two ways—in terms of the use of various technologies used for PdPR and by asking directly about the regularity of online lessons.<sup>13</sup> Figure 9 reports the different types of technology used for online education. Most students reported using various technology platforms for online learning purposes to which all teachers have access through MoE's DELIMa (Digital Educational Learning Initiative Malaysia). More specifically, Google class is the most common platform (89 per cent), followed by Telegram (85 per cent), Google Meet and WhatsApp (82 per cent), Zoom (77 per cent) and Skype (3 per cent).<sup>14</sup> There is no systematic difference between income groups. Based on the extensive use of various technology-based learning tools that are part of DELIMa, all students participated in online schooling under PdPR.

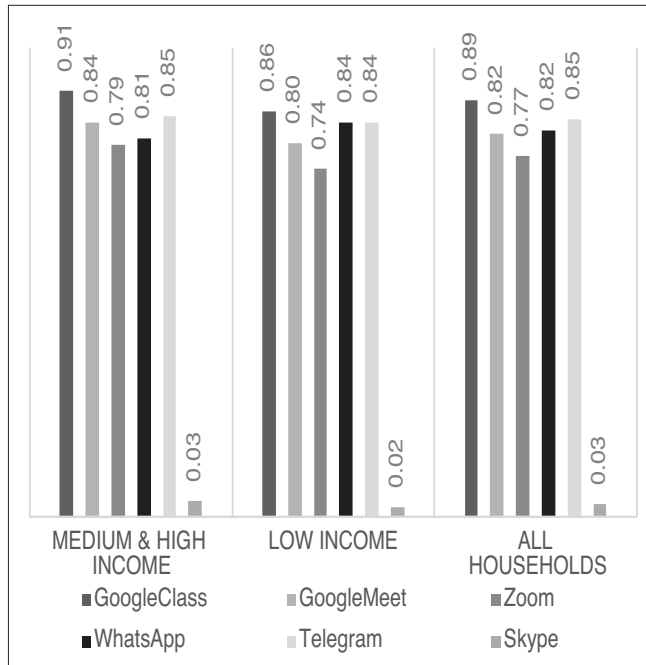
However, in terms of the actual conduct of online sessions by school authorities/teachers, there are large variations. Only 52 per cent of students reported that online classes were organized regularly by the school; 25 per cent reported irregular lessons, while the remaining 23 per cent reported no online classes at all. Although students from economically better-off households have a slightly higher exposure to regular online classes (55 per cent versus 49 per cent), even among this group, 20 per cent reported receiving no lesson at all; the remaining 24 per cent reported irregular online sessions. The irregularity may be related to poor governance and non-compliance by teachers and schools (Figure 10).

Another possibility is that students may have watched PdPR programmes on TV or online regardless of the school's online lessons. However, half of the sample students did not watch any PdPR programme regularly. Figure 11 reports the data. Among those who watched PdPR online programmes, 34 per cent did not find the quality satisfactory—they reported the programmes were not easy to follow.

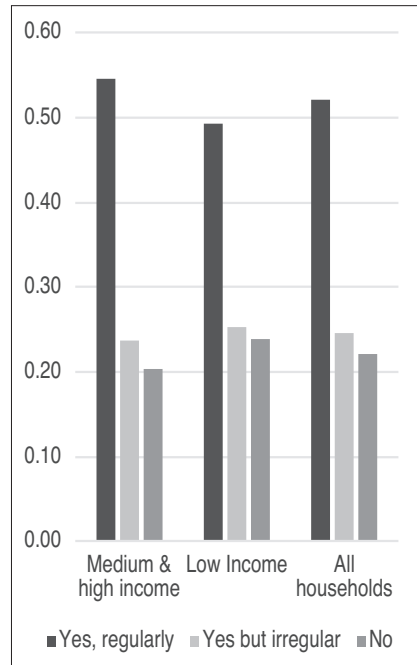
Based on the results presented so far in this section, two main findings can be highlighted: first, a large proportion of students expressed dissatisfaction with the quality of lessons available online under the PdPR scheme (Figure 12); and second, almost half of the students (47 per cent) reported not receiving regular online lessons and 22 per cent did not receive any lesson at all. We conjecture that the latter finding is likely to reflect a governance problem. But it could well reflect the design of the PdPR scheme in that teachers can implement home-schooling offline or off-site. To explore this further, Figure 13 plots data on “missing online schooling lessons” by selected SES indicators. A significantly higher proportion of students without any digital device reporting missing classes suggest that indeed teachers may be offering lessons offline to these students. However, we also find no significant correlation between missing online lessons and unstable Internet or lack of access to the Internet. Differences based on COVID-19 job loss status, the number of books at home and TV availability are not statistically significant. However, there is a strong correlation between the mother's education and location (whether in Klang Valley). This indicates that educated mothers are more likely to hold teachers accountable for missing lessons and/or monitor their children. At the same time, we found no correlation between “studying alone” and “missing online school lessons” (the Pearson correlation coefficient is zero and not reported). This implies that students unattended by family members were not those disproportionately reporting missing online lessons.

We additionally asked the student respondents about their overall experience with the shift from onsite to online schooling under PdPR following the school closure. Most learners were not happy with the switch (Figure 14). Only 18.2 per cent were happy with the switch to online education, 33.6 per cent

**FIGURE 9**  
Type of Online Communication Tools Used



**FIGURE 10**  
Regularity of Online Classes



NOTES: (1) Regularity of online classes is based on response to the following question: “Last year, did your school offer daily online classes?”.  
 (2) All differences in different types of “online communication tools used” by income group are statistically significant at the 1 per cent level (except Telegram).  
 (3) All differences in different categories of “regularity of online classes” by income group are statistically significant at the 1 per cent level (except the category “Yes but irregular”).  
 SOURCE: Author’s survey.

were unhappy and 48.2 per cent were neutral. Low-income students were relatively unhappier (36 per cent) compared to medium and middle/high-income students (31 per cent).

To understand better the related socio-economic correlates, we re-examined the data disaggregating across various socio-economic groups. As seen in Figure 15, learners who report “not happy with online schooling” are broadly spread out across different socio-economic groups. The exception includes students from Kuala Lumpur and the country’s most urbanized and economically advanced state, Selangor. Together, the two regions are popularly known as the Klang Valley. Given that this is the most prosperous and educationally advanced part of the country, dissatisfaction with online schooling under PdPR once again raises concerns about educational governance during school closure.

*4.3 Learner Attitudes towards Education and School Reopening*

Beyond PdPR, we examined the overall attitude towards education while schools remained closed, including attitudes towards online versus onsite education once schools reopen. The majority (92 per

FIGURE 11  
Did Not Use PdPR Online/TV Programmes

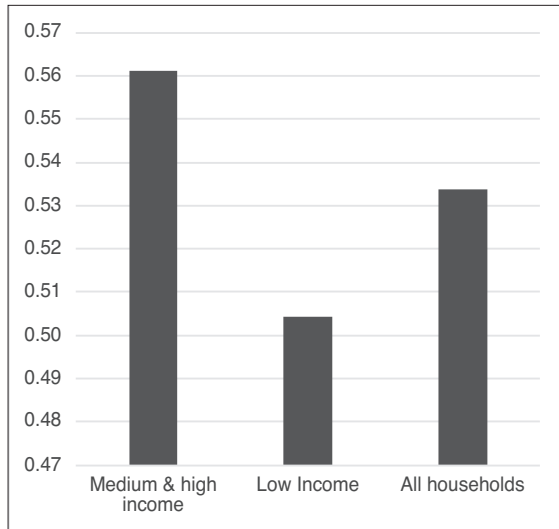
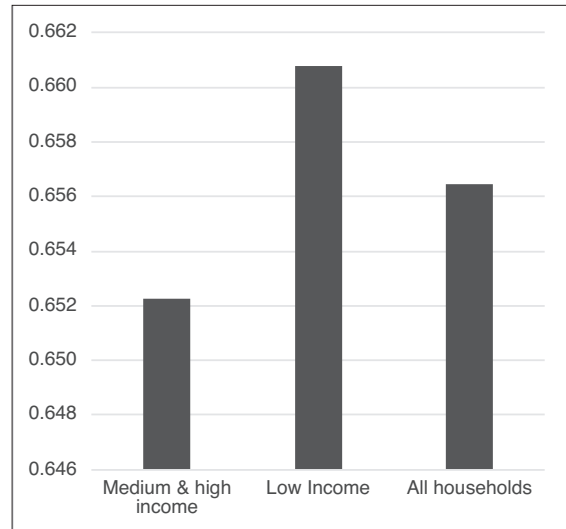


FIGURE 12  
Quality of PdPR Programmes



NOTE: (1) Figure 11 is based on the response to the following question: “Did you watch any government (distance) learning programme?”.

(2) Figure 12 is based on the response to the following question: “Did you find ... the programmes easy to follow?”.

(3) Differences in “use PdPR online/TV programmes” by income group is statistically significant at the 1 per cent level.

cent) of students reported that they have no intention of discontinuing schooling during the current school year (Figure 16). However, this also implies that 8 per cent of students are at risk of dropping out. That said, when asked about school reopening, the majority (80 per cent) responded saying that they preferred to have physical schooling, either fully onsite or blended with online lessons (Figure 17). But a sizeable proportion (20 per cent) are in favour of continuing with home-based schooling.<sup>15</sup>

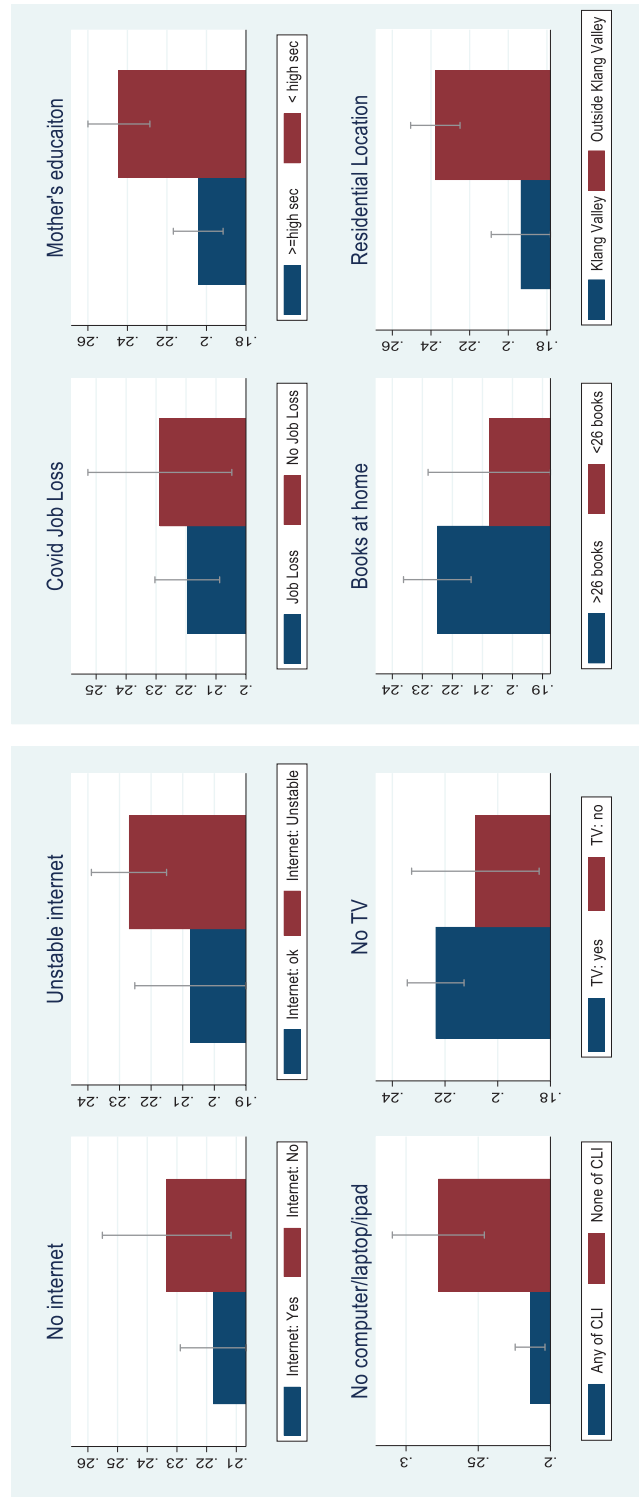
To better understand the desire to return to school, we again disaggregated the data by various SES indicators. The results are presented in Figure 18. Preference for returning to school is broad-based. While all students want to return to school regardless of home conditions, two aspects stand out: the desire is greater among students without any digital gadgets at home; and students from Malaysia’s most urbanized and advanced part—Klang Valley—are most eager to return to school.

#### 4.4 Heterogeneity by Student Gender and Region

Throughout, we have reported differences in PdPR-related indicators by household income level. This section summarizes similar differences by student gender (male versus female) and location (Klang Valley versus the rest of Malaysia). Since HLSMS 2021 does not distinguish between rural and urban locations, comparing Klang Valley with the rest of Malaysia helps in understanding regional disparity, given that the former is the most urbanized part of the country.

Table 1 reports the results alongside the *t*-test of difference. We do not see a significant gender gap in COVID-19-related shocks except that a higher proportion of boys report having worked to support

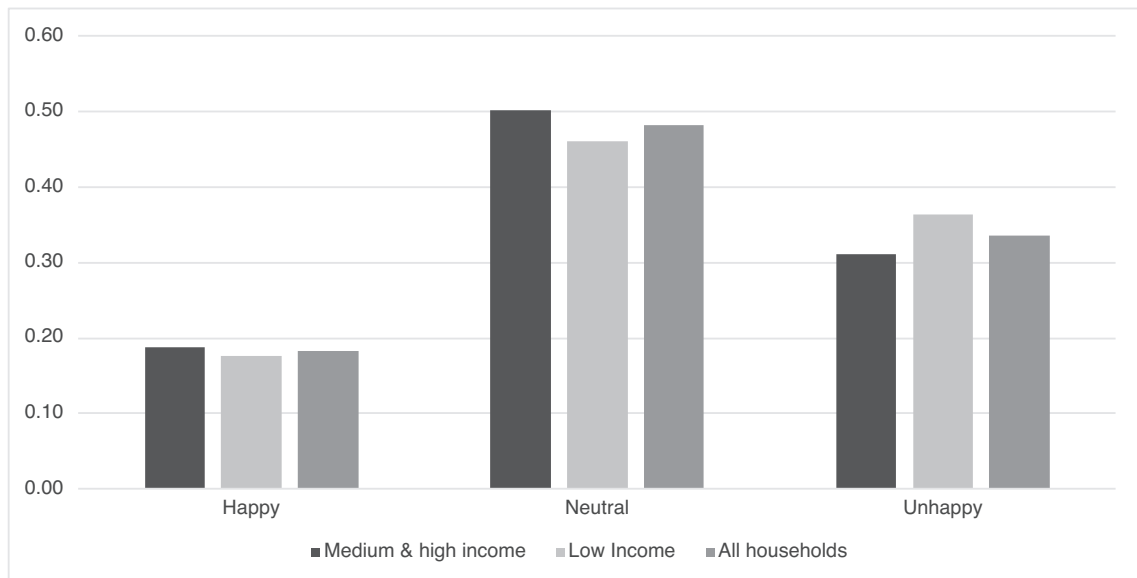
FIGURE 13  
Missing Online School Lessons by Selected Socio-economic Correlates



Notes: (1) The outcome variable—“missing online school lesson”—plotted is “proportion of students who received no online lessons from the school during the MCO”.  
 (2) 95 per cent confidence interval reported.  
 SOURCE: Author’s survey.



FIGURE 14  
Student's Assessment of Switch to Online Education



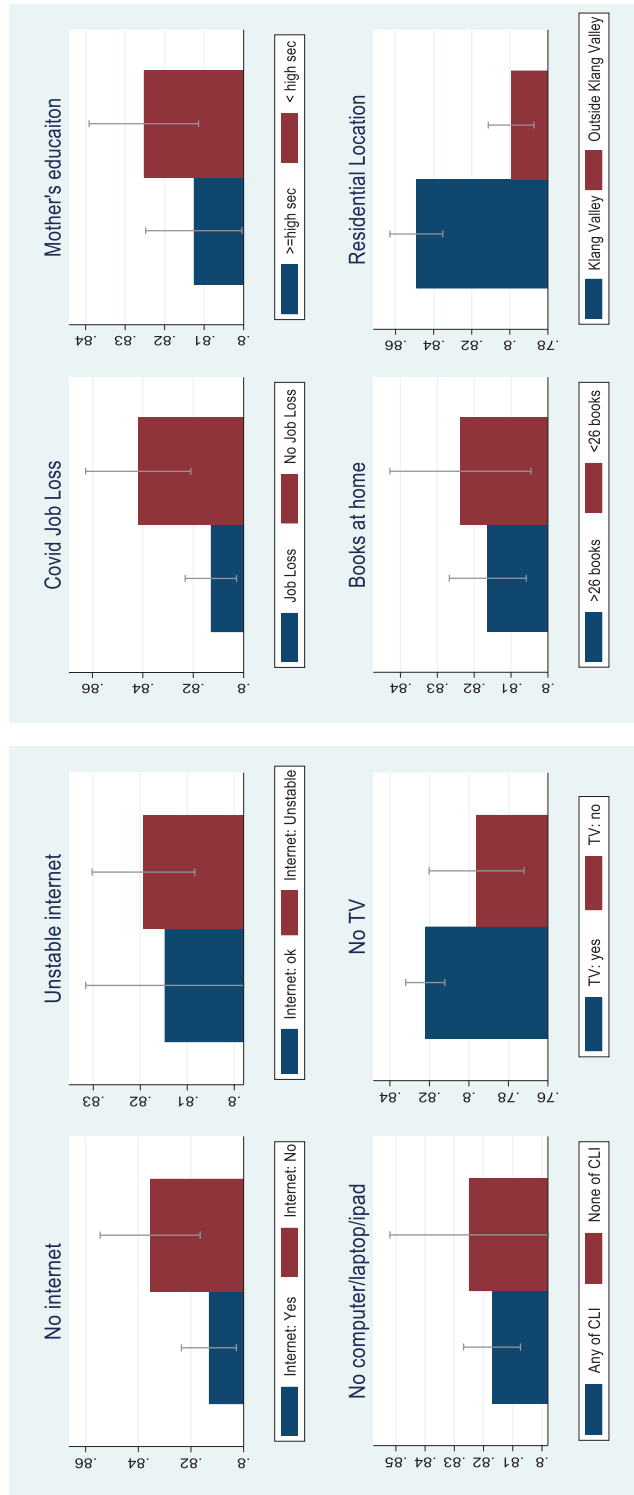
NOTES: The outcome variable is based on the response to the following question: “Teaching and learning have switched to online platforms since MCO 1.0 last year. How do you feel about this?”

SOURCE: Author’s survey.

the family during the first year of the pandemic. In terms of access to learning materials, girls report having more books at home. There is also no systematic gender gap in: (i) access to digital devices at the household level; (ii) reported usage by the specific learner; and (iii) family support for home-based learning. However, some differences are significant when it comes to challenges faced with home-based learning. For instance, a higher proportion of girls report an increase in household chores vis-à-vis boys as a challenge. In addition, more girls reported family disturbance compared to boys. But there is no gender difference in challenges related to access to or use of digital devices. We also do not find a systematic gender gap in various types of online communication tools used for PdPR. Reassuringly, the reported incidence of regular online learning sessions by teachers is identical across boys and girls. Turning to the use and subjective assessment of PdPR programmes, we notice some gender differences. Boys are more likely to have not watched any PdPR programme. They are also likely to have found the programmes difficult to follow compared to girls. Lastly, there is no gender difference in preference for school attendance in person, though girls show a significantly less preference for mixed-mode schooling compared to boys.

Turning to location-wise differences, we do not see a significant gender gap in COVID-19-related shocks. While learners from Klang Valley report a significantly higher proportion of parents suffering job loss, the difference is not large. The distribution of books at home does not vary significantly by location. However, there is a systematic regional advantage in favour of Klang Valley in: (i) access to digital devices at home; and (ii) reported usage by the learner. While a significantly higher proportion of learners from Klang Valley report using computers, laptops and tablets, those from elsewhere rely more on mobile phones. Interestingly, the latter group of learners also report receiving significantly more support

FIGURE 15  
 “Unhappiness” with Online Schooling



Notes: 95 per cent confidence interval reported. Unhappiness is defined as either “not happy” or “neutral”.  
 SOURCE: Author’s survey.

FIGURE 16  
Intention to Continue Education

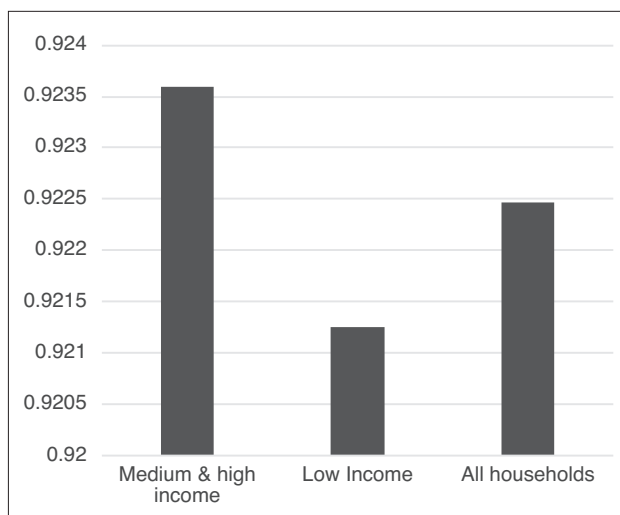
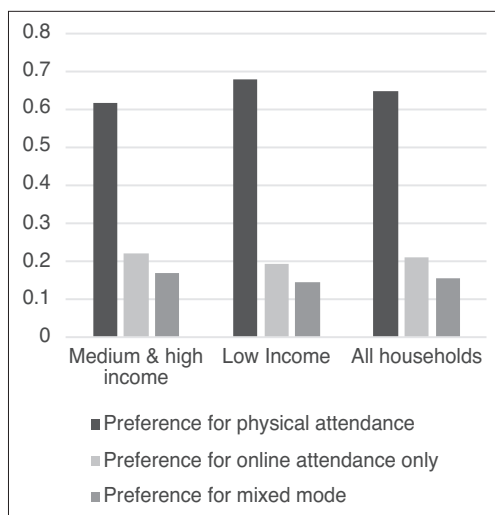


FIGURE 17  
Preference for Returning to Onsite Schooling

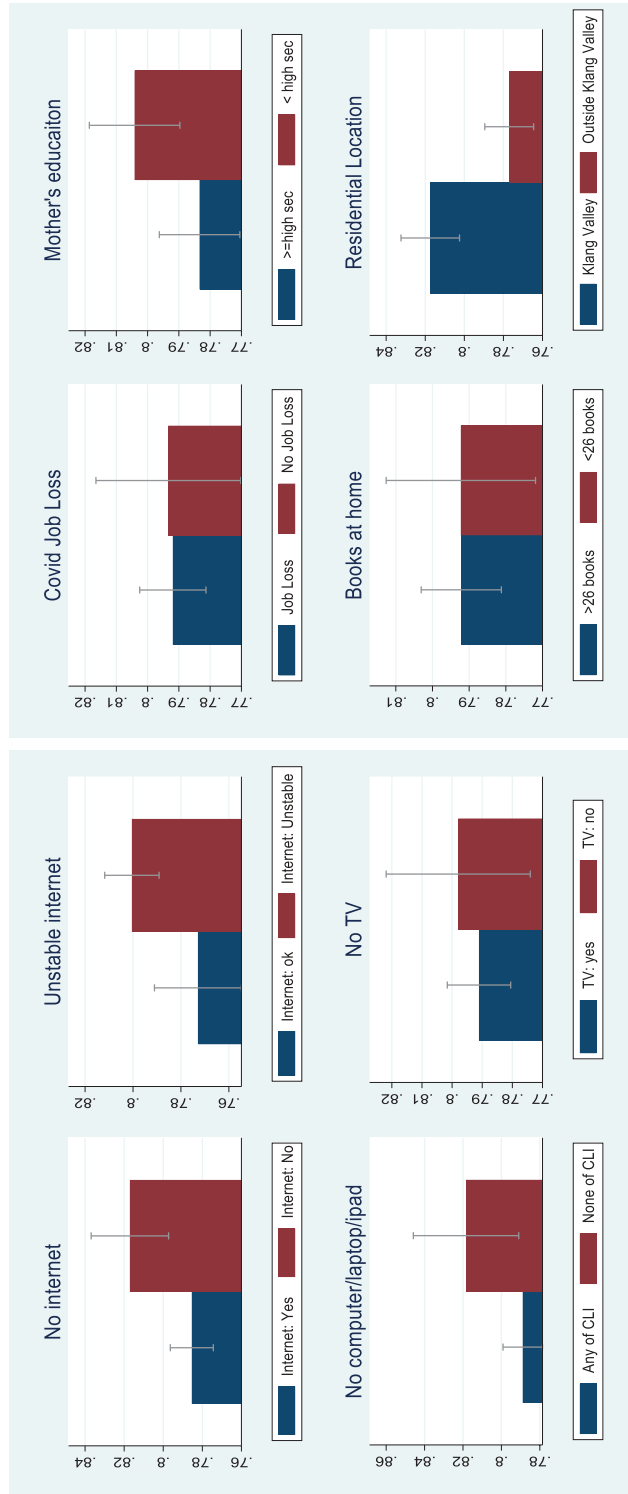


NOTES: Figure 16 is based on the answer to the following question: “Do you plan to continue your school education this year (i.e., 2021)”. Figure 17 is based on the answer to the following question: “If school reopens this year, will you attend classes physically or prefer online lessons?”.

SOURCE: Author’s survey.

from family members suggesting that urban parents are more time constrained to assist children with PdPR. Moreover, students from Klang Valley are also significantly more likely to report the incidence of increased child labour and family disturbance as challenges of online learning. On the other hand, those from outside the Valley report significantly more frequent EdTech-related challenges such as unstable Internet at home. We also note major regional differences in the type of online communication tools used for homeschooling purposes. WhatsApp and Telegram are significantly more common among learners outside Klang Valley, while Zoom and Google Meet dominate in Klang Valley. The reported incidence of online learning sessions by teachers is also significantly different by location: students from outside the Valley not only reportedly experienced fewer regular sessions, but a larger proportion also reported not having any online lessons. The latter could be driven by digitally excluded locations where PdPR could be implemented only in offline mode. Turning to the use and subjective assessment of PdPR programmes, we find some important differences. A significantly larger proportion of students from Klang Valley (56 per cent) did not use/watch any PdPR online/TV programmes compared to 48 per cent outside Klang Valley. Lastly, there is no location-specific difference in aspirations to continue education, though learners in Klang Valley show a significantly greater preference for mixed-mode schooling.

FIGURE 18  
Preference for “Returning to Onsite Schooling”



NOTES: 95 per cent confidence interval reported. The outcome variable is “proportion of students who say that they prefer to have physical schooling, either fully onsite or blended with online lessons”.

SOURCE: Author’s survey.

TABLE 1  
Gender and Regional Differences in Key Measures and Indicators

<i>Indicators</i>	<i>Male</i>	<i>Female</i>	<i>(t-test)</i>	<i>In</i>	<i>Outside</i>	<i>(t-test)</i>
				<i>Klang Valley</i>	<i>Klang Valley</i>	
COVID-19 exposure & related shocks						
<i>Job loss by parents</i>	0.18	0.17		0.18	0.17	**
<i>Child labour by the learner</i>	0.09	0.06	*	0.06	0.07	
<i>COVID-19 Infection of family member</i>	0.02	0.02		0.02	0.02	
Number of books at home						
<26	0.08	0.04	*	0.05	0.05	
26–50	0.23	0.22		0.22	0.22	
51–100	0.20	0.21		0.22	0.21	
101–200	0.12	0.16	*	0.15	0.16	
201–500	0.08	0.14	*	0.11	0.13	**
>500	0.07	0.09	*	0.08	0.09	
Access to Ed-tech/digital devices at home						
<i>TV</i>	0.81	0.85	*	0.84	0.84	
<i>Mobile</i>	0.99	0.99		0.99	0.99	
<i>Computer</i>	0.34	0.28	*	0.32	0.28	*
<i>Laptop</i>	0.80	0.83	*	0.86	0.81	*
<i>Tablet</i>	0.30	0.30		0.33	0.28	*
<i>Any of CLI (computer, laptop or tablet)</i>	0.88	0.89		0.92	0.87	*
Ed-tech use at home						
<i>Mobile</i>	0.94	0.96	*	0.93	0.96	*
<i>Computer</i>	0.18	0.12	*	0.14	0.13	***
<i>Laptop</i>	0.62	0.66	*	0.69	0.62	*
<i>Tablet (&amp; I-pad)</i>	0.15	0.16		0.18	0.15	*
<i>Any of CLI (computer, laptop or tablet)</i>	0.73	0.74		0.79	0.71	*
Family support for home-based learning						
<i>Mother</i>	0.30	0.29		0.27	0.31	*
<i>Father</i>	0.22	0.20		0.19	0.22	*
<i>Siblings</i>	0.25	0.28	*	0.24	0.30	*
<i>Relatives</i>	0.15	0.15		0.14	0.16	
<i>Study alone</i>	0.82	0.87	*	0.87	0.86	
<i>Both parents</i>	0.19	0.17		0.16	0.19	*
Challenges of home-based learning						
<i>Increase in HH chores</i>	0.46	0.58	*	0.58	0.54	*
<i>No Internet at home</i>	0.20	0.22	**	0.17	0.24	*
<i>Unstable Internet</i>	0.69	0.70		0.66	0.72	*
<i>Family disturbance</i>	0.54	0.64	*	0.66	0.59	*
<i>Having to share a digital gadget</i>	0.23	0.25		0.26	0.24	*
Type of online communication tools used						
<i>WhatsApp</i>	0.78	0.83	*	0.80	0.83	*
<i>Zoom</i>	0.74	0.78	*	0.79	0.76	*

<i>Google Class</i>	0.93	0.95	***	0.96	0.93	*
<i>Google Meet</i>	0.87	0.89	**	0.92	0.87	*
<i>Skype</i>	0.04	0.03	**	0.03	0.02	**
<i>Telegram</i>	0.81	0.86	*	0.79	0.88	*
Regularity of online classes						
<i>Yes regularly</i>	0.51	0.52		0.56	0.50	*
<i>Yes but irregular</i>	0.26	0.24	***	0.24	0.25	
<i>No</i>	0.21	0.22		0.19	0.24	*
Use and quality of PdPR programmes						
<i>Did not use PdPR online/TV programmes</i>	0.57	0.49	*	0.56	0.48	*
<i>Quality of PdPR programmes (easy to follow)</i>	0.57	0.68	*	0.61	0.68	*
Student's assessment of switch to online education						
<i>Happy</i>	0.19	0.18		0.15	0.20	*
<i>Neutral</i>	0.46	0.49	***	0.51	0.47	*
<i>Unhappy</i>	0.35	0.33		0.34	0.33	
Aspirations and preferences for schooling						
Intention to continue in education	0.92	0.92		0.92	0.92	
Preference for return to onsite schooling						
<i>Preference for physical attendance</i>	0.66	0.64		0.65	0.64	
<i>Preference for online attendance only</i>	0.17	0.22	*	0.18	0.22	*
<i>Preference for mixed mode</i>	0.11	0.09	**	0.11	0.09	*

NOTES: (1) t-statistics corresponds to two-tailed tests. (2) \*, \*\* and \*\*\* indicate significance at the 1 per cent, 5 per cent and 10 per cent levels, respectively.

SOURCE: HLSMS 2021.

## 5. Discussion and Policy Implications

Our results are consistent with the emerging academic evidence evaluating the government's distance learning programmes in at least three aspects. First, similar to developing country evidence that found that students from higher-educated and socio-economically better-off families are more likely to experience remote schooling (e.g., Hossain 2021), we also find evidence that a higher proportion of students from low-income households and those with less educated mothers report receiving no online lessons. Second, our finding that Malaysian learners favour regular classes, and a significant proportion are dissatisfied with online learning is consistent with existing developing country studies reporting negative feedback from students relating to remote learning during school closure (e.g., Selvaraj et al. 2021) and existing non-academic literature on Malaysia (e.g., UNICEF and UNFPA 2020). Third, our finding of the divide in EdTech access and usage is consistent with the available developing country evidence on the divide in the effective use of learning technology (e.g., Cappelle et al. 2021).

The findings presented in this study also have important policy implications, given the launch of several policy documents and plans. They also confirm some of the existing concerns of the Government of Malaysia over PdPR and the inadequacy of past measures. For instance, Malaysia's Penjana National Economic Recovery Plan supported various state-business joint initiatives to improve access to online education services delivered under the PdPR scheme.<sup>16</sup> This also encouraged some private Internet providers to launch additional support services. In addition, immediately after the first school closure, free Internet was offered to customers of all Malaysian telecommunication operators at RM600 million. Furthermore, an additional sum of RM400 million was invested in widening network coverage and



capacity, maintaining stable, high quality and availability of telecommunication services.<sup>17</sup> This ensured access to a range of education and productivity-related services considered critical for the successful implementation of the PdPR scheme. However, these measures have not been adequate.

The latest five-year plan for the period 2021–25 has emphasized improving access to quality and affordable education (“Supporting the M40 towards Equitable Society”) as one of the key strategies to develop the youths. At the same time, the Twelfth Malaysia Plan (12MP)<sup>18</sup> has also acknowledged new challenges created by the pandemic as well as the digital and social divides:

Due to the COVID-19 pandemic, students in schools, HEIs and TVET institutions have to undergo online teaching and learning. This caused problems for students with limited Internet access, especially those who live in rural and remote areas or from low-income families. Teachers and instructors in rural areas also face the challenge of ensuring that online teaching and learning sessions run smoothly. This has further hampered efforts in providing quality education in Sabah and Sarawak (12MP).

In this context, our findings are relevant as the first independent assessment of PdPR, particularly given the call for an evidence-based 12MP policy for post-pandemic educational recovery. The Annual Budget for the fiscal year 2022 has also retained the single focus on investment in physical inputs (e.g., laptops, school facilities and buildings) in low-income schools and communities (including the majority of bumiputera).<sup>19</sup> Our findings on the digital divide by income groups in the bumiputera community provide some justification for these measures. Likewise, recent budgetary provisions to improve EdTech access can be justified given our findings related to equity. There are unequal opportunities for using devices available at home for learning purposes. One measure in Budget 2022 is targeted at the bumiputera community whereby the higher learning institutions (IPT) students from B40 families will receive a free tablet through the *Peranti Siswa Keluarga Malaysia* initiative.<sup>20</sup> To this end, the government has allocated RM450 million. In addition, there is a special tax relief of up to RM2,500 for the purchase of mobile phones, computers and tablets until 21 December 2022.<sup>21</sup>

That said, our findings also highlighted two important gaps in recent policy documents in Malaysia. First is the lack of recognition of the inequality in familial support in terms of assistance for home study. Alongside teachers, day-to-day operations of home learning also depend on the effective monitoring of students by parents and family members. Yet, the sudden shift of lessons to home settings has globally left parents with little time to prepare for their new supporting role (UNESCO, UNICEF, and World Bank 2020). This is likely to be a serious challenge for low-income bumiputera parents. PdPR 1.0 lacked adequate parental guidance to assist children with home-based learning. While PdPR 2.0 has added some new instructions to aid parents in their new role, there are no clear provisions to build parental capability.

Second is the need to look into the potential governance deficit in the delivery of PdPR in terms of better online monitoring of teachers and learners by school authorities. Based on student reports, not only has online schooling been irregular, but it also did not prove popular among learners, including those who had received the lessons regularly. This evidence suggests gaps in governance and compliance by school authorities for online lesson provision. But the lack of parental capability could be an additional contributory factor. The school principals are responsible for the learning needs assessment of their students, coordinating daily lesson plans (e.g., whether to pool lessons across classes in a given grade for a subject) and monitoring teachers. In contrast, subject teachers are in charge of enforcing lesson plans and communicating with students and teachers. Parents, on the other hand, are supposed to report back to teachers any difficulty and coordinate offline lessons by visiting the school and collecting learning materials from teachers. In the first year of the pandemic (i.e., under PdPR 1.0), the Ministry of Education had no mechanism to track student attendance and teacher activities in real time. So differential, need-

based teaching could not be ensured. In the absence of a centralized mechanism for attendance monitoring under PdPR 1.0, regular monitoring of schools by local authorities remained another challenge.<sup>22</sup>

Lastly, our findings are relevant to the new social sciences literature on EdTech. This literature has focused on four areas: access to technology; effectiveness of CAL; technology-enabled behavioural interventions in education; and effectiveness of online learning (Escueta et al. 2020).<sup>23</sup> Available positive evidence of technology is mostly based on supplemental funding for technology or additional class time. The emerging body of evidence (including causal studies) confirms the little impact of providing hardware alone on learning outcomes. Considering this consensus in the literature, remedial policy response for COVID-19 educational recovery need to look beyond closing the digital divide.

## 6. Conclusion

COVID-19 has caused the most extended school shutdown all over the world, forcing education to shift from offline to online mode in home settings. In this context, this study focused on three aspects: first, home conditions and provisions in terms of learning materials, technology access and use, in order to assess the preparedness of Malaysian households to support PdPR, and whether the disadvantage is associated with poverty; second, what is the nature of participation in online schooling and the extent of use of PdPR programme; and third, how did the learners evaluate PdPR? What is the attitude towards school reopening?

There are three main takeaways from this study. First, there are unequal learning opportunities at home, not just in terms of availability of and access to resources, but also in terms of support from family members. This is not unexpected given the disruptions to family circumstances due to the pandemic, including job and income losses. Second, online schooling session has been irregular and not so popular among learners. Third, the preference for returning to school is strong among learners. This is unsurprising given the less than universal coverage of online schooling, lack of popularity among Malaysian (bumiputera) learners, the difficulty in following online programmes and unequal learning opportunities at home.<sup>24</sup> Overall, these patterns are consistent with popular perceptions of PdPR and evidence from other parts of developing Asia.

But how should we interpret the data on broad-based dissatisfaction over online schooling and the extent of regular online sessions organized by schools? We have shown that these do not correlate well with Internet provisions. Of all the correlates considered, one that stood out is location. Even among students from Klang Valley, 18 per cent report not receiving any schooling session and learners are also more eager to return to a physical school. This implies that, while demand-side constraints remain relevant and important, there was also a possible governance failure during PdPR 1 (e.g., lack of effective real-time monitoring of student attendance and teacher activities). At the same time, this could be partly explained by the flexibility and discretion teachers enjoyed under the PdPR guideline. According to the official directive, PdPR can be also implemented offline or off-site, particularly in locations with poor Internet access or under-provided communities with limited digital gadgets at home. We could not formally investigate these possibilities in the absence of school-level data, and we have left this for future research.

## Acknowledgements

This paper was prepared for presentation at the ADBI-ADB-ISEAS Conference on “Improving the Quality of Basic Education in Southeast Asia” held on 15–17 September 2021. I am grateful to the participants and anonymous referees for their useful comments. I am especially thankful to Aina Adleen and Uzairi Taib for their help with data collection.

## APPENDIXES

### APPENDIX A

#### *Summary Note on the Official Guideline for PdPR*

The Ministry of Education Malaysia has prepared a comprehensive Guide to facilitate Teaching and Learning at home version 2 (PDPR 2.0). To this end, a “Home Teaching and Learning Manual Version 2” was developed as an improvement on the “Home Teaching and Learning Manual” released on 2 October 2020. This Manual was developed to assist teachers to implement PdPR as a learning alternative to new norms. This manual is also expected to serve as a reference for school administrators, officers of the District Education Office (PPD) and the State Education Department (JPN), as well as Divisions in the Ministry of Education Malaysia (KPM). It should be read in conjunction with the professional circular letter, release letter, notification letter and relevant MOE guidelines currently in force. Schools are required to ensure that all students can follow the PdPR based on their needs and readiness. Equally, teachers need to identify appropriate PdPR methods so that students be able to master the content of the prescribed subjects. Teachers should also explore different and appropriate ways for continuity and increase student involvement in PdPR. Among the PdPR methods that can be used are learning using modules and project-based learning. Below we reproduce some key instructions for schools, teachers and parents in the PdPR guideline.

- 11.1. Learning modules need to be planned in a structured manner to meet the needs of the subject and implemented within the appropriate period.
- 11.2. The learning module developed should contain the following:
  - 11.2.1. Target students (preschool, primary, secondary).
  - 11.2.2. Module title or theme.
  - 11.2.3. Learning objectives based on the Curriculum and Assessment Standard Document (DSKP).
  - 11.2.4. Activity implementation period.
  - 11.2.5. Description related to the implementation of the activity.
  - 11.2.6. Structured notes related to the module title.
  - 11.2.7. Activities relevant to the topic of PdP (examples).
  - 11.2.8. Assessment to measure student mastery.
- 11.3. This learning module is distributed to students based on the Daily Teaching Plan (RPH) set.
- 11.4. Students need to submit the results of the assignment for review/assessment and get feedback from the teacher before receiving the next learning module.
- 11.5. Project-based Home Teaching and Learning (PdPR) is implemented according to subjects or a combination of several subjects. The implementation is as follows:
  - 11.5.1. Give a title to the student.
  - 11.5.2. Guide students to identify methods of completing a given project.
  - 11.5.3. Guide students to identify the materials, equipment and costs needed.
  - 11.5.4. Determine the time frame to complete the project.
  - 11.5.5. Guide students to complete projects.
  - 11.5.6. Present the results of the project.
  - 11.5.7. Make a reflection on the project revenue process.
- 11.6. Teachers can also implement other PdPR methods such as flipped classroom, inquiry-based learning, mastery learning, contextual learning and problem-solving learning.

#### *Subject Teachers*

- 6.3.1 Determine the content of the curriculum to be implemented based on the PdPR timetable.
- 6.3.2 Provide PdP materials and tutorials that are appropriate in the time allocation set in the PdPR timetable and can be re-accessed by students.
- 6.3.3 Implement PdPR based on the set time schedule.
- 6.3.4 Administer PBD in parallel with the implementation of PdP and tutorials implemented.
- 6.3.5 Networking with parents/guardians or students in implementing the PdPR timetable.
- 6.3.6 Inform parents/guardians and students in the event of any schedule changes.

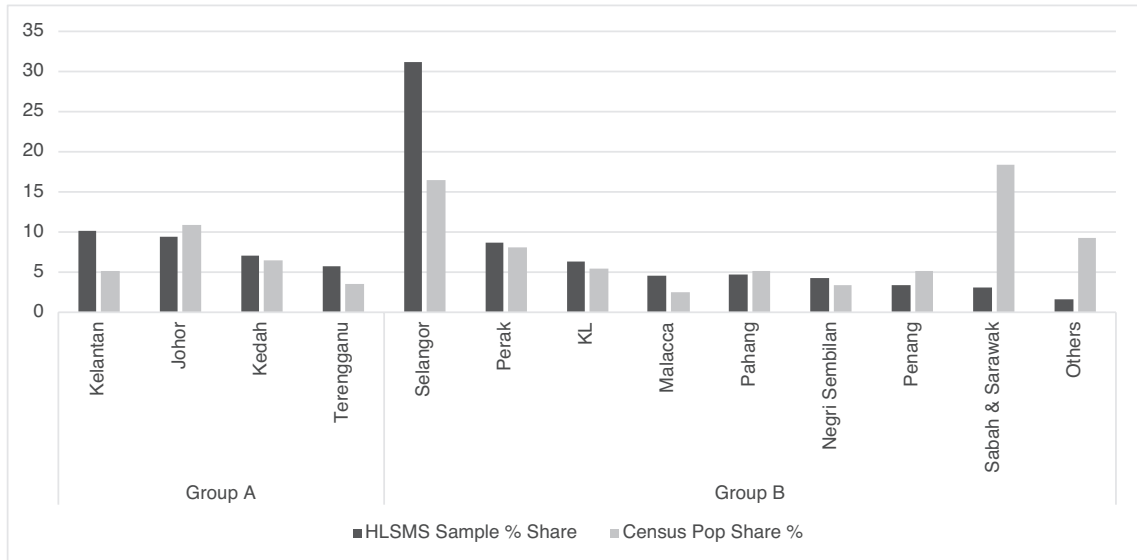
#### *Parents/ Guardians*

- 6.4.1 Ensure that the child/ ward receives the PdPR Timetable provided by the school.
- 6.4.2 Ensure that the child/ward follows the PdPR based on the set time schedule.

- 6.4.3 Communicate with the school to support the learning of the child/ward.
- 6.4.4 Provide support in helping the child/ward to learn.

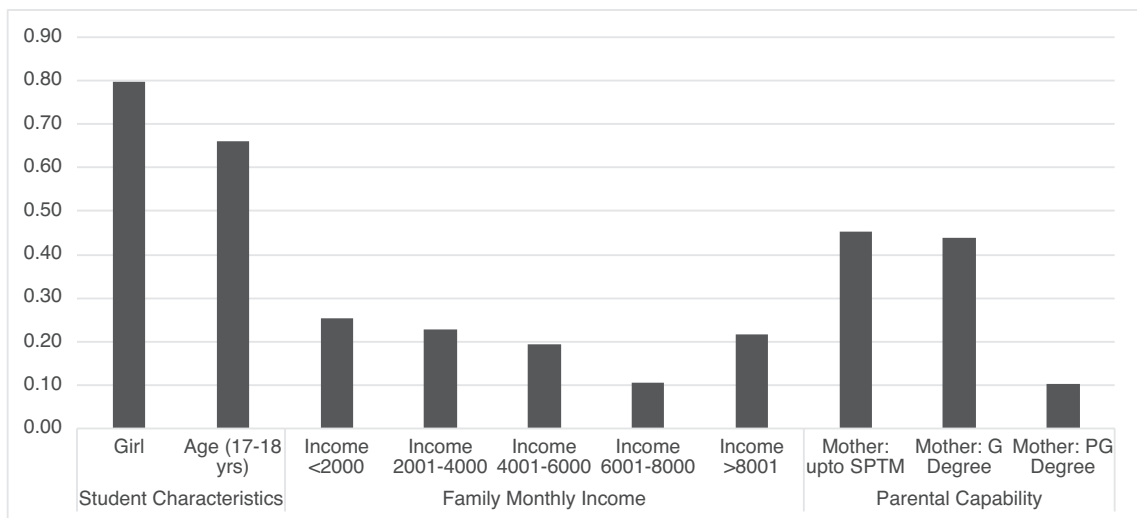
NOTE: Appendix A is a reproduction (translation) of the official guideline on PdPR 2.0 as available from <https://www.pendidik2u.my/pengajaran-dan-pembelajaran-di-rumah-pdpr-2-0/> (accessed 30 October 2021).

APPENDIX FIGURE 1  
Sample Composition: HLSMS 2021 versus Census 2010



NOTES: Population census data is from the Department of Statistics Malaysia. The grouping of states is based on the government’s circular on school reopening dates. At the time of conducting this study, the proposed new session was to start between 13 June and 15 July for Group A schools (i.e. those in Johor, Kedah, Kelantan and Terengganu), and between 14 June and 16 July for Group B schools (i.e., those in Perlis, Penang, Perak, Selangor, Negeri Sembilan, Melaka, Pahang, Sabah, Sarawak, Kuala Lumpur, Labuan and Putrajaya).

APPENDIX FIGURE 2  
Sample Composition by Demographic and Family Characteristics



APPENDIX TABLE A  
Pearson's Correlation Coefficient Matrix: Family Support for Home Study

	<i>Mother</i>	<i>Father</i>	<i>Sibling</i>	<i>Relative</i>	<i>Alone</i>	<i>Both Parents</i>
<i>Mother</i>	1					
<i>Father</i>	0.64 (0.00)	1				
<i>Sibling</i>	0.24 (0.00)	0.23 (0.00)	1			
<i>Relative</i>	0.12 (0.00)	0.12 (0.00)	0.10 (0.00)	1		
<i>Alone</i>	-0.27 (0.00)	-0.22 (0.00)	-0.27 (0.00)	-0.07 (0.00)	1	
<i>Both Parents</i>	0.73 (0.00)	0.91 (0.00)	0.24 (0.00)	0.13 (0.00)	-0.22 (0.00)	1

NOTE: p-values in parentheses.

SOURCE: Author's survey.

#### NOTES

- <https://www.moe.gov.my/muat-turun/lain-lain/manual-pdp-di-rumah/3727-manual-pdpdr/file>
- "Teks Ucapan: Pelan Jana Semula Ekonomi Negara (PENJANA)", 11 August 2020, <https://www.pmo.gov.my/2020/06/teks-ucapan-pelan-jana-semula-ekonomi-negara-penjana/> (accessed 11 January 2021).
- DELIMA was originally launched in July 2019 as new digital learning platform to enhance digital learning in schools. However, this was used further rebranded during the pandemic to ensure continuous access to learning during the pandemic. According to the 12MP document, 98 per cent of teachers used DELIMA by end of 2020.
- <https://www.pendidik2u.my/pengajaran-dan-pembelajaran-di-rumah-pdpr-2-0/>
- <https://www.moe.gov.my/muat-turun/lain-lain/manual-pdp-di-rumah/3727-manual-pdpdr/file>
- <https://www.malaymail.com/news/malaysia/2021/06/06/students-cant-return-to-school-next-week-to-still-undergo-pdpr-for-25-days/1979970>
- <https://www.malaymail.com/news/malaysia/2020/07/16/education-ministry-over-one-in-three-students-couldnt-access-online-learnin/1885005>
- For other COVID-19-related research following similar survey approaches, see Ali et al. (2020).
- The corresponding figures were only 5 per cent and 1.6 per cent in households with monthly income above RM8,000.
- Compared to other Asian countries, an average fifteen-year-old Malaysian student has more books at home than a student in Vietnam but fewer compared to a student from South Korea and Singapore. In PISA 2012 data, 25.4 per cent Malaysian students reported having more than 100 books at home (Asadullah et al. 2020).
- We only have a subjective measure of the goodness of Internet access; HLSMS 2021 has no technical details on the quality of Internet connection.
- For evidence on India, see Cappelle et al. (2021).
- "Irregularity" here refers to students missing classes because of school teachers not organizing online sessions. We did not collect data on student absenteeism.
- The popularity of WhatsApp and Telegram is partly explained by the fact that they do not require high Internet speeds or large volumes of data. Therefore, they are the most viable options for students and teachers for remotely learning lessons with a slow Internet connection.
- More specifically, 66.4 per cent said that they wish to attend school physically while 9.5 per cent preferred a combination of physical and online; 15 per cent said they do not want physical attendance while another 4.5 per cent said that they preferred to continue online (i.e. 19.5 per cent prefer a non-physical setting).



16. "Teks Ucapan: Pelan Jana Semula Ekonomi Negara (PENJANA)".
17. Prominent telecommunications operators also provided free Internet services to all Malaysian students. Students were given a free 1 gigabyte (GB) of Internet usage daily between 8 a.m. to 6 p.m. Besides, students had this access until 31 December 2020.
18. <https://www.thestar.com.my/news/nation/2021/09/28/education-sector-calls-for-more-funding-and-autonomy>
19. <https://www.thestar.com.my/news/nation/2021/10/30/huge-boost-for-education>
20. [https://www.mcmc.gov.my/skmmgovmy/media/General/pdf2/FAQ\\_ENG\\_PERANTI\\_SISWA\\_KELUARGA\\_MALAYSIA\\_20211101.pdf](https://www.mcmc.gov.my/skmmgovmy/media/General/pdf2/FAQ_ENG_PERANTI_SISWA_KELUARGA_MALAYSIA_20211101.pdf)
21. <https://www.mof.gov.my/portal/en/news/press-citations/budget-2022-highlights>
22. Only from June 2021, direct uploading of attendance records to MoE server has been regularized.
23. For a more recent review of EdTech in developing country context, see Rodriguez-Segura (2020); for a global review, see Dreesen et al. (2020).
24. However, even if online lessons are regular and easy to follow, some students might still prefer on-site education for other reasons such as a preference for in-school socialization.

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