



Turning to technology

A global survey of teachers' responses to the Covid-19 pandemic



Vikas Pota, Sara Hennessy,
Saalim Koomar, Adam Kreimeia,
Asma Zubairi, Carla Aerts, Claire Gault

September 2021

Contents

Foreword	04
1. Executive summary	06
2. About the survey	16
Survey results	
1. Access to technology	21
2. Teachers and technology	24
3. Technology priorities for schools	31
4. Limitations of technology	39
5. Teacher professional development and technology	46
6. Technology: what teachers want	60
Country reports	
India	68
Nigeria	69
Philippines	70
United Arab Emirates	71
Conclusion	73
Summary of recommendations	78
Appendix	80
About the authors	85
Acknowledgements	88





EdTechHub

Foreword

I have been researching the use of educational technology (EdTech) for over three decades now, with a particular focus on teachers' professional learning and development.

I am a Research Director of EdTech Hub, an 8-year programme that aims to provide evidence to policymakers, researchers, non-governmental organisations, practitioners and other education stakeholders concerning how we can harness EdTech to improve learning outcomes in low- and middle-income countries (LMICs). Our team has been very pleased to collaborate with T4 Education in designing questions and analysing the data from this groundbreaking global survey of teachers' views and needs concerning technology use in their teaching. The survey has similar audiences to our own work and its findings should prove informative and valuable. We hope that take-up of its messages from the voices of teachers will directly inform policy, practice and further research in this important area.

The enormous strength of T4 Education is its focus on developing networks that bring educators together. This is a powerful mechanism and their mission "to support teachers and schools as agents of change" is completely

apt. This timely survey plays a key role in providing up-to-date information about teachers' experiences. The focus on the pandemic period of the previous year brought into sharp relief some of the issues that teachers were already facing, when school closures forced them to adopt new tools and pedagogical approaches. Teachers have risen admirably to this enormous challenge, working tirelessly to upskill quickly and take on board ways of working that were unfamiliar in many contexts, including countries at all income levels. They have had to try and minimise learning losses, often without the requisite infrastructure in place to teach in the ways they considered optimal. We highly commend school teachers worldwide – and particularly thank those who took considerable time out of their immensely busy schedules to complete such an in-depth survey. Your views are absolutely pivotal to validate and complement the other messages emerging from research and anecdotal evidence concerning the pandemic experience for schools.

The impressive response from over 20,000 of you located in a staggering 165 countries around the globe carries significant weight. The anonymous nature of the survey hopefully encouraged you to share your authentic viewpoints.

The impressive response from over 20,000 of you located in a staggering 165 countries around the globe carries significant weight. The anonymous nature of the survey hopefully encouraged you to share your authentic viewpoints.

Without issuing any spoilers(!), some of the findings are disturbing, some are very encouraging, and all of them are insightful. They tell us about what technology devices and resources teachers had available, how they used them, what professional development opportunities they had, and which students suffered most learning loss. The responses are broken down in the analysis into all-important contextual information concerning the specific experiences of teachers in particular regions and urban/rural/other areas, in different types of schools, and with different levels of experience. Above all, the survey provides pointers for how teachers can best be supported going forward. The questions directly asked teachers about what schools and governments can do

and what professional development should focus on. The messages emerging are fascinating, forward-facing and practical and they offer a strong steer

Teachers have spoken – loudly and clearly. It is now up to us to listen and take action so that we can do our very best for the current generation of both learners and teachers.



Sara Hennessey

Reader in Teacher Development and Pedagogical Innovation, University of Cambridge, and Research Director, EdTech Hub



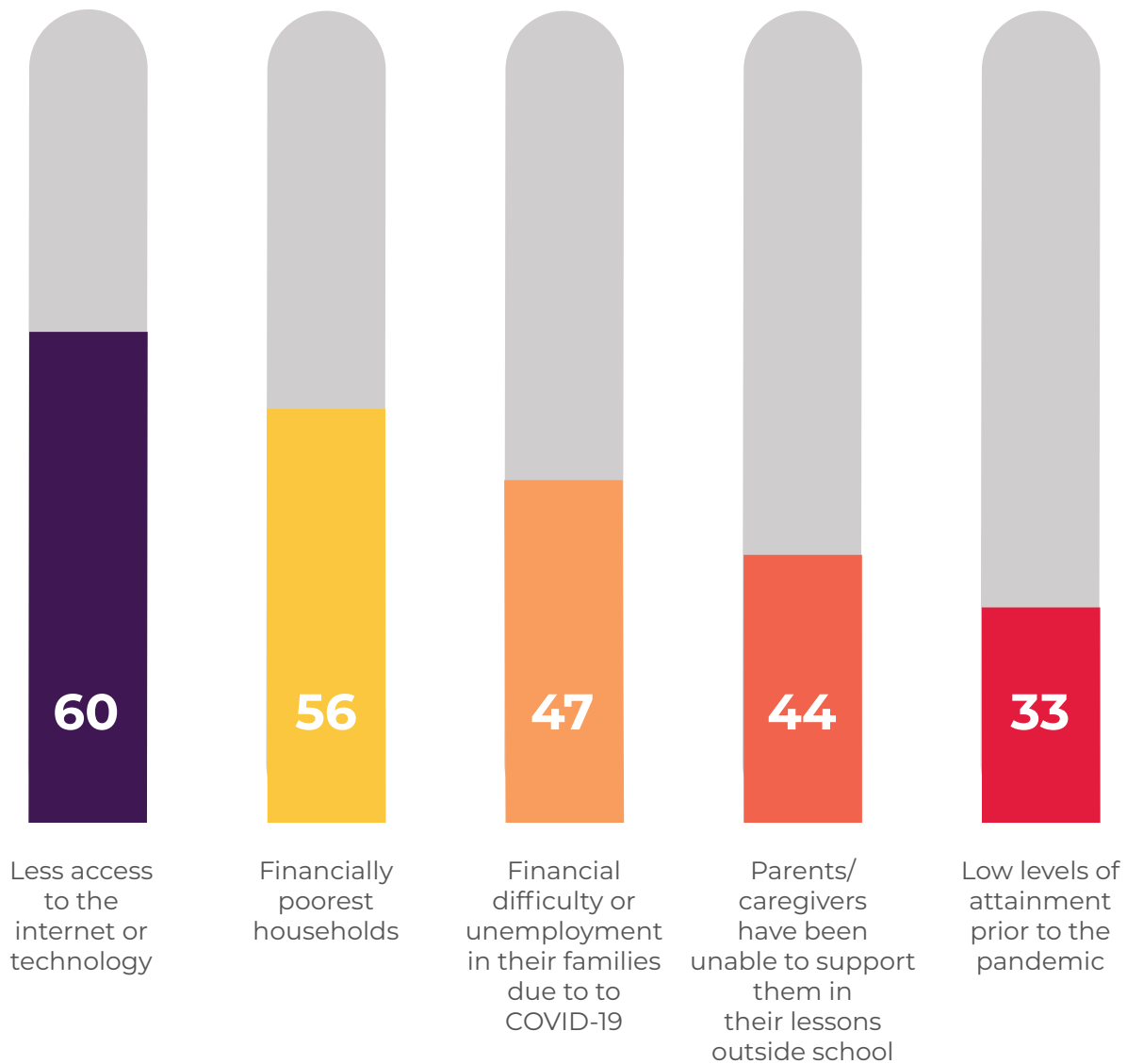
Executive summary

E.1. A new inequality: the deepening digital divide

E.1.1 Government responses to the coronavirus pandemic across the world caused huge disruptions to children's education. Schools were closed for long periods from early 2020. In some countries and regions there were intermittent re-openings but in others schools remained closed, with restrictions and local lockdowns continuing to last well into 2021. T4 education wanted to assess the impact of the pandemic on teachers and learners globally, and so conducted a survey aiming to reach teachers around the world. This large-scale survey of 20,679 teachers from 165

countries across the world asked participants in detail about their experiences and observations during the pandemic. Some of the results make for sobering reading. Children continued to learn during the pandemic as schools switched to remote or hybrid forms of instruction, although their effectiveness in doing so varied greatly. It is no surprise that curriculum-related learning loss among school-age children occurred on a massive scale. Its pattern, though, is striking. Teachers' answers re-ordered the hierarchy of long-observed categories of disadvantage among school pupils and have highlighted the complexities of educational inequality.

Have any of these groups of learners experienced more learning loss than other students? Top 5 answers shown. Shown as a %

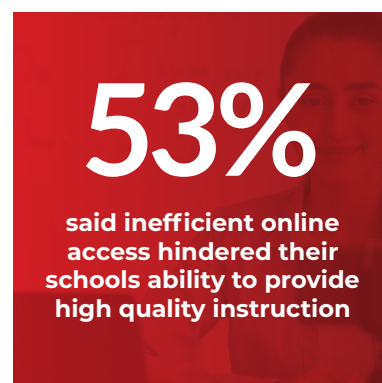


E.1.2 The most frequently observed group of children to suffer learning loss during the pandemic were those with less access to the internet or to technology (60%), teachers reported. These children were more likely to have fallen behind in their studies or to have experienced significant gaps in their learning when compared with pupils from the poorest households (56%), and more so than children whose families experienced financial hardship or unemployment linked to

Covid-19 shutdowns (47%). The fourth highest category was children whose parents were, in their teachers' opinions, unable to support them in remote learning at home (44%). Teachers said that these children were far more likely to experience learning loss than pupils with low prior attainment or from an unstable home background (both 33%), with a disability or other educational special needs (30%) and other categories of disadvantage such as minority language learners.

E.1.3 Of course, many of these categories overlap. It is reasonable to assume, for instance, that children from the lowest socio-economic status families are also likely to have more limited access to broadband or wi-fi internet access at home or to a laptop, tablet or smartphone. And yet, schools have the opportunity to be the great leveller here, if resourced and supported sufficiently. Education systems worldwide must equip them for this urgent task. The use of technology in education is certain to become more sophisticated and more important, even if this current generation of school children never again experiences lockdowns and enforced school closures or restrictions on a similar scale. When technology is made available in schools, it has the potential to bridge the digital divide and support those children who do not have access to devices or the internet at home. The survey shows that many schools do, indeed, provide this but there are large variations. Furthermore, during the pandemic, governments or regional authorities in many countries acted to provide children with laptops, wi-fi routers or dongles so that they could learn at home when schools were closed. But many, too, did not, including in some high-income countries such as England where many school pupils did not receive laptops or tablets until 2021¹. And the results indicate that, even when connectivity and digital devices are available, their quality may vary widely. The T4 survey exposes a sharp digital divide in

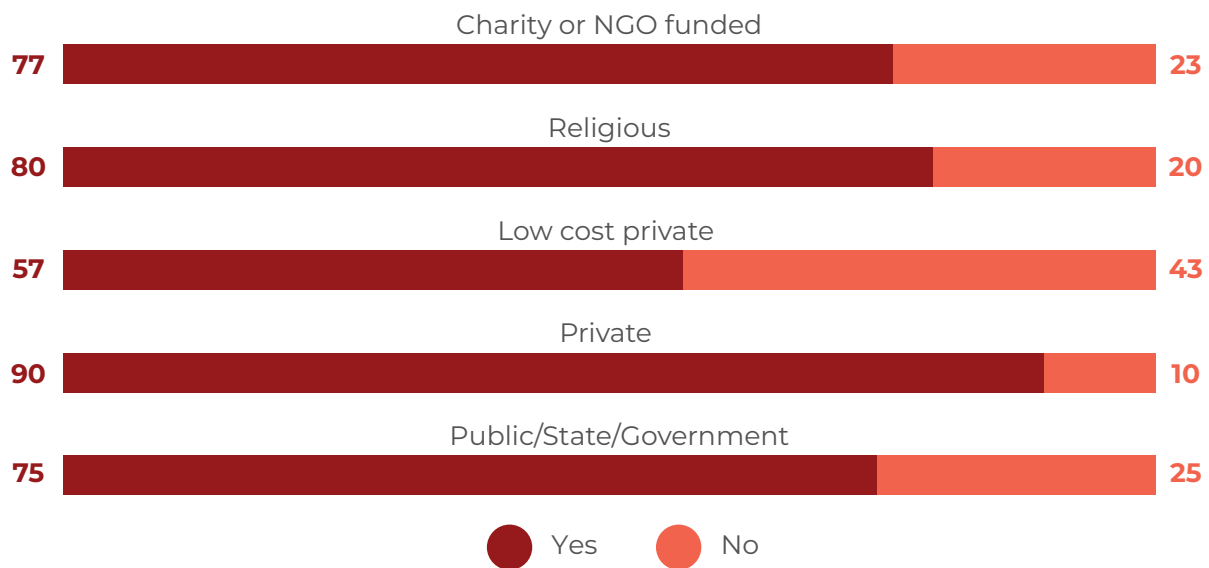
which children in government-funded and, especially, low-cost private schools and schools in rural locations, were much more likely to have less access to technology throughout the pandemic. Their education suffered in consequence.



E.1.4 Almost a quarter of teachers (23%) reported that their school did not have access to the internet at all. More than half (53%) said insufficient online access hindered their schools' ability to provide high quality instruction to children during the year that spanned the global peak of the pandemic. Shortages of technology hardware for instruction also constrained the capacity of schools, more than half of teachers (52%) said. A statistic that leaps out among the survey's findings is that more than four in ten teachers (42%) said that they brought their own digital device, whether it be a laptop, tablet or even a smartphone, into their school for educational use. This is not a reasonable expectation for any education system to place upon its teachers and is highly concerning.

E. 1.5 Among teachers who took part in the survey, 29% said that there was only one computer, laptop or tablet for instruction available for the entire school and 16% said that children had to bring their own device with them. Another 14%

¹ <https://www.gov.uk/guidance/get-help-with-technology-for-remote-education-during-coronavirus-covid-19#how-laptops-and-internet-access-were-made-available-for-disadvantaged-children-and-young-people>

My school has access to the internet. Shown as a %

said there was only one computer, laptop or tablet for each class. Schools in rural areas, and in towns or semi-dense locations, made less use of technology than schools in cities and metropolitan areas. While this might be expected, the digital divide between urban and rural schools is stark and means that

hundreds of millions of children's learning was adversely affected due to where their families live. When asked whether their children's education was hindered by poor internet access, the gap between rural and urban school teachers was 15 percentage points (61% versus 46%). Asked if inadequacy of digital

The T4 survey exposes a sharp digital divide in which children in government-funded and, especially, low-cost private schools and schools in rural locations, were much more likely to have less access to technology throughout the pandemic.

And here, the greatest surprise is that it was not the cohorts of more recently qualified teachers from the so-called ‘digital first’ generation who led the pivot to adapt to this new normal for remote learning and instruction. Instead, it was the most experienced teachers who used digital tools the most. They taught more classes online. They deployed the most sophisticated and creative types of remote teaching such as recording videos or audio messages for their students.

resources held them back, the rural-urban gap in teachers’ responses was apparent, with a 13 percentage point difference (59% versus 46%).

E.1.6 Private schools were far more likely to have good-quality internet access and digital resources. Schools run by charities or non-governmental organisations (NGOs) were also better technologically resourced than government-funded public schools and religious schools. In contrast, the low access and use of technology in low-cost private schools stood out. Low-fee private schools have grown rapidly in recent years in many low and middle-income countries (LMICs) to meet demand from parents for an alternative to government schools, especially in rural and remote areas. Nonetheless, low-cost private schools offered far less access and encouragement to use digital tools in teaching and learning than government and other schools. This difference was greater than can be explained by the rural-urban divide. For the most prevalent technology used during the pandemic, video conferencing tools (e.g. Microsoft Teams, Zoom), there was a 30 percentage-point difference in use between low-cost private schools and charity/NGO schools (40% versus 70%). Likewise, teachers in low-cost private schools have less access to tech at home (59% versus 89% among

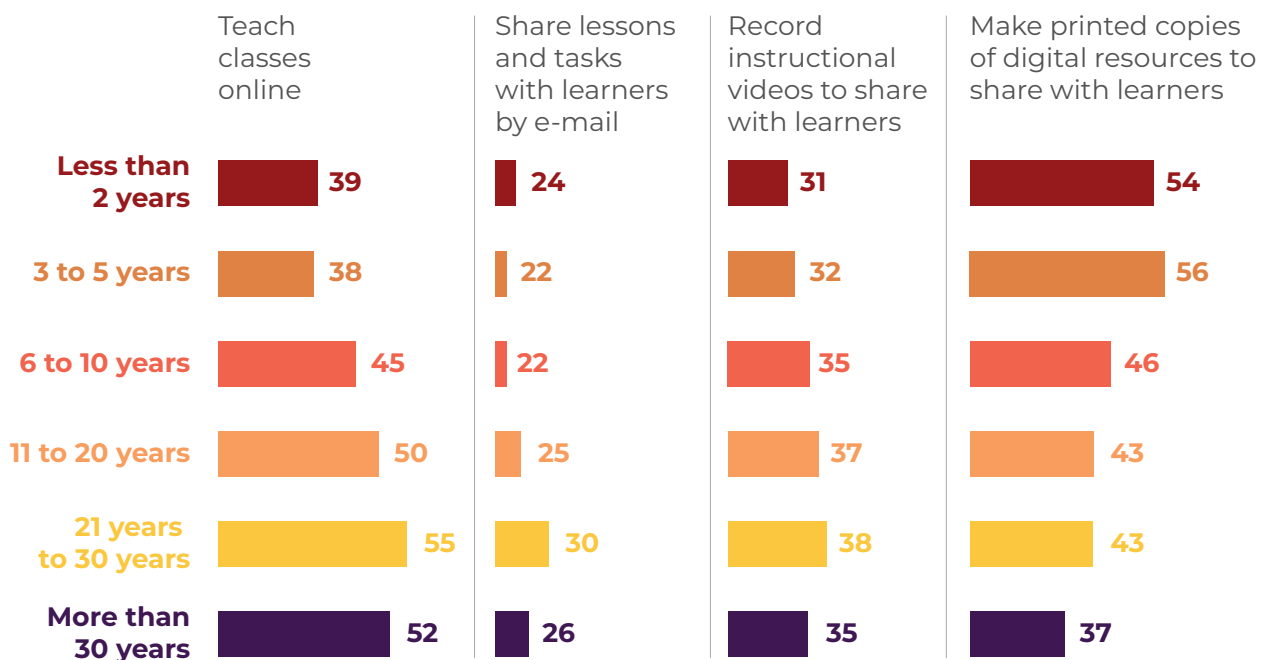
private school teachers). This may reflect disproportionately lower-paid teacher salaries in low-cost private schools as well as more such schools being situated in rural areas.

E.1.7 Global regional differences in technology use and internet access at school and home were marked, although unsurprising, and were mostly in line with income-level disparity: Sub-Saharan Africa and East Asia & the Pacific regions ranked lowest for use of technology. They also ranked highest for experiencing technology or internet-related issues obstructing teaching; North America and Middle East & North Africa reported the lowest frequencies of technical barriers. These figures may, however, mask within-region variation in socio-economic status and technology use among teachers. For instance, 26% of teachers in North America reported insufficient internet access.

More experienced teachers emerge as the most ‘tech-savvy’

E.2.1 The findings of this survey tell another story, too. It is a story of how teachers stepped up to the unprecedented challenge of educating and guiding children during a global pandemic that led to lockdowns and restrictions on normal education practices. Teachers did so by embracing

Did you do any of the following in the COVID-19 pandemic? By teacher experience Shown as a %



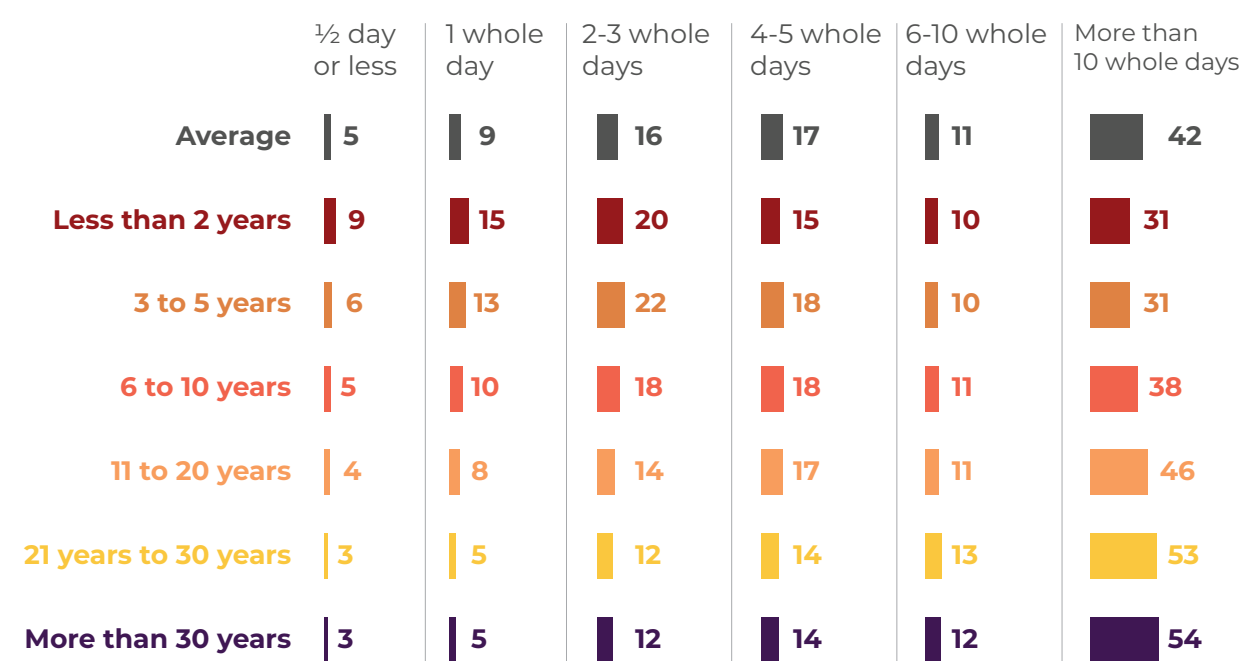
and mastering new digital tools for instruction and by exploring and developing digital pedagogies. And here, the greatest surprise is that it was not the cohorts of more recently qualified teachers from the so-called 'digital first' generation who led the pivot to adapt to this new normal for remote learning and instruction. Instead, it was the most experienced teachers who used digital tools the most. They taught more classes online. They deployed the most sophisticated and creative types of remote teaching such as recording videos or audio messages for their students. Hence, the findings well and truly dispel the myth of

older teachers being reluctant to embrace new technologies. Theirs was the group, typically those with more than 20 years' experience, that in fact emerged in the pandemic as the most 'tech-savvy' teachers.

E.2.2 For instance, 55% of teachers with between 21 and 30 years' experience said they taught lessons online, compared with 38% who had taught for between 3 and 5 years. Similarly, 48% of this group of more experienced teachers used their school's virtual learning platform to share lessons and tasks with pupils but only 31% who had taught for fewer than two years.

Younger, less experienced teachers struggled with this. Interestingly, older teachers with greater classroom experience also proved themselves to be much more willing to show high degrees of creativity and to experiment with new modes of digital instruction than less experienced teachers.

How much time in total was spent on your professional development or training over the last 12 months? By teacher experience. Shown as a %



Conversely, 56% who had taught for between 3 and 5 years made printed copies of digital resources to share with their students compared with only 37% who had taught for longer than 30 years.

E.2.3 There was a negative correlation between teachers' experience and the degree of encouragement they received to use digital resources to plan and teach lessons, with 83% of the longest-serving teachers saying they were encouraged to do so, rising to 91% among the least experienced. Similarly, more experienced teachers engaged in significantly greater quantities of professional development during the pandemic than those who joined the profession more recently. 54% of teachers with 30 plus years' experience undertook more than 10 whole days of training over the previous year, this falls to 31% for teachers who have been in the classroom for 5 years or fewer.

We might have expected the opposite, since newly qualified teachers should be receiving more hands-on support.

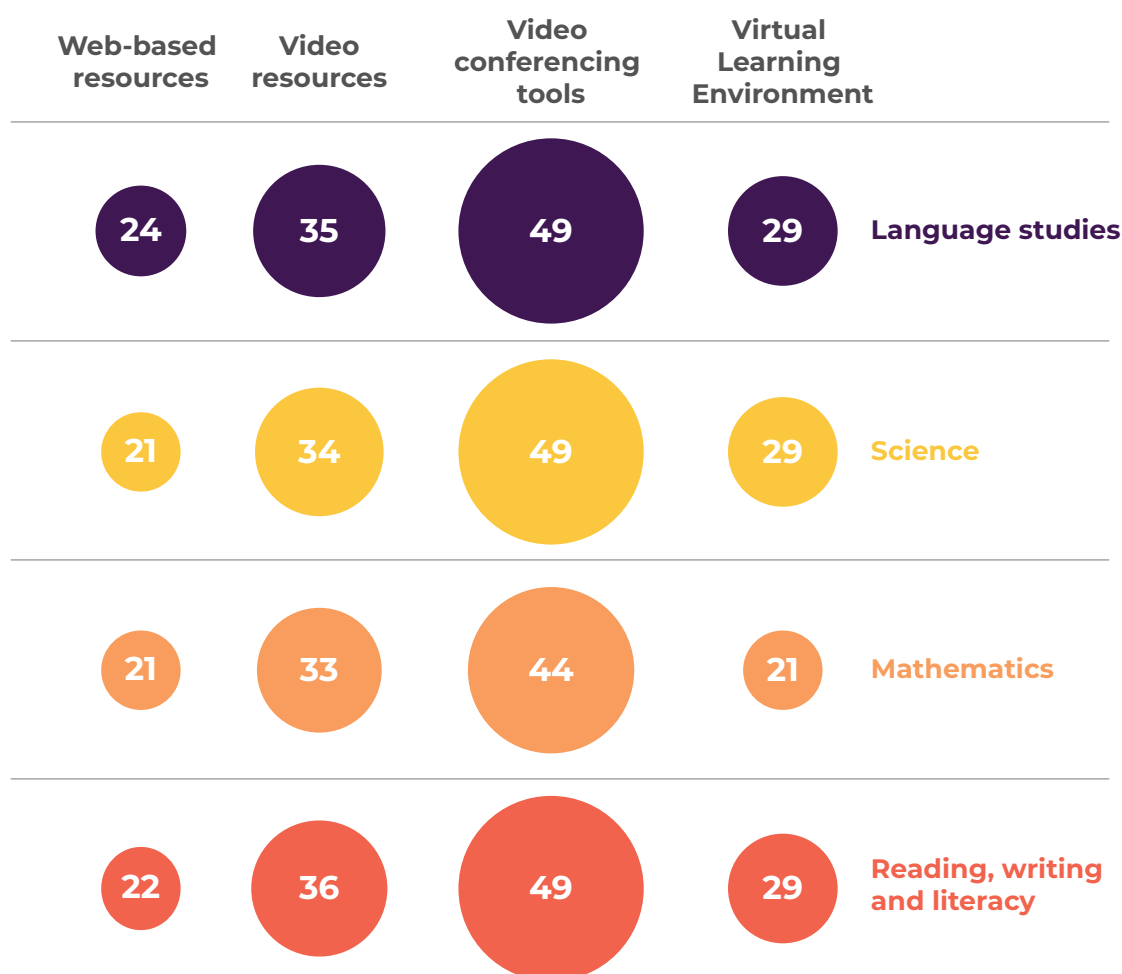
E.2.4 This digital upskilling of teachers worldwide is highly significant, as is the leadership role shown by the most experienced classroom teachers. The explanation for this trend is not likely to lie in degrees of digital dexterity prior to the pandemic but in skill and confidence in the craft of teaching. More experienced teachers acquire greater knowledge and understanding of how children learn and can perhaps adapt their pedagogy more easily when faced with new demands. They appeared better able to transfer their long-honed skills of in-person classroom teaching to the direction and coordination of remote learning, allowing them to focus on the digital resources and techniques they needed to deploy.

E.2.5 Younger, less experienced teachers did not adapt to this switch to remote, digital-led instruction to the same degree. Interestingly, older teachers with greater classroom experience also proved themselves to be much more willing to be creative and experiment with new modes of digital instruction. Not only was their appetite for training and development much greater than that of their early-career colleagues, but more of this cohort paid for their professional development themselves. Among teachers with between 21 and 30 years' experience, 27% said they or their families paid for it themselves, while

for those who had taught for five years or fewer this proportion fell to 19%.

E.2.6 A positive finding from the study was the substantial time spent on professional development, especially in context of the pandemic and the unique challenges it created. Whilst there were variations by school type, region and school location, 42% of teachers spent more than 10 days undertaking professional development during the previous year. Assuming a 7-hour day, this would equate to more professional development time than the usual average in OECD countries of 62

What kind of tools or resources did you learn about during your professional development? Shown as a %



The upskilling of the teaching profession worldwide described in this survey, and the reinforcement of commitment and enthusiasm for their craft described by so many teachers, offers an immense opportunity as we emerge from the Covid-19 crisis and school systems begin to plan for the future.

hours annually (Henshaw, 2021)². This increased time spent suggests that schools and/or government institutions responded positively to the pandemic challenge.

E.2.7 One oddity to emerge concerned teachers of mathematics and their engagement with technology. Maths teachers were consistently the least likely among teachers of core curriculum subject areas to use a range of digital tools for teaching and learning. When teachers were asked if they used digital resources during the pandemic to explore new teaching methods on most days, the answers by curriculum subject area were: reading, writing and literacy (47%), language studies (46%), science (45%), maths (34%). Asked if they taught classes online, responses by subject were: language studies (59%), science (55%), reading, writing and literacy (55%), and maths (51%). These findings are corroborated by the OECD (2018) TALIS report³ where maths teachers were also found to utilise digital tools for teaching the least in comparison to other core curriculum areas.

E.2.8 Teachers of mathematics also reported the lowest proportions of almost every type of training in comparison to teachers of all other curriculum subjects, with an average difference of 4.7 percentage points between maths teachers and the subject with the highest share. Part of this picture may be explained by the fact that textbooks are more likely to be available for mathematics than for other subjects. But the same is true of digital resources, which are commonly available for maths. The gap, therefore, remains puzzling given that the nature and content of maths makes it in many ways a curriculum area very suited to digital teaching and learning strategies, including using sophisticated, open source software and apps such as Cabri Geometry.

E.2.9 In contrast to the comparatively low uptake of digital tools and training amongst maths teachers, both digital uptake and the quantity of training were noticeably higher for science teachers and language studies teachers in comparison to other subjects. 49% of teachers of both these curriculum subjects engaged in the greatest quantity of training and professional development, of more than 10 whole days.

² <https://www.sec-ed.co.uk/news/a-35-hour-a-year-cpd-entitlement-could-stop-12-000-teachers-quitting-wellcome-education-policy-institute-retention-recruitment/>

³ <https://www.oecd.org/education/talis-2018-results-volume-i-1d0bc92a-en.htm>

E.2.10 Assessment was one of the areas more generally for which technology was used relatively less frequently. The survey found that 27% of teachers used technology for assessments daily, 29% weekly and 20% once or twice a month. Another 7% of respondents used technology for assessments once or twice a year and 17% never or almost never did so. That relatively fewer teachers used technology to assess student learning is curious, given that assessment is integral to teaching and learning. It might reflect a lack of access to computer-based assessment tools. The use most days of online tools or computer-based testing to assess students' learning was also notably higher in the Middle East & North Africa (45%) and in North America (45%) than in other global regions (e.g., East Asia & Pacific = 21%, Europe & Central Asia = 28%).

E.2.11 This suggests that the use of technology for assessment reflects the instructional and policy approaches of education systems in different parts of the world. Undertaking assessments is more challenging in school contexts with large class sizes and front-of-class teaching practices.

E.2.12 Nonetheless, the overall picture is clear. Faced with a once-in-a-generation challenge of switching in rapid order to a new model of remote teaching and learning, the teaching profession worldwide by and large rose to this task. This was despite the limitations faced by many of poor internet access and an inadequate supply of digital devices, and indeed of limited access to software

on these devices. Perhaps most encouraging of all, most teachers relished doing so. Teachers were asked what the impact of switching to remote instruction and using educational technology tools had been on the quality of their teaching: the vast majority (89%) considered that the experience of teaching during the pandemic had made them better teachers and over half had become more enthusiastic about teaching. Just 4% said it made them worse teachers.

E.2.13 This came at a cost to teachers themselves. Asked to describe what happened to their own physical, mental and emotional wellbeing since the pandemic started, 39% said that their wellbeing had suffered. A further 36% reported that their wellbeing was about the same and only 25% said it had improved. But when participants were asked about their attitudes to teaching since the pandemic started, half (50%) were more enthusiastic about their vocation and fewer than a quarter (22%) less enthusiastic. The upskilling of the teaching profession worldwide described in this survey, and the reinforcement of commitment and enthusiasm for their craft described by so many teachers, offers an immense opportunity as we emerge from the Covid-19 crisis and school systems begin to plan for the future.





About the survey

M.1 Methodology and weighting

M.1.1 The T4 Teachers and Technology Global Survey was open between April 7 and May 23, 2021 and included 44 questions, many of them detailed (see Appendix). In order to maximise participation from school teachers worldwide, it was available in 18 languages: Arabic, Bengali, Brazilian Portuguese, English, French, German, Hindi, Japanese, Malay, Mandarin, Marathi, Portuguese, Russian, Serbian, Spanish, Swahili, Tamil and Urdu. It was intended to take approximately 25 minutes to complete.

M.1.2 Questions were designed to categorise educators' experiences of teaching during a global pandemic and asked teachers about their own and their pupils' access to technology, how teachers used technology to teach remotely, about digital resources they used, limiting factors teachers faced in doing so and what levels of

learning loss they observed among children they taught. Three of these questions were, by agreement, taken from the OECD's Programme for International Student Assessment (PISA) as an additional benchmark for its three-yearly sampling survey of 15-year-olds' ability to use reading, mathematics and science knowledge and skills. Another series of questions asked teachers about what training and professional development they were offered or received during the pandemic and what participants thought should be priorities to address learning loss among children.

Respondents were also asked their age, gender, years of teaching experience, the location and type of school at which they taught, the age of children in their class or classes and the subjects they taught. Language studies teachers have been categorised separately in comparisons since they formed the largest subject group; teaching of languages additional to the language of instruction is extremely

common and is not necessarily captured by “literacy” which normally refers to the language of instruction.

M.1.3 A total of 24,407 responses were logged; of these, 3,728 (or 15%) were excluded from this analysis because either no items were completed by the respondent or else no data were provided beyond the demographic information. The analysis is based on the remaining 20,679 surveys.

M.1.4 Approximately half the respondents were teachers from city or urban schools, over a third from rural areas, and the rest from towns or schools in semi-dense locations. The vast majority (approximately three quarters) of respondents were from publicly-funded government schools. Respondents from private schools formed approximately a fifth, and charity or non-governmental organisation (NGO) schools (6%), religious (2%), and low-cost private (2%) made up the rest. Teachers with 11-20 years’ experience made up the largest percentage of respondents, with approximately a third. Teachers who had taught for 6-10 years comprised a quarter. A fifth had taught for 3-5 years. 14% for 21-30 years and 8% for less than two years. Language studies, science, mathematics, and reading, writing and literacy (RWL) teachers each made up approximately 10% of responses. ICT and computing teachers followed with 6%, with the remaining subjects each 5% or less.

M.1.5 The results were disaggregated by five demographic characteristics: school location, type of school, the teacher’s length of experience, their subject area, and by geographic region (using World Bank regions).⁴

M.1.6 Responses have been weighted against what we know about the global teacher population by region, using UNESCO Institute for Statistics (UIS) data⁵. Teachers from the East Asia & Pacific region, for example, make up 31% of the global share of teachers. However, as a proportion of total T4 Survey respondents, they made up 38%. There was a particularly large cohort from the Philippines (n = 7,289). Conversely, the teachers from the Latin America & Caribbean region make up 10% of the global profession but comprised only 3% of respondents. The analysis has taken into account these issues, and given more weight to responses from teachers emanating from regions which are relatively under-represented among survey respondents compared to their share of the global teacher population (e.g., Latin America & Caribbean) and less weight to those which are over-represented (e.g., East Asia & Pacific). Weightings were not applied to country analyses. Non-responses have been removed from all findings; percentages are calculated based on the total number of responses to each question.

4 <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

5 <https://datacatalog.worldbank.org/>

The sample was derived through publicity to networks and social media accounts associated with the authoring organisations (primarily T4 Education and EdTech Hub) and their global partners, aiming to distribute the survey as widely as possible, and to reach low and middle-income countries (LMICs) and government schools in particular.

M.1.7 A separate analysis on the same data but before weighting was applied was conducted by a T4 Education analyst to generate some country reports featuring those countries with the most respondents. Follow-up interviews were carried out with a small number of teachers from different countries who completed the survey. The resulting teacher profiles are included to provide richer insights into how these teachers engaged with technology for teaching and learning during the pandemic. These individuals were chosen by T4 to broadly exemplify the survey's findings although their own experiences may not match the data trends in every item.

Limitations of the survey

M.2.1 The sample was derived through publicity to networks and social media accounts associated with the authoring organisations (primarily T4 Education and EdTech Hub) and their global partners, aiming to distribute the survey as widely as possible, and to reach low and middle-income countries (LMICs) and government schools in particular. The sampling strategy was thus not representative or systematic, but rather a mixture of purposive, convenience and

snowballing strategies. A significant degree of skew towards certain countries emerged, especially the Philippines. We took into account the numbers of teachers estimated to be working in each geographical region in order to weight findings by region. However, we do not, for instance, currently know the percentages of specific types of schools in each country so cannot judge how representative the responses are on those grounds.

M.2.2 The length of the survey meant a low completion rate: of the surveys included here, 47% (or $n = 9,624$) started the survey but did not complete it fully. Moreover, a degree of selection bias is likely since teachers required access to some form of technology with connectivity to respond to the survey in its digital form; teachers with no access will not have been able to participate. Teachers with an interest in technology may also have been more likely to find the survey, for example on social media, and more motivated to complete it.



MEET THE TEACHER

Andria Zafirakou, urban school, England

Andria Zafirakou is the first to admit that, before the pandemic, she had little familiarity with technology. All that changed when lockdowns forced her to teach remotely.

Ms Zafirakou, 42, has taught art and textiles for 16 years at Alperton Community School in Brent, north west London, an area of high deprivation.

At first she assigned tasks to children through Google Classroom, with little interactivity. Later, she moved to video conferencing on Google Meet.

“What was really fascinating was, having taught in a similar way for all that time, I realised everything had to change, I couldn’t use the resources that I had used in the past,” she says. “I would teach one lesson but I would spend two and a half hours planning for that lesson.

“Don’t forget not every child has paint and paper at home. I would have to come up with lessons that were innovative, different, that they could do at home and still be creative and still follow what we were meant to be learning. I think I taught the most incredible lessons, which I was proud of.”

Ms Zafirakou is a member of many teacher networks and spent weekends swapping ideas for techniques and resources with teachers across the world.

“I spent a lot of time upskilling myself, learning new things, discovering new artists, really moving away from what I did in the past, which in that context was irrelevant,” she says. “For example, there is an artist called Robert Rauschenberg. He would find objects around the house and turn them into portraits: food, a screwdriver, tools. So, I set that as a project for my pupils aged 12 and 13 who at that time were looking at portraiture.”

“And my actual way of teaching, my pedagogy had to change. I had to think about the way I would ask a question, the way I would check my students were learning. Normally your eyes are everywhere and you can check kids’ learning and you can see their work, and say ‘that’s not right, try it like this’. When you have been teaching as long as I have, teaching is second nature. You feel comfortable, you feel confident. We self-reflect quite a lot. We are able to say, ‘that wasn’t good’, ‘that was rubbish’, ‘I don’t feel comfortable about that’. I have a bit more confidence to say, okay, how can I make it better?”

“It made me even more determined to be brilliant in the classroom, to make my lesson the lesson every single kid would want to come to and for it to be their lesson of joy or fun, of excitement.”



Survey Results

1. Access to technology

Teachers and internet access

1.1.1 Among all teachers who took part in the survey 77% said their school had access to the internet, meaning almost a quarter (23%) did not have online access. A slightly higher proportion of teachers said all or most teachers have access to the internet at home: 79% said they did and 21% did not have internet access at home.

1.1.2 These proportions seem high, particularly for LMIC contexts. The World Bank estimates that 35% of the population in Global South countries has access to the internet, rising to 80% in advanced economies. Based on previous evidence, teachers generally have higher rates of access to the internet than population averages.

1.1.3 While it is encouraging to see such high figures, especially regarding home internet access, it is also important to ensure that teachers are not required or expected to use time at home to undertake tasks needing internet access. If they need to do so, it is important that they are compensated in some way, since data costs can be high and they could be using their free time to perform work-related tasks.

1.1.4 A separate survey of teaching unions' experience throughout the pandemic structured the question differently when asking about internet access, by using a multiple-

choice scale that included an option of 'limited access'⁶. This found that in rural areas approximately 75% of teachers had limited access to the internet, demonstrating that the quality of internet access is an important factor to consider.

1.1.5 The survey found that internet access in rural schools (64%) was 22 percentage points lower than for urban schools (86%) and 17 percentage points lower than at schools in semi-dense areas (81%). The gap in teachers' access to the internet at home was narrower at 11 percentage points: 72% of teachers in rural areas said they had internet access at home, compared with 83% in cities or urban areas.

1.1.6 Again, this is lower than found in other global surveys. Selection bias must be considered here in relation to teachers' interest in technology and internet access to complete the survey. Colcough (2020)⁷ asked whether educators usually have access to the internet in their workplaces. In urban areas the responses were approximately 55% 'Yes', and 95% 'Yes/limited access', whereas in rural areas they reported approximately 25% 'Yes', and 75% 'Yes/limited access'.

1.1.7 Teachers at private schools were most likely to say their school had internet access (90%), followed by religious schools (80%), charity/NGO schools (77%) and government-funded public schools (75%). By far the lowest proportion was found in teachers at low-cost private schools where 57%

6 https://issuu.com/educationinternational/docs/2020_ei_research_teachingwithtech_eng

7 <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

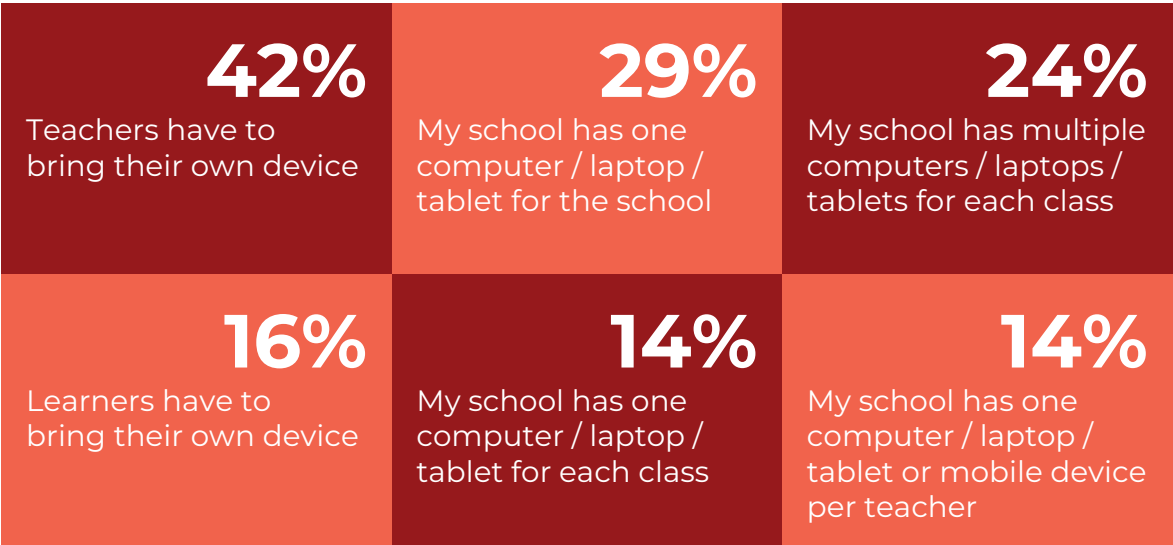
of teachers said their school had internet access. A similar pattern was found when teachers were asked if all or most teachers have access to the internet at home, although gaps were very slightly narrower (59% of teachers at low-cost private schools, compared with 89% of other private school teachers).

1.1.8 The disparity between low-cost private schools and the rest is concerning, although far fewer responses to the survey were received from teachers at these schools, (e.g. public = 11,480, and low-cost private = 366). The differences could be due to the resources available at low-cost private schools, but could also reflect the geographic location of these schools, which are more likely to be in rural and remote areas⁸. The disparity around teachers having access to the internet at home between low-cost private schools and the rest is also concerning. Again, this could be due to these schools' location. However, it could

relate to their teachers' socio-economic status; there is evidence to suggest that teachers working at low-cost private schools receive disproportionately (and sometimes exploitative) lower salaries than their government counterparts. Furthermore, these teachers are often unqualified⁹.

1.1.9 The widest gap for internet access was by geographic region. In Europe & Central Asia, 92% of teachers said their school had access to the internet while in Sub-Saharan Africa the figure was 47%, a range of 45 percentage points. The share for Sub-Saharan Africa was by far the lowest of the World Bank regions; in the second lowest region, South Asia, the proportion was 75%. There was a similar pattern when teachers were asked whether they had internet access at home: the figure was highest in North America where 94% of respondents said they did, while in Sub-Saharan Africa only 55% of teachers did.

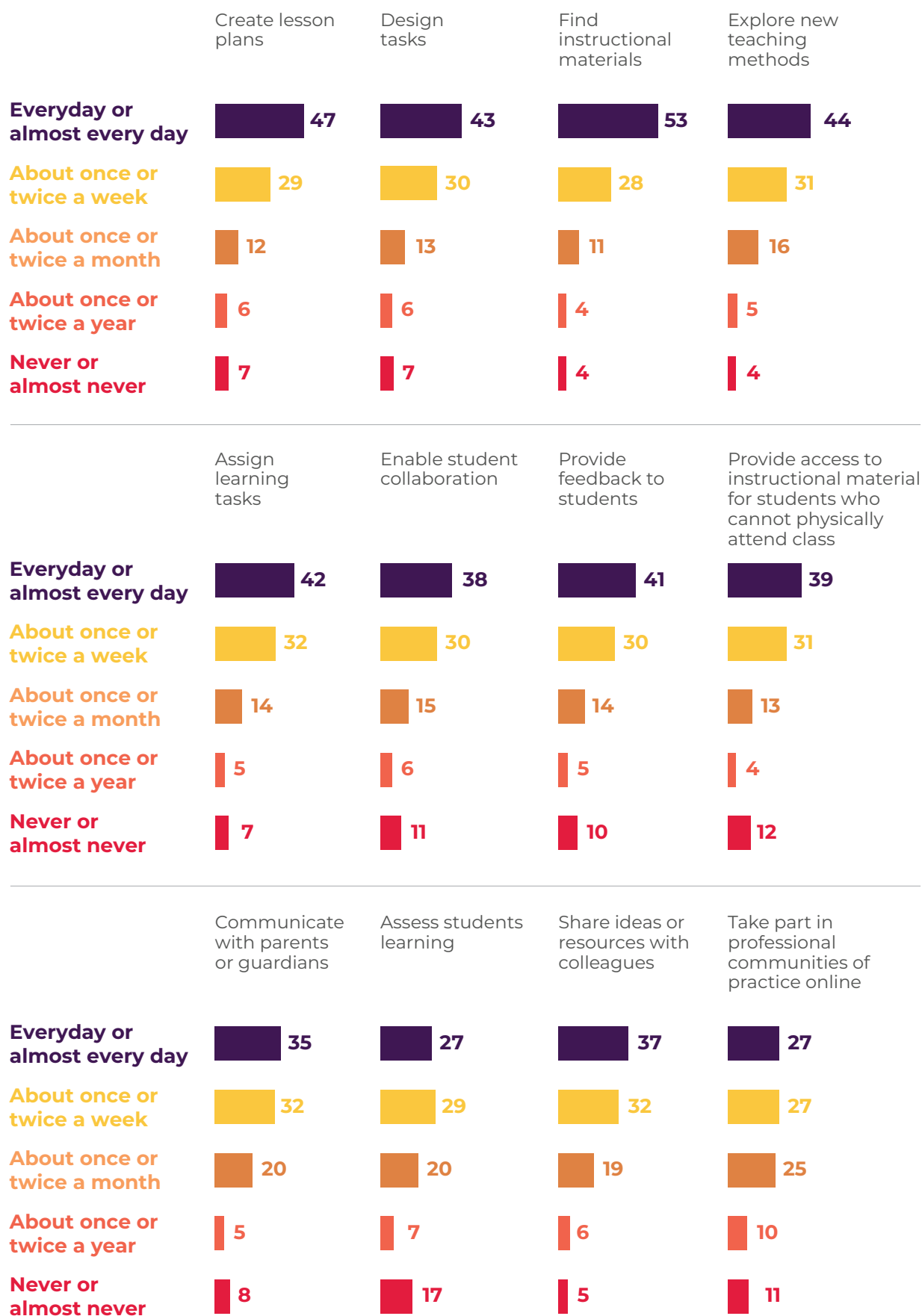
Technology access.



8 https://www.enterprise-development.org/wp-content/uploads/Low-cost_private_schools.pdf

9 https://www.enterprise-development.org/wp-content/uploads/Low-cost_private_schools.pdf

During the last 12 months how often did you do the following (making use of technology)? Shown as a %



That relatively fewer teachers used technology to assess student learning is notable, given that assessment is integral to teaching and learning.

1.1.10 There was also a relatively large difference, of 10 percentage points, among teachers in the East Asia and Pacific region between the two, with 67% of teachers identifying that all or most teachers have access to the internet at home compared to 77% saying their schools had internet access. This is the opposite of the typical trend across all other regions, where teachers were more likely to have internet access at home than in their school.

2. Teachers and technology

How teachers used technology

2.1.1 Teachers reported that they used technology heavily throughout the 12 months preceding the survey, which covered the peak of the global coronavirus pandemic in 2020-21. Between a quarter and just over half of participating teachers said they made use of technology daily, while at least half said they used technology weekly.

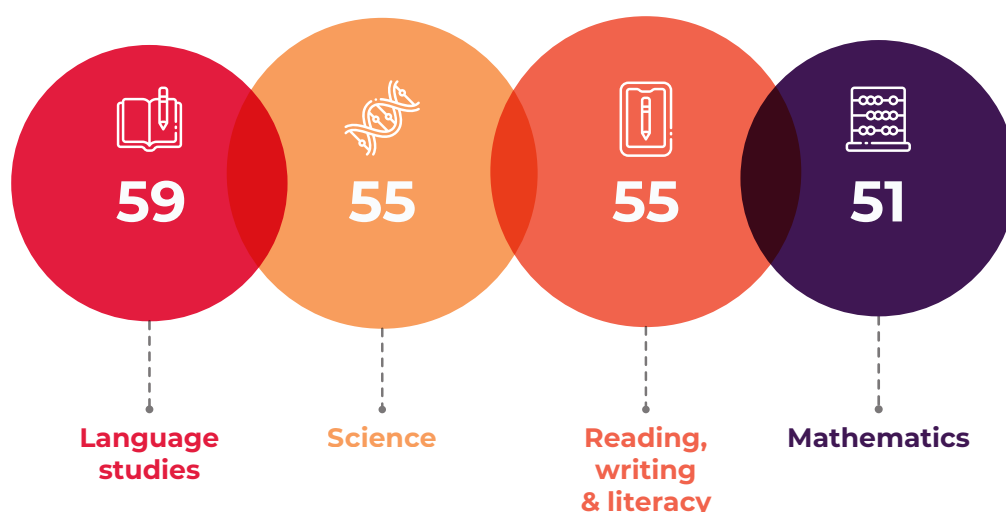
2.1.2 Among those who used technology daily or weekly, the most common teaching and learning tasks were to find instructional materials (81%), design tasks (73%), create lesson plans (76%), and to provide access to instructional materials for students

who could not physically attend class (70%).

2.1.3 Communication was another common task for which teachers used technology: 67% did so to communicate with parents either daily or weekly, 71% to provide feedback to students and 68% to enable student collaboration.

2.1.4 Technology was used relatively less frequently for student assessment: 27% did this daily, 29% weekly and 20% once or twice a month, while 7% of respondents used technology for assessments once or twice a year and 17% never or almost never did so. That relatively fewer teachers used technology to assess student learning is notable, given that assessment is integral to teaching and learning. This is potentially an area that could benefit from training provision and further investigation into how teachers can effectively apply technology for assessment. The low usage could reflect a lack of access to computer-based assessment tools. It could, however, be due to lower frequency of assessments generally, especially for marginalised groups in low-income communities¹⁰. A higher proportion of teachers in urban or metropolitan schools (62%) used technology daily or weekly to assess student learning compared with teachers in semi-dense (52%) and rural (50%) schools. The use of online tools or computer-based

¹⁰ <https://www.ukfiet.org/2020/covid-19-adaptations-challenges-in-assessing-learning-in-marginalised-communities/>

Teachers who taught classes online in the Covid-19 pandemic. Shown as a %

testing to assess students' learning was also notably higher in the Middle East & North Africa and in North America, where school systems are far more assessment-orientated, than in other global regions.

2.1.5 Using technology to interact with other teachers in a community of practice ranked lower (54%) while sharing ideas or resources with teaching colleagues (69%) was among less common uses. This suggests there may be scope for the promotion of technology for semi-structured interactions between teachers by schools or by regional authorities or governments.

2.1.6 Teachers in city schools tended to use technology more frequently than those in schools in sub-urban or rural areas. The more general pattern of an urban versus rural technology divide is explored further in Henry (2017)¹¹, who found for instance that there are just

600,000 internet users in rural China in contrast to 60 million total internet users in China.

2.1.7 Charity/NGO and private schools had substantially higher proportions of frequent technology use daily or weekly relative to other schools (daily/weekly use is approximately 70% for a majority of items whereas in low-cost private schools is around 50%). Approximately half of respondents in charity/NGO and private schools reported using technology daily for the majority of items. As an example, 64% of teachers in charity/NGO schools used technology every day to find instructional materials; in low-cost private schools this figure was 41%. Differences in school type on education outcomes, especially in relation to equity, affordability and outcomes in low-cost private schools, are discussed by Akmal et al. (2019)¹².

¹¹ <https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2019/03/Henry-Bridging-the-Digital-Divide-2019.pdf>

¹² "https://www.cgdev.org/blog/low-cost-private-schools-what-have-we-learned-five-years-dfid-rigorous-review"

2.1.8 Teachers of reading, writing and literacy (RWL) and science teachers were more likely to use technology daily for their teaching than teachers of mathematics. These findings are corroborated by the OECD (2018) TALIS report¹³ where maths teachers were also found to utilise digital tools for teaching the least in comparison to other core curriculum areas. This might be explained by the fact that textbooks are more likely to be available and easier to follow remotely for mathematics than for other subjects; however there are many sophisticated, open source software and apps for maths such as Cabri Geometry. The finding is puzzling given that the nature and content of maths makes it in many ways a curriculum area very suited to digital teaching and learning strategies. It would be useful to follow up to try to understand the factors contributing to this divergence and what implications it has for teachers of different subjects.

Types of remote learning

2.2.1 Types of remote learning used by teachers varied greatly. Asked to indicate from a list of 12 activities which they deployed, communication-related activities formed the three most commonly cited by participating teachers. The most frequent was contacting pupils or students through messaging services such as SMS, WhatsApp or similar platforms, which was selected by 63%. Another 54% said they contacted parents using similar instant messaging services. These ranked much higher

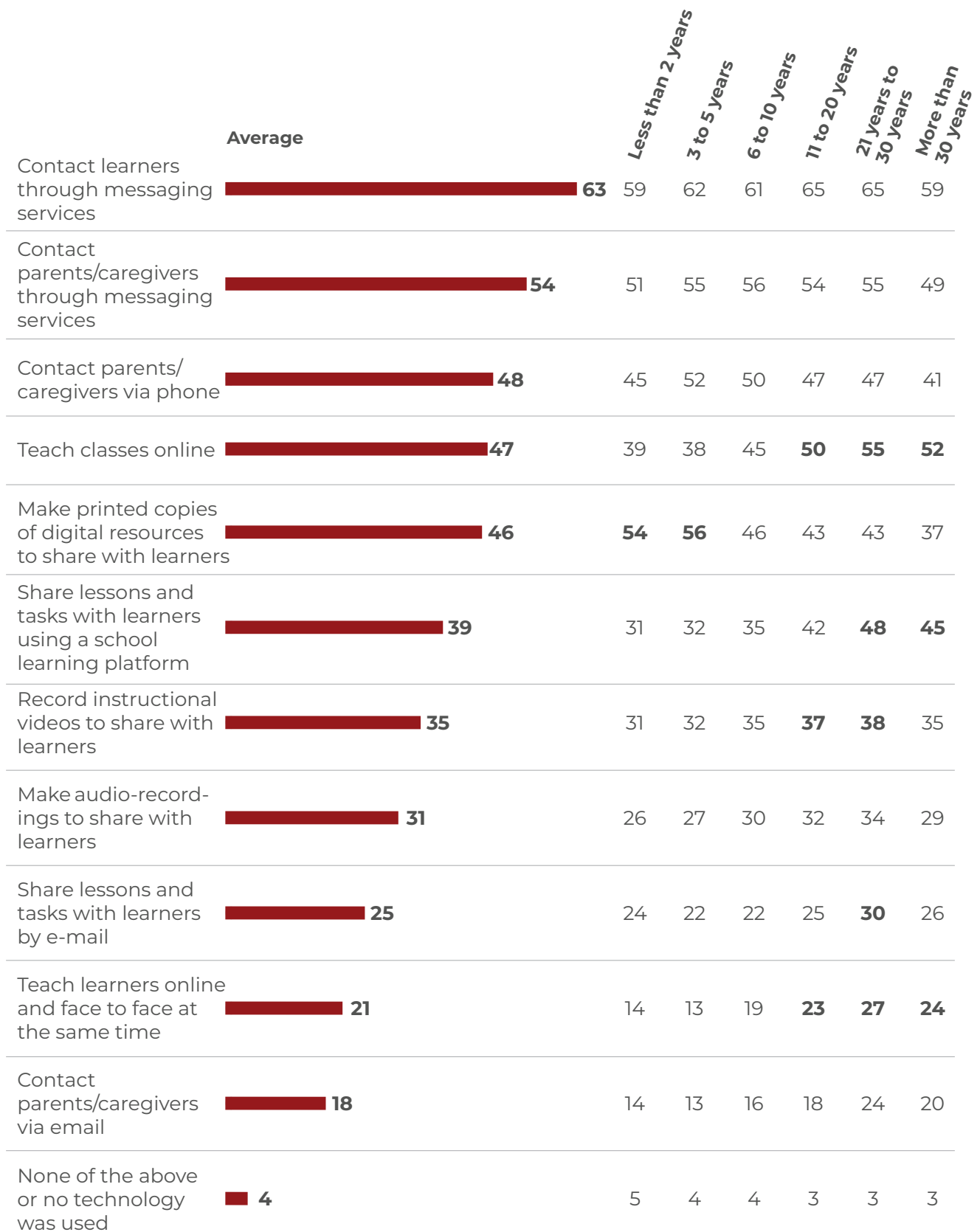
than more traditional means used by teachers to contact parents such as by telephone (48%) and email (18%). Another 39% of teachers said they used a school learning platform to share lessons and tasks with students, while 25% did so via email.

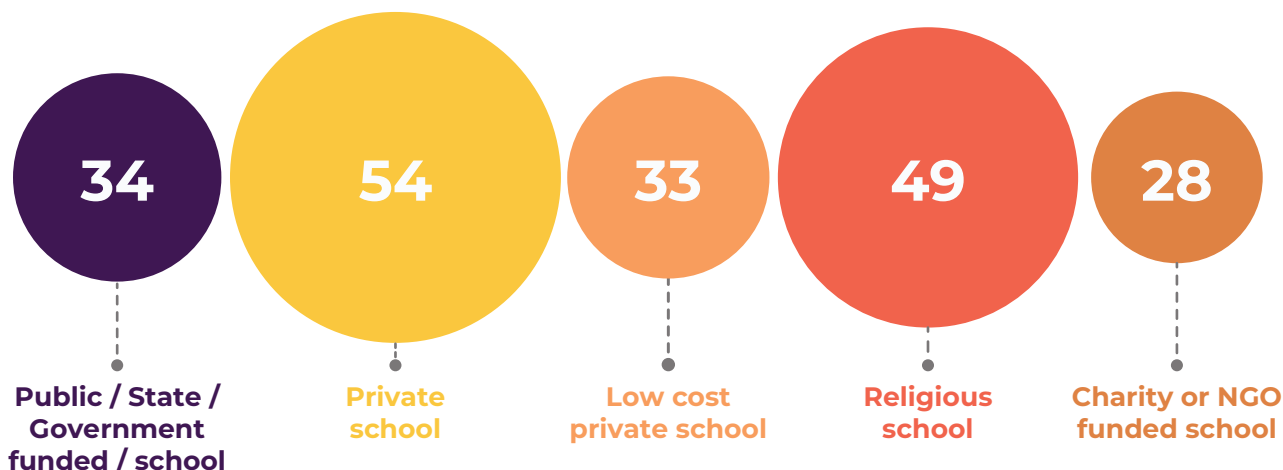
2.2.2 Teachers in city and urban schools were most likely to use messaging services to contact both students (66%, versus 60% in rural schools) and parents (57% versus 53%). Contacting parents by telephone was highest in rural schools, but only marginally so. Teachers in rural schools were also most likely to make printed copies of digital resources to distribute to their students but, again, the difference was not large: 50% of rural school teachers did so, compared with 45% in urban schools and 43% of teachers in schools in semi-dense areas.

2.2.3 Much starker differences were found with teaching classes online, reflecting the availability of internet access and, most probably, its quality too. In city and metropolitan schools 56% of teachers taught classes online, falling to 48% in schools in sub-urban settings and just 33% in rural schools, a gap of 23 percentage points. Teachers in urban schools were also much more likely to use a school learning platform such as Moodle, Blackboard or Google Classroom to share lessons and tasks with children (47%) and to record instructional videos to support their students' learning (41%) than those in rural schools (27% used a school learning platform, 28%

¹³ <https://www.oecd.org/education/talis-2018-results-volume-i-1d0bc92a-en.htm>

Did you do any of the following during the COVID 19 pandemic. Shown as a %



Teachers who shared lessons via the school learning platform. Shown as a %

recorded instructional videos). Understanding the impact of these differences would be interesting, and important, both from teachers' and learners' perspectives, for example to gauge the effectiveness of online classes or learning platforms compared to alternatives.

2.2.4 Type of school was a major distinguishing factor in the ways teachers used technology during the pandemic. Teachers in private schools were by far the most likely to say they taught classes online (71%). The proportions were similar among religious schools (59%) and charity/NGO-funded schools (58%) and fell to 41% among government-funded public schools and 36% for low-cost private schools. Private schools were also the most likely to offer a hybrid model in which some students were taught face-to-face and others online at the same time, and to share lessons with children by email although teachers at religious schools also did so more frequently. It would be fruitful to explore why higher proportions of teachers at religious, private, and charity/NGO schools made digital resources (audio, video) than teachers at other schools. It would

be interesting to understand why or how religious schools had greater access to such platforms, especially since teachers in religious schools reported lower relative responses on other technology-related items.

2.2.5 When examining teachers' responses to the survey on how they used technology there was a general trend across a number of items of a correlation between higher responses and longer teaching experience. These items were more focused on pedagogy and teaching. For example, respondents most likely to say they taught classes online were those with 21-30 years' teaching experience (55%), followed by those who had taught for more than 30 years (52%) and those who had taught for between 11 and 20 years (50%). This was lower among teachers with between 6 and 10 years' experience (45%) and markedly so among newer teachers with between 3 and 5 years' teaching (38%) and 2 years or fewer (39%).

2.2.6 Similar broad patterns were recorded for teaching students online and face-to-face at the same time, sharing lessons and tasks with children using a school learning platform, recording instructional videos to share with students, making audio-recordings to share with students, and contacting parents and carers via email. Some of these could reflect differences in creativity or confidence. It would be interesting to delve more deeply into this pattern to find out why teachers with greater experience were providing more online classes than less experienced colleagues. It is likely that well-designed training and professional development

for newer teachers could help to address gaps here.

2.2.7 Conversely, there was a correlation between less experience and higher responses from participants saying they made printed copies of digital resources to share with learners. This could reflect teachers with shorter classroom experience finding less creative solutions than more imaginative initiatives, such as using technology to create audio or video resources for children. Again, this makes a case for targeted training for less experienced (or confident) teachers if this is the case.



MEET THE TEACHER

Rjay Calaguas, urban school, Philippines

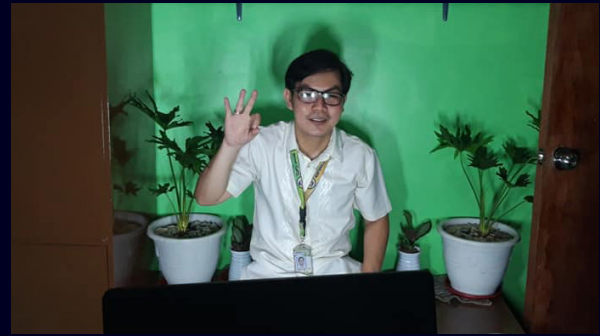
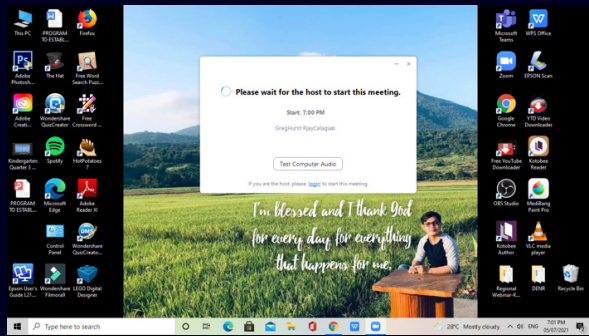
Producing short video lessons and distributing them through a social media group became an essential part of teaching for Rjay Calaguas during the pandemic. He taught himself video editing skills from free online tutorials and for an entire school year made three short films a week.

His videos were highly successful, based on feedback from his pupils and their parents, he says. But training himself to produce them was, he admits, a challenge.

Mr Calaguas, 31, is a kindergarten teacher at Northville 15 Integrated School, a government-funded school in Angelas City in Pampanga, a central province in the Philippines. He teaches two classes of children aged between four and six, each with 29 pupils.

Children were offered modular distance learning for the whole 2020-21 school year, with modules distributed to their parents.

To support them, Mr Calaguas began filming videos of between 5 and 10 minutes in length to supplement lessons such as counting from one to 20 and learning basic shapes, parts of the body, the planets, and the animal kingdom. He uploaded these to YouTube and shared links with parents in a Facebook group.



“During the first months it was very challenging,” he says. “Eventually it became easier for me because I am used to producing video lessons. Facebook is very important so we can communicate with our parents easily.”

The city government provided free webinars and training for its teachers and he taught himself to use video editing software using online tutorials on YouTube and how to change the background to videos.

One difficulty was lack of internet access among some parents, many of whom are poor with the majority not owning a laptop or smartphone. The city provided free wi-fi for two hours a day and tablets for many low-income families, although some pupils whose parents were out at work had to wait until they had enough data to watch the videos.

The response, he says, has been very positive. In meetings with children and their parents via Zoom or Google Meet, both say they enjoy the videos. As a result, he believes the children have kept up with their learning.

“According to their responses to our modules they have continued to learn because they write of their experiences. Also, I am always asking them if they understand or understood the video lessons. It is a big difference if you see the teacher on the screen compared to only using the module.”

He believes he is a better teacher thanks to this experience.

“I learned a lot from using the technology so I can serve our learners more despite the pandemic. I love teaching.”

3. Technology priorities for schools

Schools' encouragement of digital resources

3.1.1 A high proportion (88%) of teachers who took part in the survey said they were encouraged by their school to use digital resources for lesson planning and teaching during the pandemic. There was much less variation on this point among teachers in different locations, with a range of answers of 5 percentage points. Teachers at charity/NGO-funded schools (94%) were most likely to say they were encouraged to use digital resources for lesson planning and teaching during the previous 12 months.

3.1.2 Private school teachers ranked second (92%) and teachers at government-funded public schools ranked third highest (87%), just ahead of those at religious schools (86%). Low-cost private school teachers (76%) were the least likely to say they were encouraged to use digital resources, with a gap of 18 percentage points below teachers at conventional private schools.

3.1.3 It would be interesting to explore why charity/NGO-funded schools ranked highest. For instance, this could be due to stronger external influence, different approaches to teaching and learning or in decision-making processes, such as a greater propensity to be flexible and iterate. The high proportion of teachers at government-funded

schools who were encouraged to use digital resources for lesson planning and teaching is positive, especially considering the large number of respondents from this demographic (72% of responses).

3.1.4 The discrepancy between low-cost private and other schools is a concern for teachers and children at such institutions and for their parents. It is important to understand why low-cost private schools rank lowest. For instance, why, relative to government or private schools, were teachers encouraged to use digital resources less? Many are located in rural areas where there is less infrastructure, which is likely to be among the potential reasons.

3.1.5 But the essence of such schools' appeal to parents in offering a low-cost education may mean that many struggle with the baseline costs for using technology to support teaching and learning. Alam and Tiwari (2021)¹⁴ have discussed the challenges experienced by many low-cost private schools during the pandemic, when thousands were shut down and many experienced difficulties with providing remote learning support to their students, and the subsequent likelihood of extensive learning losses among returning students.

3.1.6 The more experience that teachers had in the classroom, the less likely they were to say that their school encouraged them to use a digital resource of any kind for lesson planning and teaching.

14 "https://www.unicef.org/globalinsight/media/1581/file/UNICEF_Global_Insight_Implications_covid-19_Low-cost_Private_Schools_2021.pdf"

The proportion who answered yes to this question was lowest among teachers with more than 30 years' experience (83%), followed by teachers of 21 to 30 years' standing (86%), then those who had been teaching for between 11 and 20 years (87%) and for between 6 and 10 years (88%). The figure was highest among teachers with 5 years or less experience (91%). Ignoring the group with more than 30 years' experience, who represented the lowest number of survey respondents, the difference between more and less experienced teachers was 5 percentage points.

3.1.7 It is interesting to consider why less experienced teachers were more encouraged to use digital resources and vice versa. It is commonly assumed that younger teachers from the 'digital first' generation are on average more likely than older teachers to be comfortable and experienced in using technology. We have seen from previous answers that teachers with greater experience were in fact more, not less, likely to use technology for teaching, such as by teaching lessons online, sharing tasks and resources via an online learning platform and recording instructional videos for students. This would be surprising in and of itself unless this was linked to skill and confidence in teaching acquired by experience, and consequently in adapting practice to accommodate new tools and approaches.

3.1.8 It is not clear whether less experienced teachers were encouraged to use digital resources

because they were not already doing so or whether principals or other school leaders assumed that they would have greater competency with technology. It is also interesting to consider what differing levels of school encouragement to use digital resources mean for different teachers. For instance, would more experienced teachers prefer more encouragement to use digital resources? And would receiving encouragement from their school make teachers more comfortable asking for assistance or training in using technology for teaching and learning or to support students' education more broadly?

There would be further merit in exploring potential benefits to children's learning if schools consult teachers or their representatives about the deployment of technology. A Covid-19 teacher unions survey Colclough (2020)¹⁵ found that, while 75% of respondents reported that digital technologies had been introduced in their countries due to the Covid-19 school closures, 45% of unions had not been consulted on the adoption of these new tools. A further 29% of unions reported having been consulted on only a few aspects of the introduction of digital technologies in education in their countries.

3.1.9 There was little variation in school encouragement to use digital resources among teachers of different curriculum subjects with a difference of only 4 percentage points, which is a positive finding. It is important to understand

15 https://issuu.com/educationinternational/docs/2020_ei_research_teachingwithtech_eng

teachers' relative experiences in sourcing, using and adapting digital resources across different subjects. For instance, was effective training and support available or used throughout the period for different curriculum subjects?

3.1.10 Across global regions there was, however, a substantial disparity in the encouragement received by teachers to use digital resources. Teachers in Sub-Saharan Africa were least likely to do so (74%) compared to counterparts in the East Asia & Pacific region (96%), the highest ranked region. This gap of 22 percentage points is wide. The third lowest figure was reported by teachers in the Latin America & Caribbean (80%) region, which is another region with several LMICs. Surprisingly, however, the Europe & Central Asia region (78%) ranked second lowest. However, we know from other studies that within-region variation is often even greater than between-region differences; within-country technology access is likewise very varied. Differentiating between Western European countries and those in Eastern Europe and Central Asia, for instance, would be needed in order to assess whether there are significant structural differences between countries, for example between the United Kingdom and Romania or Turkmenistan, along with income-levels within the region. What's more, we know that there exist significant differences within each country; thus there are several levels of analysis needed to dig deep into the data. This survey compares regional statistics.

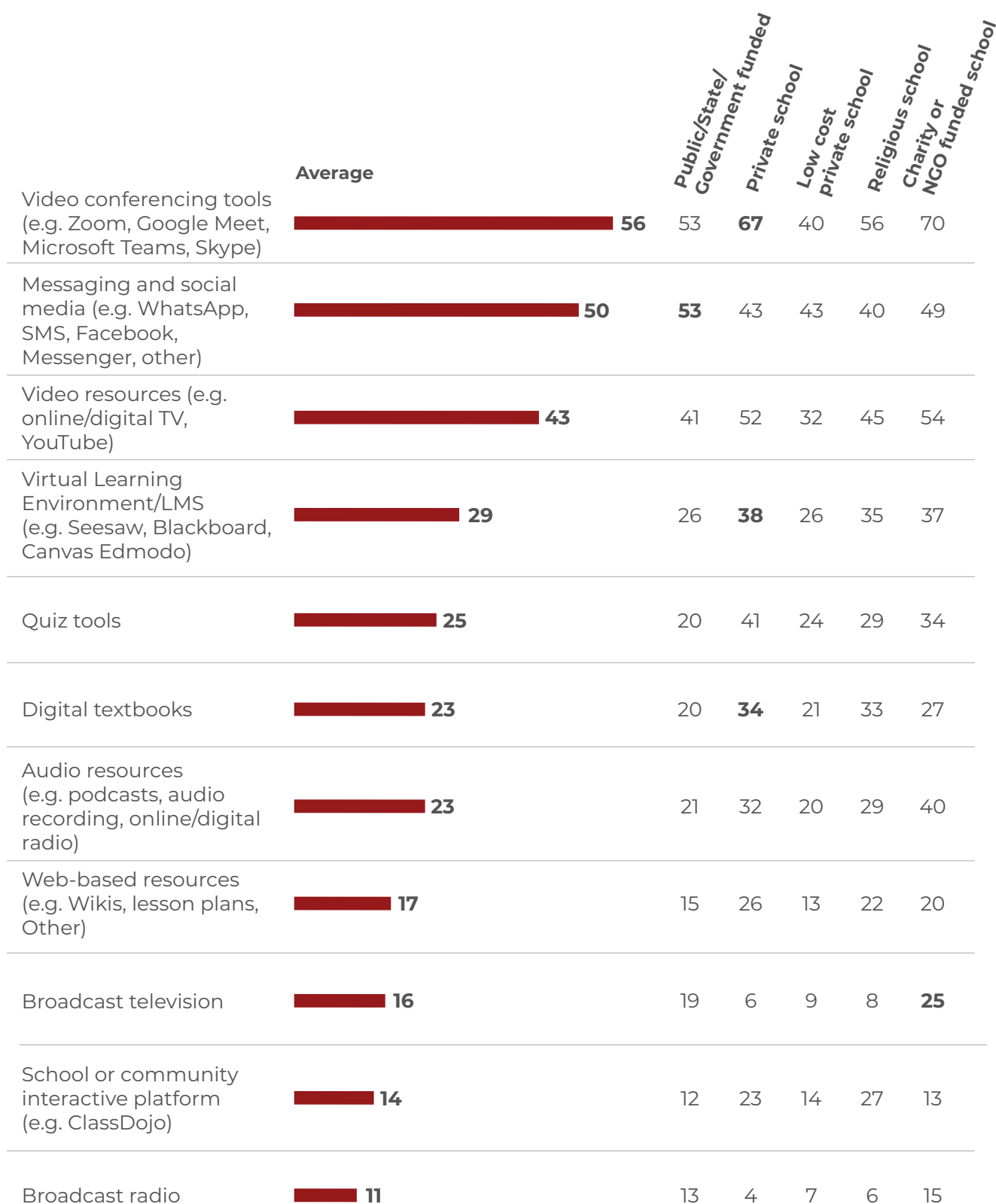
Digital resources favoured by schools

3.2.1 Video conferencing tools were the type of digital resources that teachers were most encouraged by their schools to use (56%), followed by messaging services and social media (50%) and other video resources (43%).

Other than these three, school encouragement to use technology was relatively low. Around a quarter of respondents said they were asked to use alternatives for face-to-face teaching and learning: quiz tools (25%), audio resources (23%), digital textbooks (23%) and web-based resources (17%). Similarly, the proportion of teachers asked to use digital learning platforms was relatively low: 29% said they were encouraged to use virtual learning environments and 14% to use other school or community interactive platforms.

3.2.2 These figures appear low when compared to the proportion of participating teachers who said they were encouraged to use digital resources (global = 88%). This raises concern around the digital and non-digital resources that teachers were able to access and what impact this had on learners. Is this due to schools encouraging digital resource use, yet not specifying what type of resource nor providing training? Further examination is needed to ascertain what factors were involved in cases where teachers were not encouraged to use digital resources. For example, was this caused by a lack of technology infrastructure or by a lack of training, for school leaders or district education officials and

Which digital resources did your school encourage you to use? Shown as a %



also for teachers? The relatively low use of digital learning platforms in particular stands out. Such platforms offer the potential to combine various digital elements, such as using technology for communication and/or resources, in a central space. This would appear to be an area for development that can materially assist teachers and their students.

3.2.3 While schools encouraging technology for communication ranked the highest in this list (both video conferencing and messaging or social media), only half of the total respondents selected these. Generally, educational TV and radio would be transmitted by governments or larger scale operators and not schools. This question captures both whether schools encouraged students to engage in this educational programming, and/or encouraged teachers to help facilitate these types of study during remote learning. This could happen, for example, if a teacher were to facilitate a small group session out of school using an educational radio or TV programme as the learning stimulus (Damani & Mitchell, 2020)¹⁶. When schools are open, broadcast media can also be used in the classroom to aid teaching and learning (e.g. co-viewing Sesame Street and facilitating a discussion whilst watching, e.g. Watson & McIntyre, 2020)¹⁷.

3.2.4 Using broadcast media was among the least actively

encouraged items: 16% replied that they were expected to use television as a means of communication while 11% were encouraged to use radio. This raises concerns over the extent to which teachers were able to communicate with learners and their parents throughout the pandemic. In cases where communication was not possible or difficult, what could schools, districts and governments have done differently? Understanding the low levels of encouragement by schools to use broadcast media is also important, given the widespread use of such media by public authorities throughout the pandemic.

3.2.5 During the pandemic, UNICEF urged schools to strengthen communication with parents both to ensure that they continued to feel engaged in their children's education and more broadly as a means of addressing fears and misunderstandings linked to Covid-19 and of strengthening community resolve UNICEF, (2020)¹⁸. UNICEF advised schools to prioritise two-way communication to ensure that there was space to listen to parents' and caregivers' concerns, feedback, myths and rumours about Covid-19 and to communicate information about the virus. It urged schools not to rely on a single method of communication and said it was essential to use a variety of strategies and to tailor these to the needs of families and their circumstances.

¹⁶ "<https://edtechhub.org/rapid-evidence-review-radio/>"

¹⁷ "<https://docs.edtechhub.org/lib/BVXSZ7G4>"

¹⁸ "<https://www.unicef.org/romania/stories/tips-schools-how-strengthen-communication-parentscaregivers>"

3.2.6 Government schools were most likely to encourage teachers to use broadcast media and messaging and social media during the pandemic, perhaps reflecting centralised control over educational broadcast programming as well as a wish by governments and regional authorities to disseminate Covid-related information. Were other schools less interested in encouraging broadcast media and, if so, why? For instance, was broadcast media managed and promoted by actors or programmes beyond teachers' remit? Teachers in the East Asia & Pacific region were encouraged to use broadcast media notably more than teachers in the rest of the regions (10 percentage points more than the second ranked region for television, 13 percentage points more than the next highest for radio).

3.2.7 Teachers in city and metropolitan schools were generally encouraged to use digital resources more than those in rural areas or in towns and suburbs. This was particularly so for encouragement to use video conferencing tools: 62% of urban schools did so, compared with 53% in schools in semi-dense areas and 48% in rural schools. This gap of 14 percentage points is stark. It cannot be explained by internet access, as the differences by school location were less for the use of other digital tools.

There were also gaps between urban and rural schools of 10 percentage points for encouragement to use quiz tools and of 8 points to use both virtual learning environments and

video resources. It is important to consider the contributing factors, and their extent, in the differences around school encouragement between rural/semi-dense/urban areas. For instance, this could be due to digital resource availability or school culture or awareness. Education authorities should reflect on how schools can be supported to encourage teachers to use digital tools when these would benefit children's learning.

3.2.8 Again, private schools and schools run by charities or NGOs were much more likely to encourage teachers to use more advanced technology. There was a range of 30 percentage points between the encouragement of video conferencing tools in charity/NGO schools (70%) and in low-cost private schools (40%), although this is more likely to be related to their access to technology than to school choices.

Private and charity/NGO schools ranked highest in their encouragement to use digital resources such as virtual learning environments, quiz tools, audio resources, digital textbooks, web-based resources, while government-funded and low-cost private schools ranked low. This suggests that, broadly speaking, the type of school a teacher works at does have a bearing on the encouragement they received to use specific digital tools. Low-cost private schools ranked low across multiple items. Again, this finding is worrying for teachers and children from such schools and their parents and poses the question of what is the added value, if any, they offer in

comparison to government schools.

3.2.9 We have seen from previous responses to the survey that teachers with greater classroom experience were less likely to say they were encouraged to use digital resources generally. When asked about specific digital tools, however, there was not a uniform pattern and the range of responses between teachers of different years' experience was narrow for many types of resources. For two types of digital resources (digital textbooks and quiz tools) this picture was reversed and teachers with more experience were more, not less, likely to say they were encouraged to use them. The strongest relationship was for digital textbooks, where the teachers' experience directly

correlated to encouragement to use these. Teachers with more than 30 years' experience were most likely to be asked to use digital textbooks (30%), followed by those who had taught for 21 to 30 years (29%), and teachers of between 11 and 20 years' standing (22%). Next came those who had taught for between 6 and 10 years (21%), 3 and 5 years (20%) and less than two years (19%). There was a broadly similar, although less pronounced, trend for using quiz tools for learning (range = 10 percentage points).



MEET THE TEACHER

Joshua Chukwu, rural school, Nigeria

When his rural primary school closed during the pandemic, learning stopped completely for the 45 children in Joshua Chukwu's class. Families of his pupils, who were aged seven and eight, did not have access to the internet. Only one parent had a digital device.

Mr Chukwu, 28, who teaches mathematics, basic science and English at Local Government Primary School 1 in Ibiade, in a remote area of Ogun State in south western Nigeria, began to telephone as many children as he could at their homes.

"I would just get them to remember some of the things I had taught and be able to do some basic literacy," he says.

He visited some children to teach them in their homes, but the distances between pupils' houses made that difficult. As an alternative, he found an open space in the compound of one of the parents.



He contacted as many of the children's families as he could, and encouraged them to bring chairs, their school books and a pen. And, under a mango tree, he created an outdoor classroom.

Three times a week 25 children in his class would come for a two-hour lesson. He used his own laptop and smartphone, sometimes playing videos to reinforce or expand their learning.

"I was able to help some of them to make progress," he says. "Because they were not of the same learning ability, some of them had to learn very elementary stuff. I saw they had issues so the lessons were differentiated. I made progress with some of them and their reading skills improved during the period."

He continued to teach in the shade of the mango tree from July to early September 2020.

When the school reopened, all but one of the children in his class returned but their learning loss was acute, especially among children who did not attend his outdoor classroom.

"I saw that some had really not been learning," he says. "Many of them had even forgotten most of the things they had learnt. I had to take the lessons in a calm way and help them to refresh their memories. So, revision was done for a few weeks before normal teaching began."

"They really missed out on some things – five months in the life of a child in a rural community not learning is so much."

During this period, Mr Chukwu completed several training courses via his smartphone, on growth mindset for teachers, designing graphics, video editing and creating video animation, all of which he paid for himself.

The experience, he says, made him still more determined in his career as a teacher.

"I have been inspired by seeing what the children in those communities go through, he says, "inspired to want to help them even more and want to impact children across their learning."

More than half of participating teachers reported that their school's capacity to provide quality instruction for children was hindered by both insufficient internet access and by a shortage or inadequacy of digital technology for teaching and learning.

4. Limitations of technology

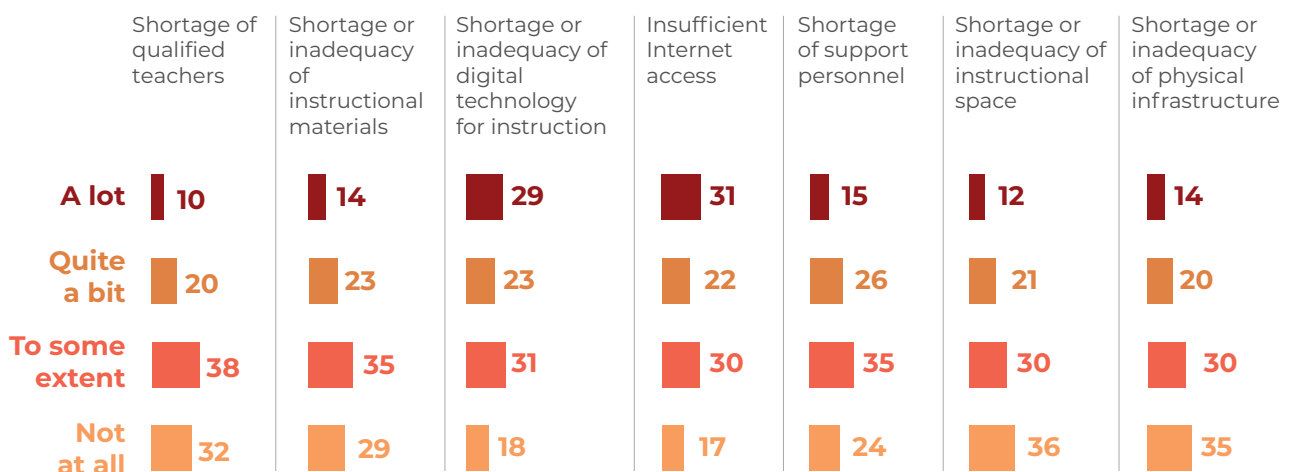
What held schools back?

4.1.1 More than half of participating teachers reported that their school's capacity to provide quality instruction for children was hindered by both insufficient internet access and by a shortage or inadequacy of digital technology for teaching and learning. Almost a third of teachers said their school was held back a lot or quite a bit by all of the issues listed, namely poor quality or a lack of teaching materials, not enough space for teaching in classrooms or elsewhere, inadequate physical infrastructure, and shortages of both qualified teachers and support staff.

4.1.2 Respondents were also asked to indicate if any or all of these factors limited their school's capacity to provide a good standard of instruction to some extent: a substantial proportion of teachers said that this was the case. These are concerning statistics. To understand how teachers can voice these issues, it would be important to understand the mechanisms that teachers have available to report and discuss issues at different levels, for example within their school, and at district or government level.

4.1.3 The two items with the largest proportions which teachers said limited their school's capacity quite a bit and a lot were the only technology-related items on the list: insufficient internet access (53%) and shortage or inadequacy of digital technology for instruction

To what extent is your school's capacity to provide quality instruction currently hindered by any of the following issues? Shown as a %



(52%). Both produced substantially larger responses than the rest. The third highest was a shortage of support personnel (41%). It should be noted that responses could be skewed by selection bias, in that teachers undertaking the survey were likely to have more of an interest in technology and therefore technology-related issues could be more of a concern to them.

4.1.4 The level of concern about insufficient internet access is high when considering that 78% of respondents said their school has access to the internet. This could be due to the fact that, even if the internet is available, it is often not of sufficient quality to support the provision of instruction making full use of digital resources.

4.1.5 With regard to shortages or inadequacy of digital resources, 42% of teachers said they had to bring their own computer into school. Again, this is highly concerning and not a reasonable expectation of teachers. Among respondents to the survey, 29% of teachers said that there was only one computer, laptop or tablet for the entire school and 16% said that students had to bring their own device with them to classes. Another 14% said their school had one computer, laptop or tablet for each class. Just 24% of teachers said their school had multiple computers for each class and 14% said that their school had one computer, laptop, tablet or mobile device for each teacher.

4.1.6 As reflected throughout the survey, teachers in rural schools tended to report greater problems with technology than their

counterparts in urban schools, with a gap of 14 percentage points on whether insufficient internet access hindered their school a lot or quite a bit (61% versus 47%) and of 13 percentage points when asked if a shortage or inadequacy of digital resources held back their school a lot or quite a bit (59% versus 46%). It would be interesting to compare the extent to which these differences are explained by school type. For instance, do schools in urban areas generally experience fewer issues because a higher proportion of private schools are located in these areas? How do private schools in rural areas differ from those in urban areas? These nuances would be important to explore to help distinguish to the extent to which location or school type impacts a school's capacity in these ways.

4.1.7 Technology-related issues including insufficient internet access and shortage or inadequacy of digital technology for instruction were considerable hindrances for teachers at 58% and 60% of government and low-cost private schools respectively, who said these hindered their school's capacity a lot or quite a bit. These responses are high and add to the case for increased investment and support in these resources at such schools. Teachers at low-cost private schools reported the



Lack of access to the internet or to digital technology linked to learning thus emerged in the pandemic as a key 'digital divide' in educational inequality, overtaking several areas of need long associated with lower outcomes for schoolchildren.

most concern across the majority of issues relative to other schools. In private schools, teachers reported substantially fewer issues with technology-related factors than teachers at other schools. Again, this is seen with charity/NGO schools to a lesser extent.

4.1.8 Teachers in the Middle East & North Africa reported the fewest obstacles to their schools' capacity. It is perhaps surprising that they encountered fewer challenges than teachers in both North America and in the combined region of Europe & Central Asia, which are overall more affluent regions. Also surprising were responses of "not at all" from teachers in South Asia, which were also relatively high. The greatest proportion of hindering factors limiting the quality of instruction provided was reported by teachers at schools in Sub-Saharan Africa.

Learning loss

4.2.1 When asked which groups of children experienced more learning loss than others during the pandemic, the most frequent response, cited by 60% of participating teachers, was that pupils with less access to the internet or technology fared the worst. This ranked 4 percentage points above students from the poorest households (56%), 13 points higher than children whose

families faced financial difficulty or unemployment due to Covid-19 and 16 percentage points above parents who were unable to support their children in their lessons outside school, for example because they were working.

4.2.2 These ranked well above other categories of need commonly associated with lower achievement in school. A third of teachers (33%) said greater learning loss was experienced by children with lower levels of attainment prior to the pandemic and students from unstable home backgrounds, while 30% said pupils whose education suffered most were those with physical disabilities, learning difficulties or other special needs. Other groups less likely to be identified by teachers as experiencing learning loss were children whose families experienced illness or bereavement due to Covid-19 (29%), those who had been displaced from their home (25%), students who were classed as vulnerable or having other needs or special requirements (24%) and children whose mother tongue was not the language in which they were instructed (20%).

4.2.3 Lack of access to the internet or to digital technology linked to learning thus emerged in the pandemic as a key 'digital divide' in educational inequality, overtaking

One notable finding was how relatively few teachers reported that girls experienced more learning loss than boys linked to remote teaching: just one in six (16%) said this was the case. Even fewer (14%) said parents prioritised boys' learning over girls' during Covid-19 lockdowns.

several areas of need long associated with lower outcomes for schoolchildren. Another key element to this divide was that widespread school closures and a switch to remote learning in response to Covid-19 placed greater emphasis on parents in supporting their children's instruction themselves and facilitating their learning, rather than offering more general support, stability or financial contributions to their education.

4.2.4 Prior literature has shown that parents are concerned about their lack of content and pedagogical knowledge, and may struggle to fulfil students' educational needs (Garbe et al., 2020 ¹⁹; Ingram et al., 2007 ²⁰); lack of time and energy exacerbates the situation (Hoover-Dempsey et al., 2005 ²¹). This interacts with socio-economic status; low socio-economic status families can be less involved with home learning; they may even be deliberately, or at least subconsciously, excluded from involvement in children's learning (Wu et al., 2017 ²²).

4.2.5 Teachers' awareness of higher learning loss among children whose parents were unable to support their lessons at home illustrates the importance of teachers communicating with families during the pandemic, explored in other questions in the survey. It would be interesting to examine further whether teachers felt they were able to offer appropriate communication to students and their parents to mitigate this issue.

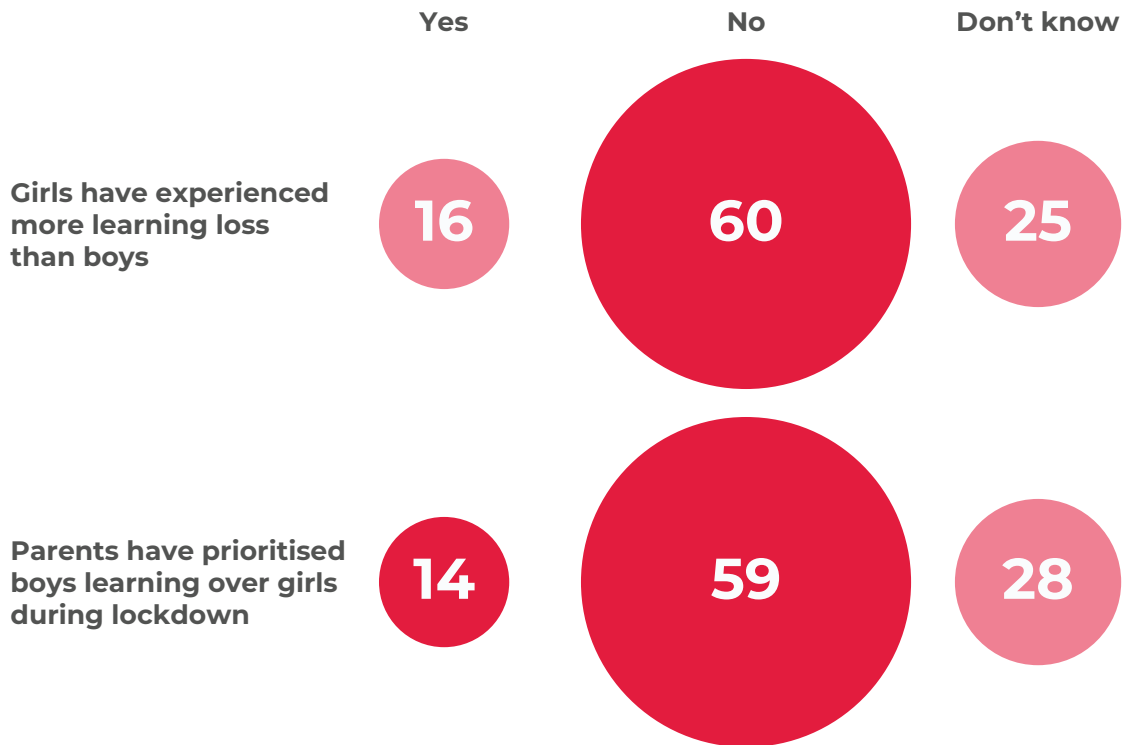
4.2.6 One notable finding was how relatively few teachers reported that girls experienced more learning loss than boys linked to remote teaching: just one in six (16%) said this was the case. Even fewer (14%) said parents prioritised boys' learning over girls' during Covid-19 lockdowns. These figures are still unacceptably high. Discrimination against girls to limit their educational (and social) opportunities entrenches inequality and poverty. We know this happens in many parts of the world, however, and we might have expected these figures to be higher during a prolonged period in which most learning transferred from school to home environments,

19 Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). COVID-19 and remote learning: Experiences of parents with children during the pandemic. *American Journal of Qualitative Research*, 4(3), 45-65.

20 "<https://www.ajqr.org/article/parents-experiences-with-remote-education-during-covid-19-school-closures-8471>"

21 "<https://www.journals.uchicago.edu/doi/10.1086/499194>"

22 Wu, C., Zhang, J., & Wang, M. (2017). What has hindered parents' participation in children's education?. *Educational Research*, (1), 85-94.

In your experience are any of the following true? Shown as a %

where we know such discrimination stems from.

4.2.7 It would be interesting, and important, to compare these responses to other evidence around the different impacts of the pandemic on girls and boys. This could help identify how aligned teachers' perspectives are with other evidence. It could also be used to evaluate tools and other factors, such as assessment or communication with parents. For example, if teachers feel that girls aren't experiencing less learning than boys, it could represent an issue with the assessment process. A substantial proportion (25% and 28% respectively) said they did not know the answer to either question. Providing necessary support in these areas is important to ensure that teachers understand learners' progress and needs. We must assume, though,

that teachers would have been aware had adverse learning loss or discriminatory access been demonstrably the case among girls in their classes. Whilst there are a plethora of contextual factors that could impact this analysis that require deeper investigation, these headline findings hold out hope that digital learning tools can play a role in offering equitable access to education for girls. This applies even when they are studying at home rather than in a classroom, which ought to be a more egalitarian environment.

4.2.8 Teachers in religious schools (52%) and government-funded public schools (46%) had the highest responses on learning loss among children whose parents were unable to support their lessons at home. Interestingly, both figures were above the share of teachers at low-cost private schools

(43%) who linked weak parental support to children falling behind in their lessons. The proportion for charity/NGO schools (39%) was only just ahead of that at traditional private schools (38%).

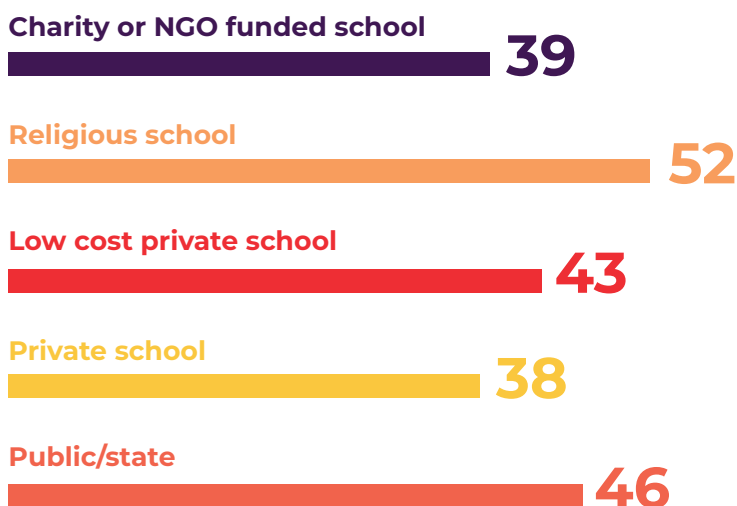
4.2.9 Where learning loss was noted, it manifested in multiple ways. When teachers who said some or none of their students progressed their learning over the past year were asked to choose from a list how their children had been affected, options spanning literacy and numeracy, motivation and discipline and self-confidence all received a generally similar share of responses. Difficulty in paying attention (78%) was the most common, followed by poorer literacy (76%), less motivation (76%), lost interpersonal and communication skills (74%), making less or no contribution to lessons (71%), poorer numeracy (71%) and lost confidence (65%). A significant point here is that two thirds of teachers selected all the items. Understanding how teachers and technology-related professional development for teachers can work

towards mitigating the issues here is important. For instance, how can teachers be best supported in addressing the highest and second highest ranked items relating to learner attention and self-discipline/motivation respectively?

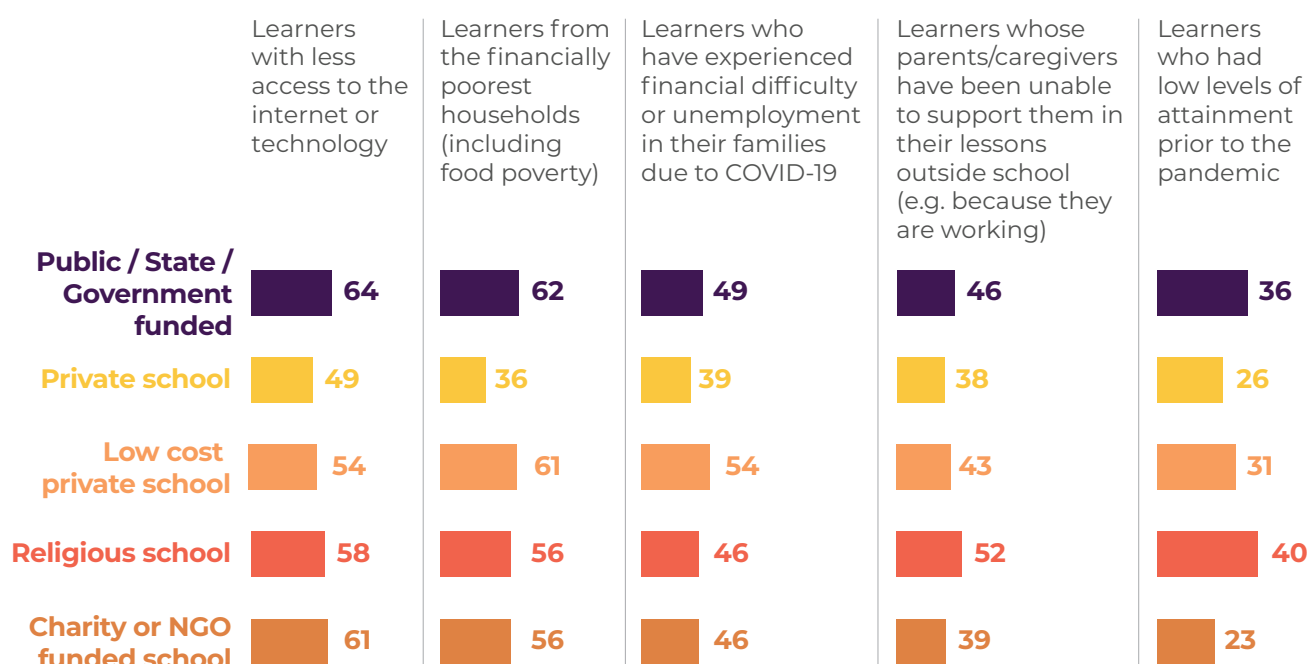
4.2.10 There was little variation in groups of children who most experienced learning loss in urban and rural schools other than on two items. Teachers in rural schools reported that children whose families experienced financial difficulty or unemployment due to the coronavirus pandemic were much more likely (46%) to fall behind in their learning than was the case in city or metropolitan schools (33%), a gap of 13 percentage points. This is perhaps due to greater employment opportunities and salaries in urban areas generally.

4.2.11 On the other hand, teachers in rural schools were significantly less likely to say that their students experienced learning loss because of illness or bereavement in their family linked to the pandemic (23%)

Learners whose parents/caregivers who have been unable to support them with their learning outside of school. Shown as a %



Have any of these groups of learners experienced more learning loss than other students? By school type. Shown as a %



than teachers in urban schools (33%). This probably reflects higher transmission rates of the virus in more densely populated areas. Another notable finding was that teachers in schools in suburbs and semi-dense areas were most likely to report learning loss during the pandemic among children from unstable home backgrounds (38%). This was higher than teachers in metropolitan schools (32%) and rural schools (31%).

4.2.12 Reports of learning loss differed significantly between types of school. Teachers at private schools reported lower rates of negative impacts on children's learning due to the pandemic across almost all groups of children, while those in government and low-cost private schools tended to have the highest responses to items. This was most extreme for children of lower socio-economic status, with just 36% of teachers at

private schools reporting learning loss among children from the poorest families compared to 56% at both religious and charity/NGO schools, 61% at low-cost private schools and 62% at government-funded public schools. Among children with less access to the internet or to technology, 49% of private school teachers said such students fell behind in their education. Rather surprisingly, the next lowest response was among teachers at low-cost private schools (54%). This was followed by teachers at religious schools (58%), at charity/NGO schools (61%) and at government-funded public schools (64%).

4.2.13 Teachers at schools in the East Asia & Pacific region reported the highest responses for students experiencing learning loss, including access to technology and the internet. This could reflect greater connection to communities

generally in this region and therefore more awareness of differences in learning across groups. Similarly, in responding to questions about remote learning choices, teachers from the East Asia & Pacific region ranked highly on their use of technology for communication with parents and carers.

5. Teacher professional development and technology

Duration of development and training

5.1.1 Teachers engaged in substantial amounts of professional development and training (from here on, PD) during the pandemic, during a period when many educators were working remotely or in a hybrid style. When asked how much time in total they spent on their PD during the previous 12 months, 42% said more than 10 whole days. Another 11% said they undertook between 6 and 10 days, 17% said between 4 and 5 whole days and 16% said they spent 2 or 3 days.

5.1.2 That more than 4 in 10 teachers engaged in PD for more than 10 whole days is a high proportion, larger than expected, and is very encouraging to see. Note that PD was defined for the purposes of the survey to capture both formal programmes and informal learning (e.g. through peer communities). This may have contributed to the high proportions

of teachers selecting more than 10 days. It would be interesting to note the number of days teachers accessed formal learning opportunities versus informal ones. It is also likely that more PD was offered by schools or education authorities and governments than usual, in order to support remote teaching which many teachers will have previously been unfamiliar with.

5.1.3 Almost half of teachers' training lasted 5 whole days or less. The average duration of teachers' training and professional development across OECD countries is 62 hours annually (Henshaw, 2021)²³. Assuming a whole day of training is approximately 7 hours, a large proportion of respondents (at least 42%) will have surpassed the OECD average in the 12 months covering the pandemic's peak.

5.1.4 There was a general trend towards teachers in more urban areas engaging in greater quantities of training. For the more than 10 whole days category the figures were 45% from urban areas, 42% from town or suburbs and 38% from rural areas. This 7 percentage point gap between those in urban and rural areas is not huge, but is telling, again demonstrating possible inequitable training and development opportunities. There was, however, little variance when analysing the other categories.



²³ <https://www.sec-ed.co.uk/news/a-35-hour-a-year-cpd-entitlement-could-stop-12-000-teachers-quitting-wellcome-education-policy-institute-retention-recruitment/>

5.1.5 Charity/NGO schools had the highest proportion (38%) of those teachers engaging in more than 10 whole days of training. The next highest were private school teachers with 32%. There is an 8 percentage point gap between private and low-cost private school teachers (the lowest at 24%). This demonstrates a significant shortfall in provision for teachers working at low-cost private schools.

5.1.6 Teachers with more experience engaged in significantly greater quantities of training and professional development than less experienced teachers. For those who undertook more than 10 whole days of training, 54% were teachers with 30-plus years' experience, 53% had taught for between 21 and 30 years, 46% for 11 to 20 years and 38% for 6 to 10 years. For teachers who had been in the classroom for 5 years or less the figure was 31%. One might well have assumed the opposite to this given the expected additional support newly qualified teachers should be receiving.

5.1.7 Among science teachers and language studies teachers, 49% of teachers of both these curriculum subjects engaged in the greatest quantity of training and professional development, of more than 10 whole days. This represented a 7 percentage point difference when compared with reading, writing and literacy teachers (42%) and an 8 percentage point difference when compared with mathematics teachers (41%).

5.1.7 The fact that science and language studies teachers received more training than either reading, writing and literacy or mathematics

teachers is surprising, especially given the focus on the core importance of foundational literacy and numeracy in LMICs. Among teachers who took part in the survey, 20% were language studies teachers and 19% were science teachers, compared with 18% for mathematics and 15% reading, writing and literacy. This might account, to a degree, for the higher proportions of teachers engaging in greater quantities of professional development being science and language teachers.

5.1.8 Interestingly, the quantity of professional development that teachers engaged in varied greatly by region. Teachers from Latin America & Caribbean (63%) and from Europe & Central Asia (61%) engaged in the highest amounts (more than 10 whole days); 53% of teachers from the Middle East & North Africa region engaged in more than ten whole days, while 45% of those from South Asia did so. Around a third of teachers from sub-Saharan Africa (34%) and North America (35%) engaged in more than ten days of training. Only 28% of teachers from East Asia & Pacific engaged in more than ten days' professional development. This is a 35 percentage point difference to teachers from Latin America & Caribbean.

5.1.9 This regional variation, particularly with regards to those engaging in more than 10 whole days of teacher professional development, is striking. It denotes differences in access to training opportunities across different regions. In addition, as described elsewhere, there may be differences

What teacher development or training did you take part in over the last 12 months? Shown as a %



in how teachers from different regions defined professional development. Although a definition was given within the survey, teachers may still have gone with their own interpretations, perhaps with those selecting more than 10 whole days using the broader definition of both formal and informal learning. For the category of 6 to 10 days' training category, the range of teachers' responses was 6 percentage points, the highest category being North America (15%) and the lowest East Asia & Pacific (9%).

5.1.10 Given that teachers from the East Asia & Pacific region also had the lowest share for more than 10 whole days' training, this further corroborates the finding that teachers from this region reported lesser engagement in teacher learning.

Focus of teacher development

5.2.1 The most common focus of teachers' professional development was in using technology tools and resources for remote teaching and learning (53%), followed by pedagogies for online or remote teaching and learning (43%). Both were well ahead of the next most often cited type of training, which was teachers engaging in communities of practice with colleagues to support one another (34%). Considering the widespread global shift to remote and online learning throughout the Covid-19 pandemic, the percentages on training on understanding online student behaviour (20%) and progress monitoring during remote learning (17%) were low. This is worrying. Training in these areas can help teachers identify learning loss and how to use technology to effectively assess learning progress.

Considering the widespread global shift to remote and online learning throughout the Covid-19 pandemic, the percentages on training on understanding online student behaviour (20%) and progress monitoring during remote learning (17%) were low. This is worrying.

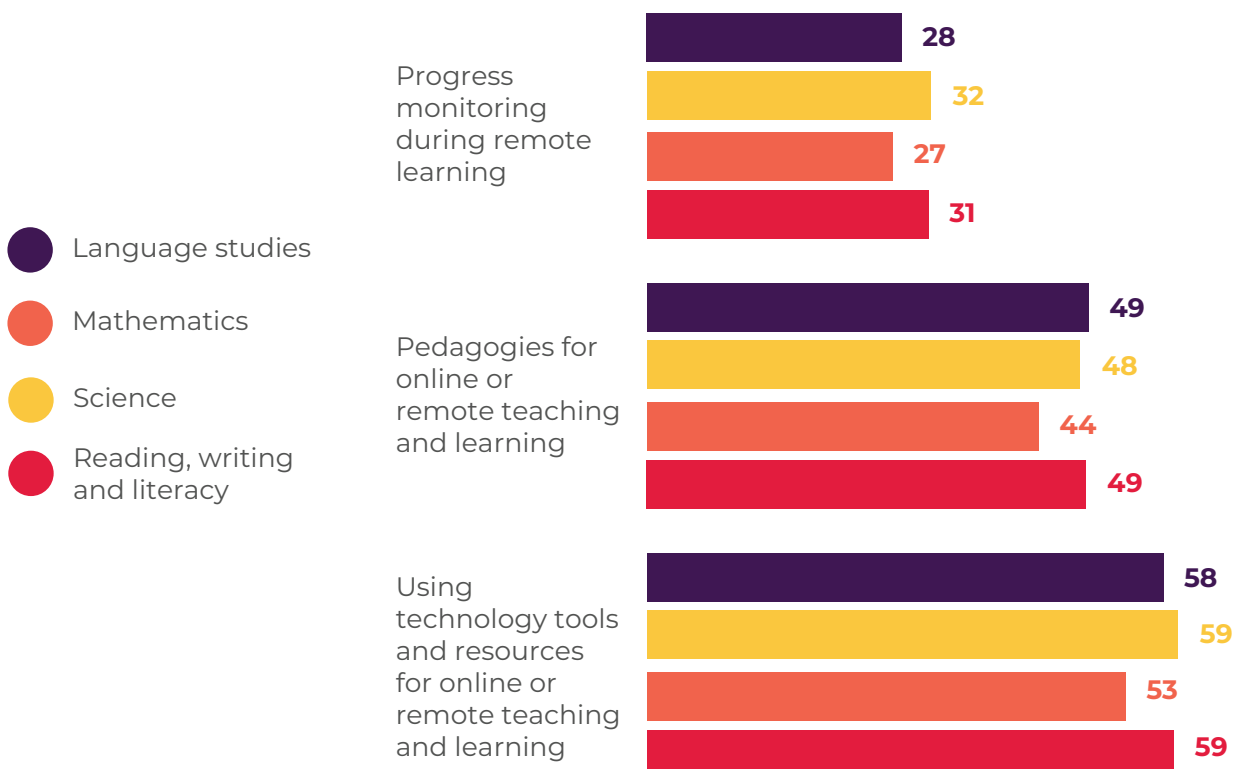
This links with the relatively lower frequency in teachers using technology for assessment highlighted elsewhere in the survey (detailed in section 2.2.4).

5.2.2 Only 33% of training and development focused on online safety for teachers, while safeguarding for children and young people online and during remote learning made up only 24% of training offered to teachers. These figures for items on online safety and safeguarding are worrying, given the risks involved when transitioning to online

learning for both teachers and students. Other survey questions found that 63% of teachers said that they used messaging services such as SMS, WhatsApp or similar platforms as the most common way of contacting their pupils during the pandemic.



You told us that you took part in teacher development or training in the last 12 months. What did it focus on? By teacher role. Shown as a %





MEET THE TEACHER

Melissa Morris, urban school, United States

For five years before the coronavirus pandemic, Melissa Morris experimented with Skype and Zoom in lessons. She was already comfortable with using video conferencing tools. But teaching remotely for more than a year forced her to take her technology skills to a new level.

Ms Morris, 49, teaches instrumental music at James Madison High School in Brooklyn, New York City, where more than 40% of teenagers are from low-income families.

The school was closed for more than a year, with all teaching taking place remotely from March 2020 to April 2021. She taught general music to some classes and upper-level guitar to others, including some who had only had six weeks of in-person guitar lessons in the previous school year.

Three days per week were allocated for whole-class teaching online. On the other two days she sent daily lessons to students and gave additional teaching and support to those who needed individual instruction.

This was a particular challenge with guitar lessons as many students were reluctant to turn on their cameras for live lessons. Instead, Ms Morris used Microsoft's Flipgrid platform to swap videos with pupils.

"I would send home an assignment: 'Play me these four measures', and because they wouldn't show me their video live, they felt more comfortable sending a video," she says.

"Now I could actually see what their hands were doing and I could respond back with a tailor-made video for that child. For example, I would be able to give directions like: 'I noticed you were using your second figure on the third fret. Can you get your third finger on the third fret? It will look like this.'"

She found it exhausting as she supplemented these videos with phone calls.

"We were up at 6.30, we were on our schedule bright and early and we didn't put down our technology until we were falling asleep with it on our lap because the parents needed support, the students needed support, which was most of the time on the phone," she says.

The experience was very different to her pre-pandemic experiments with technology when Ms Morris would organise virtual "mystery" tours and connect her classes to children and their teachers in places including Florida, Morocco and Kenya.



Then, she says, there were “no walls to their classroom, their morale was like a firecracker. It was energised, and it literally took me nothing to energise them other than to set up this meeting”.

Once there was no option other than remote learning, this all changed, she says. “It was not energising. I did not have the experience of the days prior. It was debilitating and you could see the morale sink, and sink even more to the point where you couldn’t even get them to turn on their cameras any longer.”

There are clear safeguarding risks here given the direct teacher-student interaction, especially as some messaging services use end-to-end encryption that can conceal the content of messages from parents or schools. Equally, teachers using such platforms to communicate with young people are potentially vulnerable to false accusations being made against them.

5.2.2 It is positive that charity and NGO schools had much higher training rates in these areas than all other school types: 50% gave their teachers training in online safeguarding for children and 48% in safe online behaviour for teachers. Education authorities and governments must work with school leaders to ensure that robust safeguards and supervision arrangements are in place whenever such messaging services are used by teachers and young people and that regular and

appropriate training in staying safe online is offered and taken up by teachers.

5.2.3 Just 17% of teachers’ training focused on engaging parents during remote learning. Given the high proportion of teachers who used messaging platforms to contact parents and carers during the pandemic, and the correlation between children’s learning loss and families unable to support their children during remote learning, this is puzzling. It raises questions over what teachers’ communication with parents consisted of and how training can effectively support teachers in this important area.

5.2.4 Another apparent inconsistency was that just over one third of participating teachers said their training focused on engaging in communities of practice with other teachers. Elsewhere in the survey half of teachers reported that they engaged in communities

Mathematics teachers reported the lowest proportions of training in comparison to teachers of all other curriculum subjects.

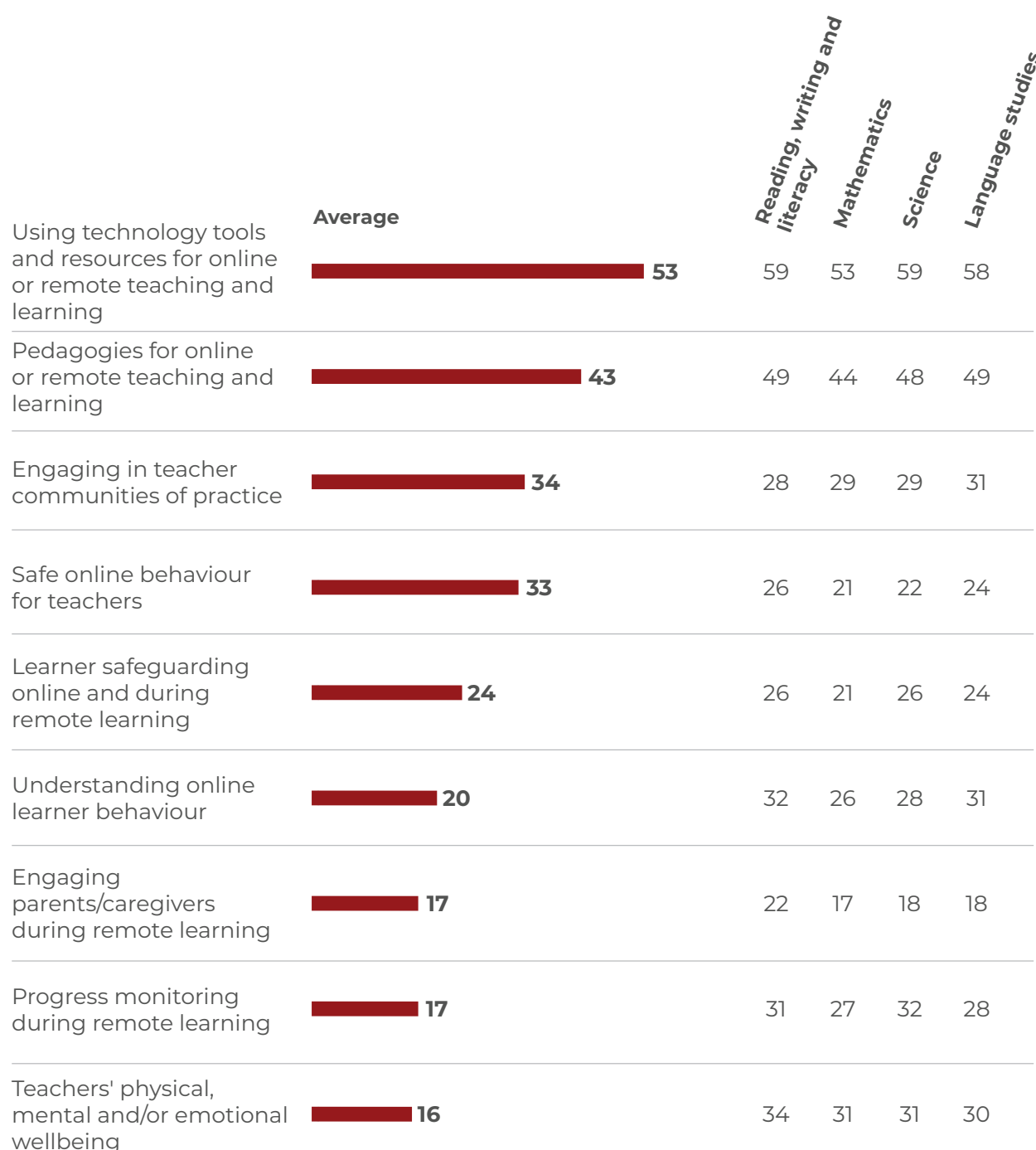
of practice either daily or weekly. For effective training and PD to take place, it must focus on what teachers are naturally doing day-to-day; in doing so, the training can enhance existing practices by adding more structure to informal processes. If a high proportion of teachers are engaging in communities of practice, training to enhance the effectiveness of these forums should reflect this. Just 16% of respondents said that their training focused on supporting teacher wellbeing, the lowest category.

5.2.5 Teachers at charity/NGO schools had the highest proportion of teachers engaging in more than ten whole days of training or development (38%). These schools also ranked highest in several types of training and were often notably higher than teacher responses from other schools: 47% for engaging parents during remote learning, which represented a gap of between 5 - 16 percentage points with other schools; and again 47% for understanding online learner behaviour, a difference of 3 - 14 percentage points difference with other schools. Low-cost private schools had the lowest share in almost all items, for instance 7 percentage points lower than other schools in training teachers to use technology for online and remote learning. Surprisingly, responses from teachers at low-cost private and government schools were often similar, and in some cases

higher, to those from private schools. Understanding how much this is a general trend as opposed to training for remote learning purposes is important.

5.2.6 Mathematics teachers reported the lowest proportions of training in comparison to teachers of all other curriculum subjects, other than in engaging in communities of practice with fellow teachers and training for wellbeing. For instance, the share of training to use technology tools for remote learning was 59% for teachers of both science and of reading, writing and literacy, 58% for language teachers and 53% for maths teachers. For training in pedagogies for online learning it was 49% for teachers of languages and reading, writing and literacy, 48% for science and 44% for maths teachers. This variance between mathematics teachers and the subject with the highest share averaged at 4.7 percentage points across all types of training. The reasoning behind why this gap exists is unclear although the survey found that maths teachers were less likely to use technology generally. This finding is surprising, however, as there are huge amounts of maths EdTech solutions available globally. Logically if teachers were using technology less, then it would be expected that they would have been more likely to have received training.

What teacher development or training did you take part in over the last 12 months? Shown as a %



5.2.7 Teachers from the East Asia & Pacific region had particularly high shares for several types of training, despite indicating in response to a separate survey question that they engaged in the least amount of PD of all the World Bank's global regions. A total of 49% of teachers at East Asia & Pacific schools undertook training

focusing on mental health and wellbeing. There was a significant gap, of 21 percentage points, to the second highest region for this type of training (North America = 28%). When compared with the region with the lowest share for this item (Europe & Central Asia = 21%), the gap increased to 28 percentage points.

...there is a potential trend around teachers or their families needing to cover work-related expenses. Such teachers should be commended for their commitment to their profession and to their students. This is, however, not a sustainable or equitable position and not a scalable way to improve educational standards.

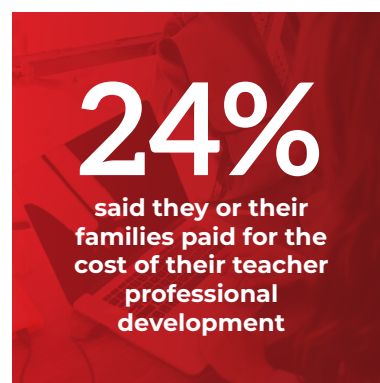
5.2.8 Furthermore, 33% of teachers from East Asia & Pacific had training on working with parents to support remote learning. There is, again, a significant gap to the second highest region (of 14 percentage points to teachers in the Middle East & North Africa, 19%). When compared with the region with the lowest share for this item (North America, 9%), the gap increased to 24 percentage points. Proportions here clustered, with only three percentage points separating the bottom three regions (North America (9%), Europe & Central Asia (10%), and Latin America & Caribbean (11%). Excluding teachers from East Asia & Pacific, shares for this category are the lowest, with all other regions having shares of either 19% or less. This is despite the fact that we know the importance of engaging parents in learning, which is the only educational intervention defined as a “great buy”. (Global Education Evidence Advisory Panel, 2020 ²⁴)

Who paid for teachers’ training?

5.3.1 Almost a quarter of teachers (24%) said they or their families paid for the cost of their teacher professional development

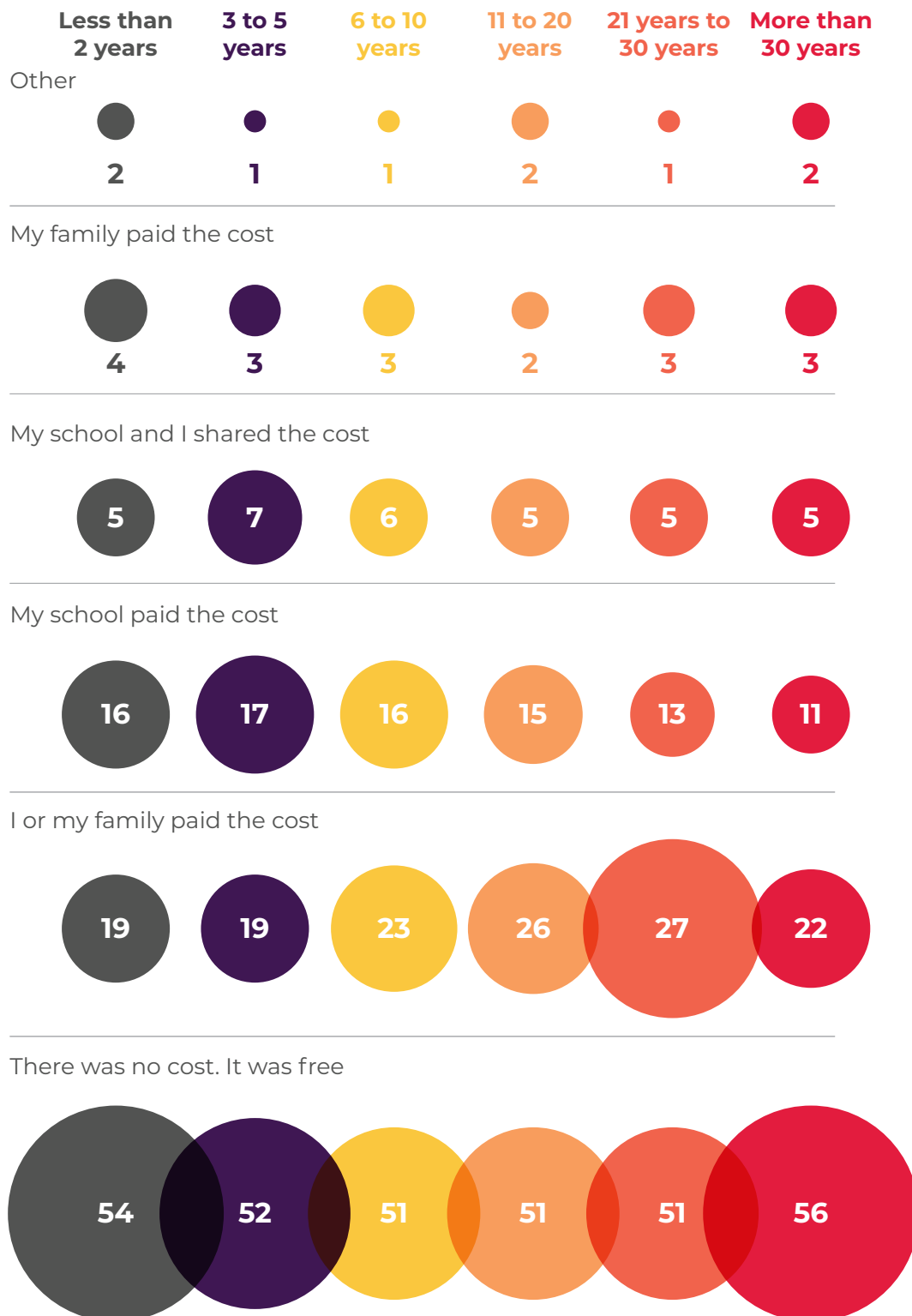
themselves during the pandemic. Another, smaller, group (6%) said they contributed towards their training, with their school also sharing these costs. It is troubling that such a sizable proportion of teachers had to cover their own PD costs, or to contribute towards these. This has the potential to negatively impact teachers’ engagement with their professional development, particularly in LMICs. These statistics also have particular implications for marginalised groups of children, their families and teachers, where inequitable training opportunities can naturally exclude these groups.

5.3.2 We have seen from answers to other survey questions that 42% of teachers need to bring their own digital devices to school. Looking at both of these questions, there is a potential trend around teachers or their families needing to cover work-related expenses. Such teachers should be commended for their commitment to their profession and to their students. This is, however, not a sustainable or equitable position and not a scalable way to improve



²⁴ “<https://documents1.worldbank.org/curated/en/719211603835247448/pdf/Cost-Effective-Approaches-to-Improve-Global-Learning-What-Does-Recent-Evidence-Tell-Us-Are-Smart-Buys-for-Improving-Learning-in-Low-and-Middle-Income-Countries.pdf>”

You told us that you took part in teacher development or training in the past 12 months. Who paid for the cost of it? Shown as a %



educational standards. We must ask why many education systems, or many private or NGO/charity schools themselves, appear not to have taken greater responsibility for their teachers' training and development. This was during a critical period when school systems across the world were placed under great strain by the switch to online learning during the pandemic. Just 15% of teachers said that their schools met the cost of their training. Education authorities and governments have an important role here, too. However, 52% of teachers said their training was free. This demonstrates that governments and schools in certain contexts have supported teachers with training opportunities throughout the pandemic. We must remember, though, that many non-profit bodies and commercial organisations, including technology companies, offer sophisticated suites of free resources and training for educators, and that public authorities are not the only providers.

5.3.3 Teachers with greater experience were more likely to say that they paid for their training and development themselves during the pandemic. This matches previous findings in the survey that more experienced teachers made greater use of digital resources for teaching and learning during the year spanning the height of global Covid-19 restrictions. Among participants who said they or their families paid the cost of their training and development during the previous year, 22% had more than 30 years' teaching experience, 27% had taught for between 21 and

30 years and 26% for 11 to 20 years. For respondents with between 6 and 10 years' teaching experience the share was 23%, while for those who had taught for 5 years or less the proportion dropped to 19%.

It is reasonable to assume that most teachers with substantial classroom experience are more likely to be better paid than colleagues who joined the profession more recently, although this will vary across contexts and may not apply to teachers in remote settings who have fewer development opportunities. More experienced teachers should therefore, in general, be better able to afford to pay training fees, although they may have greater financial responsibilities too. It should be emphasised, moreover, that the question asked whether teachers or their families paid for their own training costs.

5.3.4 Who paid for teachers' PD during the pandemic varied considerably according to their school type. More than half of teachers at low-cost private (57%) and government (54%) schools did not incur any costs when engaging with training. In contrast, 30% of religious school teachers had to pay themselves. Charity or NGO school teachers also incurred low costs: 47% said their PD was free, 26% said their schools covered the cost (the most of any school type), and only 14% reported that they had to cover the cost themselves (the least of any school type). It is notable, and perhaps surprising, that charity and NGO schools were more likely to pay for the costs of their teachers' PD than private schools (23%).

5.3.5 Teachers from East Asia & Pacific had the highest share of respondents who said that their PD over the previous year was free (58%). We know from other survey questions that teachers from this region engaged in the lowest quantity of training and development. Thus we might assume that, given training is mostly reported as free in this region, its teachers are provided with free opportunities to engage in training but that the amount is limited; as such, beyond these free opportunities, there may not be a culture of teachers finding their own PD to engage in within the East Asia & Pacific region unless they pay for it out of their own pockets. The greatest proportion of teachers who had to cover their own training costs was found in Latin America and Caribbean (36%), a 19 percentage point difference in comparison with East Asia & Pacific (17%).

Technology used in training

5.4.1 Video conferencing tools were the most common focus of PD for teachers throughout the pandemic, with 44% of teachers engaging in training on how to teach using platforms such as Microsoft Teams, Zoom and Skype. This reflects the switch to virtual or hybrid learning forced upon many teachers as many governments ordered closures of schools to stop the spread of the coronavirus. Most other types of training priorities were also focused on teaching and learning: video resources (32%), quiz tools (25%), how to use a virtual learning environment (24%), audio resources (19%), web resources (17%)

and school or community learning platforms (15%). The prevalence of training in how to use video tools for teaching and learning presents a barrier to equity: video conferencing tools are a high-tech modality, requiring good-quality bandwidth speeds. These are, therefore, less likely to be an option for teachers in schools where connectivity rates are low.

5.4.2 Messaging and social media training were relatively high areas of focus for teachers (32%). Training in broadcast media was, in contrast, the lowest ranked type (14%). The lack of training for teachers on using broadcast media is a cause for concern considering the extent to which broadcast media has been used over the twelve months of the peak of the pandemic globally. It may be that the need for training here was perceived to be less, if broadcast media are being used in transmission mode, but there are innovative, more interactive programmes now available (for example Rising on Air).

5.4.3 Teachers of mathematics reported lower levels of training of all types in comparison with teachers of other curriculum subjects. (This is consistent with their lower rates of using technology, as reported earlier.) There was, for example, a 5 percentage point gap when looking at video conferencing tools. Among maths teachers the average subject-specific training rate was 44%. For teachers of reading, writing and literacy, language studies, and science the figure was 49%. Likewise, for training to use quiz tools mathematics teachers

reported a figure of 25%, reading, writing and literacy teachers 28% languages and science teachers 30%.

5.4.4 The largest variation by curriculum subject in types of training was for audio resources, for which 24% of reading, writing and literacy teachers received training, 23% of languages teachers, 19% of science teachers and 17% of mathematics teachers. High

training rates for reading, writing and literacy teachers is consistent with previous studies focusing on audio resources when considering the subject content; in these areas, much of the curriculum content can be translated to an audio resource. This is particularly so given the importance of developing speaking and listening skills for those learning languages. An EdTech Hub rapid evidence review on radio provided similar evidence,



MEET THE TEACHER

Abhilasha Singh, Private School, UAE

It was the youngest children in her school who Abhilasha Singh worried about most when her school switched to online-only learning. And yet, it was among the teenage pupils that the impact was greatest. Their formal education was delivered well virtually, she says, but it was elements of growing up that they missed out on.

“As a principal, I can say we feel very accomplished and didn’t allow any learning loss and we took care of our children,” she says, “but I know for a fact that even though the subjects and topics were covered, other parts of the learning took a back seat.”

Ms Singh, 48, is principal of Shining Star International School in Abu Dhabi in the United Arab Emirates, a private school that teaches the Indian curriculum. Many of its pupils are the children of Indian expatriates, and some are from Africa and elsewhere in the Middle East.

In some ways, she was fortunate. Several teachers at her school had volunteered for a virtual programme to teach children at a UNHCR refugee camp in north west Kenya with Project Kakuma initiated by Koen Timmers, a finalist for the Global Teacher Prize in 2017 and 2018. They thus had experience of preparing pre-recorded lessons.

“That experience was quite handy so we transitioned very smoothly into the ‘new normal’ when the remote instruction happened,” she says.

Before the pandemic she also co-hosted a monthly TweetMeet, a Twitter conversation for teachers facilitated by Microsoft Education, where she learned about online learning tools. Ms Singh required all her 67 teachers to complete



training in two of the company's education programmes.

When schools in Abu Dhabi were instructed in March 2020 to cease face-to-face teaching and move to online learning, she was asked by the Abu Dhabi Education and Knowledge Council how many of her pupils did not have a digital device or internet access.

A survey of parents found that, of her 1,100 pupils, 34 could not access online learning; the government provided them with Chromebooks, routers and sim cards.

"I was mostly worried about the kindergarten children especially when students were coming to the school life for the first time: how would they manage online learning?", Ms Singh says.

"The senior students would not switch on their cameras and that was really challenging because the non-verbal communication, facial expressions, lighting of the eyes, some of these things are the ways that the teacher understands whether the child has understood, and how it is going with the class," she says.

"But when the camera is off, you just don't know whether the child is there or not and how the student is sitting in front of the screen. That kind of learning loss has happened, definitely."

The most commonly cited technology-related priorities were to provide training to teachers to better integrate technology into education (39%), providing more materials for marginalised learners (38%) and make available internet access and digital devices for marginalised learners (37%).

and it found that subjects which can contain more abstract concepts (e.g., mathematics and science) are more of a challenge to deliver via audio-based learning modalities such as radio (Damani & Mitchell, 2020)²⁵. It should further be noted that teaching of languages is not a core subject and so may not have been prioritised for transmission.

6. Technology: what teachers want

Priorities to address learning loss

6.1.1 When asked what governments should do to address any learning loss experienced by school children during the pandemic, more training was the most commonly chosen option. Three of the top-five ranked choices related to technology-related items. There was not, however, a clear consensus among teachers on what action should be taken. None of the 12 options were supported by more than half of participating teachers and support for several of them was relatively low.

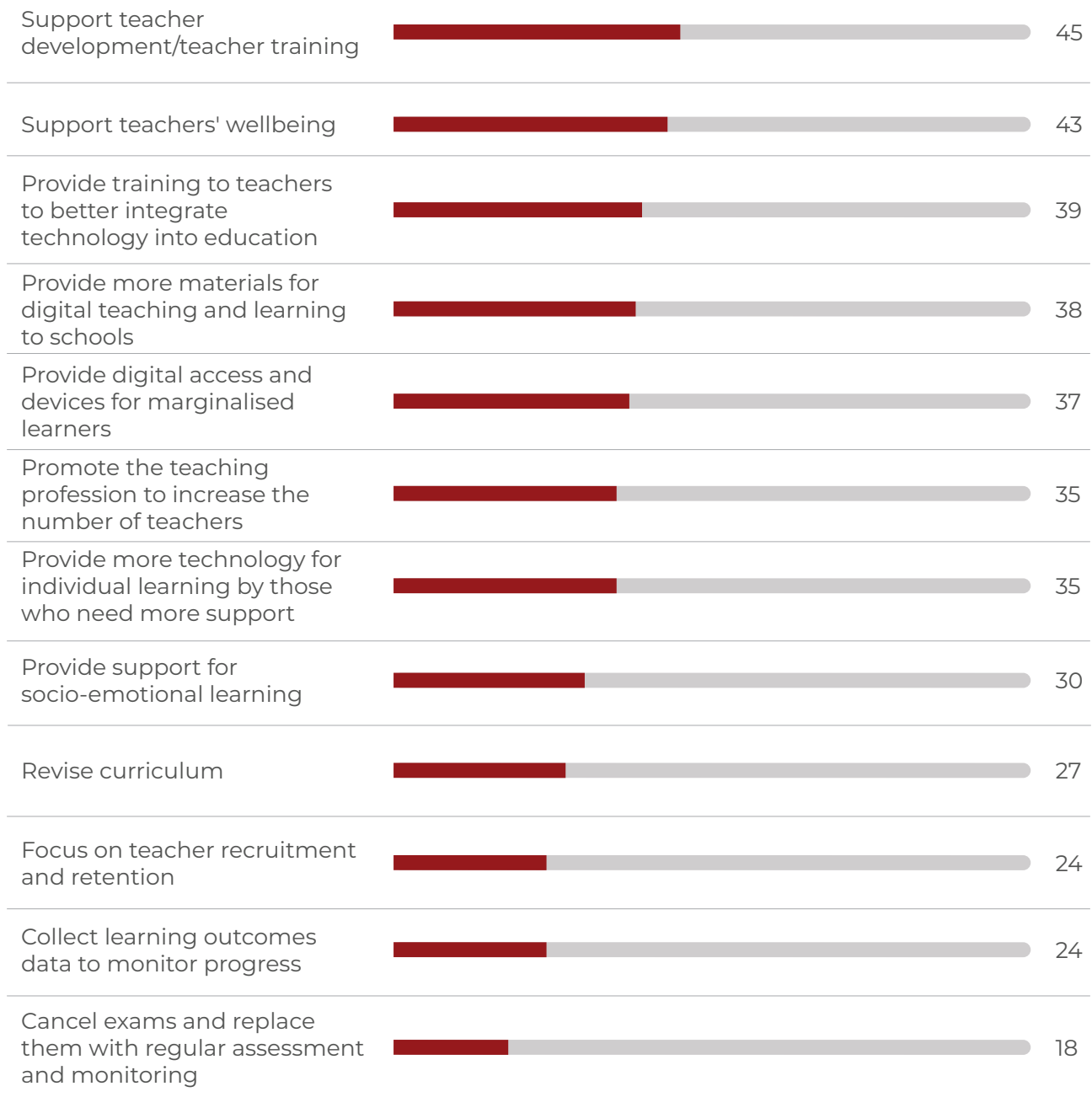
6.1.2 Supporting teachers' development or training was the top priority for government action, mentioned by 45% of teachers, while 43% said governments should support teachers' wellbeing. Even

so, one might have expected these to be ranked higher by many teachers. The most commonly cited technology-related priorities were to provide training to teachers to better integrate technology into education (39%), providing more materials for marginalised learners (38%) and make available internet access and digital devices for marginalised learners (37%). These ranked above more institutional or system-level actions such as teacher recruitment and revision of the curriculum, assessment practices and learning outcome data. It is interesting that teachers ranked technology-related items higher than areas such as curriculum revision or addressing teacher recruitment. There is a potential self-selection bias here, particularly in relation to the option to provide support and training for teachers to better integrate technology, as teachers with an interest in technology may have been more likely to participate in the survey.

6.1.3 One notably lower score was on support for more government action to collect learning outcomes data to monitor children's progress over the long term, which was selected by 24% of teachers. It is possible that many teachers believe that data on learning outcomes is already captured effectively. However, there is a

²⁵ <https://edtechhub.org/rapid-evidence-review-radio/>

What should governments do post COVID-19 to address any loss of learning experienced? Shown as a %



correlation with answers to other elements of the survey that showed relatively low proportions of teachers used technology to assess students' learning. This at first seems puzzling, given the scope for technology to be used for a variety of forms of assessment, including low-stakes multiple-choice questions. This is especially the case for curriculum subjects such as mathematics and science,

for which there are more clear right and wrong answers and less scope for subjective judgement in assessments. The potential value of computer-aided assessment may not be realised by teachers and schools, however. The findings may also reflect limits on schools' budgets to pay for such teaching and assessment models and the infrastructure to support them, which requires data handling

systems to capture assessment responses and report on them. Digital assessment systems are far more interactive than online instruction provision, which tends to be unidirectional, and as a result are more reliant on bespoke technology solutions and infrastructure. The findings may well also indicate teachers' reluctance for more data to be captured that may be used for assessing their own performance and hence threaten job security. Teachers' unions have often objected to such performance management measures.

6.1.4 It is encouraging that a relatively high proportion of teachers (37%) said governments should provide digital access and devices for marginalised students, such as children from low-income households, children with special educational needs, girls (in some countries and communities) and children who speak minority languages at home. This demonstrates understanding and demand among a substantial proportion of teachers to address marginalised learners' needs. It would be interesting to consider whether technology could be a means of increasing this figure further, for instance through greater dissemination of information on marginalised learners and their needs.

6.1.5 The proportion of respondents who wanted governments to focus on teacher recruitment and retention (24%) seems low considering the extent of shortages of qualified teachers globally. The lowest-ranked option was

cancelling exams and replacing them with regular assessment and monitoring, which 18% of teachers wanted. This is notable given prior literature on the value of formative assessment. Of course, in many countries exams and other summative tests were cancelled during the pandemic, requiring teachers in many instances to generate indicative grades and supporting evidence for students who would otherwise have sat high-stakes assessments including those giving access to selective secondary schools and to universities. It may be that many teachers are averse to replacing exams with regular assessments due to the potentially higher workload and training required. Equally, support for high-stakes exams as the fairest method of assessing what children can do in equal conditions may be greater among teachers than is often assumed. It should be noted, however, that some school systems have only high-stakes exams and are not really engaging in formative assessment as they lack the capacity or pedagogical approaches to support this. In a number of systems teachers are also far more involved in exam marking and are more involved in discussions around the grading of individual students, which typically is not the case in, for instance, the United Kingdom, United States and to some degree France with its baccalauréat.

6.1.6 Views of what governments should do to address learning loss among children during the pandemic were particularly strongly held among teachers in schools in towns or suburban

areas. For example, when asked if governments should do more to support teachers' development, the share of participants who agreed was teachers in towns (49%), in cities (45%) and in rural schools (44%). On support for teachers' wellbeing, the share of support was suburban teachers (47%), metropolitan teachers (44%) and urban teachers (41%). When asked if governments should train teachers to better integrate technology into education, 43% of town-based teachers agreed compared with 38% of teachers in both cities and rural schools. These findings are interesting as the survey typically found large differences between rural and urban schools on almost all other questions, with semi-dense/town teachers' responses sitting in the middle. Although the differences in percentage points were not large, the pattern was consistent across items in this section. It is clear, therefore, that teachers at semi-dense and town schools have a greater desire for government action, particularly to support their training and wellbeing, to improve technology and digital access for marginalised learners and to promote the teaching profession.

6.1.7 More experienced teachers showed greater demand for governments to take certain actions in comparison to more recently qualified teachers. These included revising the school curriculum, providing schools with more materials for teaching and learning, training and support for teachers to better integrate technology into education and collecting data on children's learning outcomes.

This correlation demonstrates that more teacher experience resulted in somewhat more demand on governments to address learning loss through these types of actions. This could be due to a greater understanding of the linkages between government policy and teaching and learning practices, and also due to more experienced teachers being better able to identify where issues exist and their impact.

6.1.8 Another trend was that teachers with less than two years' experience reported lower support for all options for potential action by governments to address learning loss experienced by children during the pandemic. This group consistently recorded outlier responses, even in comparison with teachers with between 3 and 5 years' experience. This indicates that there could be a significant change in relation to attitudes towards government action that occurs between these two early phases of teachers' careers.

6.1.9 There was wide variation in responses to teachers in different global regions, which broadly aligned with respondents' answers on learning loss. This pattern was evident across the Sub-Saharan Africa, North America, Latin America & Caribbean, and East Asia & Pacific regions. It would be interesting to explore further into what it is that prompts teachers from these regions to demand more action from governments; high responses from teachers in both Sub-Saharan Africa and North America suggest that it may not be purely due to resource provision.

When asked what schools themselves should do to help children catch up with lost learning, teachers' priorities reflected the more self-directed studying techniques required of many children during the pandemic.

Factors that could contribute to this include a reflection of the actual extent of challenges they face, a sense of collective responsibility to stimulate change, belief that governments can enact change and other awareness of policy or training on certain issues, such as the importance of socio-emotional learning.

6.1.10 A substantially larger proportion of teachers from North America chose as their priority for action to cancel exams and replace them with regular assessment and monitoring (42%, next ranked region = 20%). It would be interesting to understand why this is. For instance, to what extent are regular assessments occurring throughout the different regions, and what are teachers' perspectives on them? In responses to other survey questions, figures for teachers requesting training on assessment and monitoring of learners was relatively low (23%).

6.1.11 When asked what schools themselves should do to help children catch up with lost learning, teachers' priorities reflected the more self-directed studying techniques required of many children during the pandemic. Two thirds (67%) said schools should help students understand how they can learn better and develop independent learning strategies. This was more than twice the proportion who wanted a cut in

class sizes (31%). Half (51%) said they should give children more time to practice and reflect, rather than rely solely on direct instruction. Significantly, 46% said schools should engage with childrens' families more often, perhaps having seen the important role parents play in enforcing students' learning when many schools closed their premises. Nonetheless, less than half of teachers selected this as an action point for schools. It would be important to understand further the reasons behind why more teachers didn't select this option (e.g. they believe parent/caregiver interaction is sufficient/effective, they don't believe it is an important factor to improve, etc.).

6.1.12 In response to a further question on what could support teachers' practice in the coming year, the first and second most common answers related to digital technology. Support in developing skills and confidence in using digital technologies in teaching was top (54%) followed by help in teaching remotely (41%). Next ranked caring for teachers' mental health and wellbeing (39%) and support in developing pedagogy and teaching methods (38%). All of the above were much greater priorities than support in developing teachers' curriculum subject knowledge (32%).

Here, the findings are clear and heartening. Teachers were asked what the impact had been on the quality of their teaching: 86% said the experience made them a better teacher; just 4% said it made them worse and 10% thought it had no impact.

7. Teachers and the pandemic: a reflection

7.1.1 So how do teachers look back upon their own responses to the once-in-a-generation challenge of a global pandemic? More importantly, how did their experiences impact on their vocation as teachers? Here, the findings are clear and heartening. Teachers were asked what the impact had been on the quality of their teaching: 86% said the experience made them a better teacher; just 4% said it made them worse and 10% thought it had no impact. This is remarkable given the multiple challenges of transferring at short notice to what for most were entirely new modes of instruction and given the difficulties faced by children in many schools of achieving high-quality online connectivity and access to digital devices. It is, however, consistent with teachers' reports of their high rates of engagement with professional development during this period. It would be interesting to delve further into this and understand what aspects of teaching respondents feel have improved and why; e.g., do teachers feel that their use of technology improved? Their lesson planning and assessment? The quality of their engagement with parents? Furthermore, it would be

interesting to understand what the response to this question would be in normal times. This would test whether teachers always feel they have improved after another year in the job.

7.1.2 This came at a cost to teachers themselves. Asked to describe what happened to their own physical, mental and emotional wellbeing since the pandemic started, 39% said that their wellbeing had suffered. A further 36% reported that their wellbeing was about the same and only 25% said it had improved. The fact that almost four in 10 teachers said their wellbeing has suffered over the past year is worrying and calls for more support for teachers in this area, as they themselves have called for. It would be very interesting to understand the contributing factors behind why teachers' wellbeing improved, particularly around how technology played a role. It is equally important to understand the factors behind why teachers' wellbeing suffered, to what extent, and how they can be better supported. Approaching this with the view that the pandemic generally has been detrimental to people's wellbeing and physical/mental health, the results could be viewed positively, in that 61% of teachers reported either an improvement or no negative impact. This could imply that schools, districts, governments or

...the teaching profession across the world stepped up to the challenge, led by the most experienced teachers. They turned to technology and engaged with new digital tools and pedagogies. They enhanced their skills with high amounts of professional development. They reached out to their students and parents in new and imaginative ways. Most teachers felt they developed as professionals over the year. And many are even more committed to teaching as a result.

their colleagues were quite effective in their support to teachers.

7.1.3 Another key question was one that asked participants about their attitudes to teaching since the pandemic started. This found that half (50%) were more enthusiastic about their vocation and fewer than a quarter (22%) less enthusiastic. Slightly more than a quarter said they felt about the same. That half of the respondents felt more enthusiastic about teaching is another positive response from teachers as school systems move on from the pandemic. The response was broadly similar among teachers with different levels of classroom experience, with only slightly higher rates of enthusiasm among those who had been teaching for between 6 and 20 years (52%). It is important to note that enthusiasm was also high among the least experienced teachers: among those who had taught for between 3 and 5 years the figure was 49% and for those with less than 2 years it was 48%. Again this is encouraging, given that newer teachers with less skill and confidence in the craft of teaching clearly encouraged more challenges in the pivot to digital learning.

7.1.4 Understanding the reasons behind the increased enthusiasm would be a fruitful exercise, and could help to address broader issues of motivation among teachers. Similarly, understanding the factors behind why almost a quarter responded that they were less enthusiastic, and working to address these, is important. We should note that there may be a potential bias here in that a volunteer sample could imply participant teachers are more engaged in their profession in the first place, and therefore introduce possible sampling bias. Even so, it chimes with the overarching theme of the survey: that during the pandemic as schools shut down and switched to remote learning, the teaching profession across the world stepped up to the challenge, led by the most experienced teachers. They turned to technology and engaged with new digital tools and pedagogies. They enhanced their skills with high amounts of professional development. They reached out to their students and parents in new and imaginative ways. Most teachers felt they developed as professionals over the year. And many are even more committed to teaching as a result.



India



Nigeria



Philippines



United Arab
Emirates

Country Reports





India

India was notable for the severity of Covid-19 pandemic in the country, with the second highest number of confirmed cases in the world after the United States. India experienced a second wave of infections in March 2021 with shortages of vaccines, hospital beds, oxygen and medicines in many parts of the country. This was shortly before the survey took place. However, almost two thirds of Indian teachers (64%) reported that all students had continued to progress in their learning in the previous year, significantly higher than the global average (50%).

More than one in five (22%) teachers in India said that girls had experienced more learning loss than boys during the previous year, which was 14 percentage points higher than the global average reported by all teachers (12%). An even higher proportion (25%) said that parents had prioritised boys' learning over that of girls during the pandemic, much higher than the average elsewhere (14%).

These figures are concerning and should prompt debate and reflection in India about why girls' education was perceived to be given lower priority than that of boys by almost one third of families. Learning loss among other groups of children observed by their teachers were generally lower than or in line with global averages, such

Nor did children from the financially poorest households experience disproportionate learning loss (45%).

as among students whose parents were unable to support them in their lessons outside school (32%), children with low prior levels of attainment (18%) from an unstable home background (22%). Nor did children from the financially poorest households experience disproportionate learning loss (45%). India stands out, therefore, on the issue of girls' education, which is a fundamental issue of equity and, indeed, of human rights.

Asked what their school should do to help children catch up with lost learning post Covid-19, almost one in five (19%) said more hours should be added to the school day or other ways found to increase teaching time. This is higher than the average responses from teachers worldwide who supported this option (15%) and reflects well on the commitment of teachers in India, given that this would lengthen their own school day, too.

The large number of teachers in India who participated in the survey (n=3,067) adds particular value and interest to these findings.



Nigeria

Three in five (60%) of teachers in Nigeria reported that their school does not have internet access. This is deeply concerning, given that the average for all respondents to the survey was slightly above one in five (22%). A much greater share of Nigerian teachers said they had internet access at their own home (62%), but this balance is not the basis for a stable or successful school system. When asked what factors limited their school's capacity to provide a high-quality education during the pandemic, 50% said insufficient internet access impacted a lot, 13% quite a bit and 22% to some extent.

In a similar vein, more than a quarter (26%) said their school does not have any digital devices and almost as many (23%) said just one computer, laptop or tablet was available for their entire school. Another troubling statistic was that 8% of Nigerian teachers said that their school has digital devices available but none of them are working. This illustrates that governments and regional education authorities, and indeed non-profit organisations, that offer to supply or monitor the availability of technology hardware in schools must take account of the quality of schools' existing stock of devices and plan for their regular replacement.

...half as many used digital resources most days to assign learning tasks to children...

One third of Nigerian teachers (33%) said that they or their families paid for their training or professional development during the pandemic, which was significantly higher than for most teachers globally (21%) Nigerian teachers were much less likely than teachers globally to use digital resources in the year spanning the peak of the pandemic: half as many used digital resources most days to assign learning tasks to children (24% v. 42%), fewer explored new teaching methods online (37% v. 44%) and far fewer used technology to design teaching and learning tasks.

When asked what factors hindered their school's capacity to provide high-quality education, a shortage of qualified teachers was a commonly-held concern: 19% of teachers in Nigeria said this held their school back a lot, 18% quite a bit and 43% to some extent. A total of 549 Nigerian teachers took part in the survey.



Philippines

The Philippines is unusual in that more respondents to the survey said their school has internet access (76%) than the proportion of teachers who can access the internet at home (65%). For most teachers elsewhere, this pattern was reversed. Even so, a very high share of teachers said that insufficient internet access hindered their school's capacity to provide high quality learning a lot (45%) or quite a bit (29%). This suggests that, even when schools have connectivity, it is often of poor quality.

More than two thirds of teachers (67%) said they had to bring their own device with them to school, much higher than the global average (42%). There was a higher degree of concern among teachers in the country than the global average about shortages or inadequacies of technology for instruction available to them (38% v. 29%).

Teachers in the Philippines were much more likely to use technology for basic educational applications: 22% taught classes online (almost half the global average), while 87% made printed copies of digital resources to share with children. In general Filipino teachers reported lower scores than the global average for engaging most days with digital resources, for example to create lesson plans (37% v. 47%),

This suggests that, even when schools have connectivity, it is often of poor quality.

find instructional materials (44% v. 53%), to explore new teaching methods (37% v. 44%) and, in particular, to assign learning tasks (29% v. 42%).

They were significantly more likely to contact their students through messaging services: 70% said they did so during the pandemic, 7 percentage points above the average for teachers worldwide. However, it is important to note that teachers in the Philippines reported lower levels of concern over learning loss among their students than respondents generally, suggesting that their response to the pandemic appeared to be effective.

The number of responses to the survey from teachers in the Philippines (n=7,289) was the greatest of any country, giving a high level of confidence to these findings. These also offer educational researchers further opportunity to use the data for additional and more specific country-level exploration into the items covered.



United Arab Emirates

Access to the internet is near-universal in schools in the United Arab Emirates: 99% of teachers reported that their school has connectivity. A caveat, however, is that almost one third of teachers (32%) and an even higher proportion of school children (37%) had to bring their own device to school. This latter figure is twice the global average (16%) and raises fundamental questions about equality.

Nonetheless, teachers in UAE were able to use the more sophisticated platforms and tools to teach during school lockdowns. A very high proportion (83%) taught classes online during the pandemic, which was among the more interactive and potentially engaging forms of remote teaching, and almost two thirds (64%) taught hybrid lessons online and face-to-face at the same time.

Almost three quarters (74%) used a school learning platform to share lessons and allocate learning tasks, while almost half (49%) recorded instructional videos and four in ten (43%) made audio recordings to share with children in their classes. UAE teachers were far more likely to say they used technology for teaching and learning daily or most days: 83% used digital resources to create lesson plans every day or most days, 84% to find instructional materials, 79% to assign learning

However, almost two in five (38%) said teachers should be allowed greater freedom in lessons, compared with a global average of 30%.

tasks, 76% to provide feedback to students, 69% used online tools or computer-based testing to assess students' learning.

Almost half (47%) said they shared lessons and tasks with children via email and just 15% of UAE teachers said they printed out copies of digital resources to share with their students, compared with around half of teachers worldwide.

It is noticeable, too, that the United Arab Emirates had a high share of teachers who took part in professional development or training (91%) in the year spanning the peak of the pandemic. Fewer said they or their families paid the cost (16%) and more said the cost of their professional development was met by their school (28%). However, almost two in five (38%) said teachers should be allowed greater freedom in lessons, compared with a global average of 30%.

Asked whether all students continued to progress their learning during the pandemic, more than three quarters (77%) of UAE teachers agreed. There were 1,035 participants from UAE.

A woman with curly hair, wearing a grey face mask and a blue button-down shirt, stands in a classroom. She is holding a small object in her right hand. The background is filled with educational posters: a large 'MATH' sign, a poster with 'E=mc^2', '2+4', 'A+', 'Learn', and '1+1=?', a 'Success' poster, a world map, and a poster with 'MATH' and a clock. A large whiteboard is visible behind her, and a black trash can is in the foreground.

Conclusion

9.1.1 The findings of this large survey of teachers from across the world present practitioners and policy-makers in education with a paradox. While most children continued to learn during the pandemic, their experiences varied to an unacceptable degree. The pattern and degree of learning loss experienced among millions of children from when schools closed or their education was disrupted is real and urgent. And yet, the upskilling of the teaching profession worldwide offers an immense opportunity, as does the rekindling of commitment and enthusiasm for their craft that so many teachers described. Teachers, particularly those with the longest experience in the classroom, learned new digital skills, adapted their pedagogies and invested hugely in their professional development by engaging in significantly above-trend amounts of training during the year 2020-21, spanning the pandemic. Almost a quarter paid from their own salaries or drew on their families' resources to do so.

9.1.2 The answer to this paradox is equally apparent. Nothing can replace the synergy, the spark, the special relationships forged by face-to-face teaching in the classroom. And yet, technology

holds the potential to be a great leveller in education when systemic considerations around equity, access and inclusion are forefronted. Technology can supplement and enhance in-person teaching with interactive lessons, personalised learning and assessment for children with specific needs, from the most disadvantaged to the most able. It offers fast and efficient sharing of classroom craft among teachers worldwide. And it can connect teachers and children in remote or marginalised locations and communities. Children who are absent from school need not miss their lessons. It is just as likely, perhaps much more so, that the digital divide that has been exacerbated during the experience of remote learning during the Covid-19 global emergency, and is chronicled by this survey, could widen educational inequality still further. More than one third (37%) of teachers want governments to provide digital access and devices to children from low socio-economic status groups, children with special educational needs and other groups with higher needs; their call should be heeded. Rapid action is needed, by the international community, governments, education authorities and schools, to narrow and if

Teachers, particularly those with the longest experience in the classroom, learned new digital skills, adapted their pedagogies and invested hugely in their professional development by engaging in significantly above-trend amounts of training during the year 2020-21, spanning the pandemic. Almost a quarter paid from their own salaries or drew on their families' resources to do so.

While the circumstances of the pandemic were an extreme event, technology in schools is no longer a ‘nice to have’ element but is integral to a high-standard, rounded education. This means substantial new investment in technology at all levels: in connectivity, in devices and in software.

possible close this digital divide and harness the goodwill and new-found skills of teachers.

9.1.3 The importance to children’s learning of equitable access to the internet and to digital devices must be taken far more seriously by the international community. Connectivity is not a silver bullet. Nor is technology hardware. Ensuring that educational content is accessible online or offline is crucial. Blended modes of learning are key, given the huge amount of investment in infrastructure required to enhance internet connectivity, particularly in LMICs and rural and remote areas within these. This means developing educational resources that can be accessed through multiple modalities, channels and means (online or offline, through low-tech and high-tech options). That said, equitable access to the internet is a key building block in narrowing educational inequalities. The United Nations Sustainable Development Goals make only passing reference to this: SDG 4.1 (to ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes by 2030) defines basic school infrastructure as access to drinking water, handwashing facilities and electricity. Its most

recent progress report to the Secretary General (July 2021) made a single reference to ‘availability of internet and computers for pedagogical purposes in schools’ being low. This issue must be given higher priority.

9.1.4 It is very clear that teachers and their students need better access to technology. That means both internet access of high enough quality to facilitate the streaming of live online lessons when required and more digital devices: laptops, tablets, even smartphones. It is simply unsustainable for 42% of teachers across the world to bring their own devices to school to support their students’ learning because so few children would otherwise not be able to watch educational videos, access learning resources or develop technology skills that will be ever-more important in the economy of the future. While the circumstances of the pandemic were an extreme event, technology in schools is no longer a ‘nice to have’ element but is integral to a high-standard, rounded education. This means substantial new investment in technology at all levels: in connectivity, in devices and in software. It is time to investigate bold ideas such as free internet access for schools and a credible plan to connect tens of thousands

more schools to the internet every year. Technology companies and telephone and mobile network providers should step up here, alongside international bodies and governments.

9.1.5 Reversing the digital divide also means changes to the way in which schools and teachers operate. There are, for instance, questions to ask about why computer-based assessments were not routinely used more widely by teachers during the pandemic. Regular assessment is integral to effective learning and digital resources can facilitate this well. Training, supervision and support for newly qualified and less experienced teachers should be examined to find out why teachers with less classroom experience were significantly less likely to teach lessons online especially using video conferencing tools, school virtual learning environments, or to engage in technology-related training. Teachers of mathematics, and the mathematics community at large, should be asking why their subject appears to be out of step with other curriculum areas in engaging with online learning, digital education tools and training in technology.

9.1.6 Schools and education authorities should urgently be reviewing and enhancing safeguarding rules and online safety training for ways in which teachers use technology to communicate with children using direct messaging channels such as SMS and WhatsApp, given the clear risks of their misuse or of false allegations. The wide use

of such communication tools may have been a byproduct of a lack of basic IT infrastructure that allows for teacher to student/parent communication in a more controlled environment (i.e. email within a productivity suite such as Office 365/GSuite or a messaging via a dedicated learning platform). The specific nature of the pandemic probably resulted in teachers seeking to communicate with students by whatever means was available, but school leaders and education authorities should be reviewing all factors to ensure a more suitable communications infrastructure is in place moving forward.

9.1.7 Schools and education systems should also invest in their teachers. From survey responses, we know that there is variety in the usage of and training for technology across teachers with different levels of experience. Schools need to work with teachers to understand how they can effectively support and better design training to help them engage with digital resources for teaching and learning. Most of all, however, school systems should value teaching experience. The survey evidence of how teachers who were more advanced in their careers dealt best with the pivot to online learning reinforces the fact that there really is no substitute for a workforce of experienced, confident, committed teachers. This is a core asset to any school system and approaches to professional development, career advancement, pay and retention should reflect this.

If the pandemic has taught us one thing about education, it is the immense opportunity offered by technology to guarantee and enhance the uninterrupted learning of school children across the world, even during a prolonged period of global crisis.

9.1.8 Among the most troublesome data to emerge from the survey relates to the poor availability and use of technology in low-cost private schools. The evidence base for impact of these schools is inconclusive. Some previous studies have suggested that low-cost private schools perform at least as well as government-funded schools in some LMICs while operating on significantly smaller budgets. Several such reports, however, relied on self-reporting. Other analyses have suggested the opposite, although again the data is inconclusive. More research is therefore needed to understand the dynamics of low-cost private schools and how they can be supported to enhance teaching and learning for all.

9.1.9 If we accept that technology has an integral role to play in enhancing children's education and, when used well, in broadening their opportunities, we must consider how schools, and education systems more broadly, will meet certain unavoidable baseline costs associated with its infrastructure. In this survey low-cost private schools repeatedly ranked lowest on most items in relation to access, deployment, training and safeguarding children and teachers. This is a worrying picture and raises the question of what added value, if any, such schools offer in comparison to

government schools. A high number must improve the modes of instruction they offer and have often neglected the contexts in which they work. The survey shows that a high proportion of charity/ NGO schools are addressing the challenges they face much more effectively. There is a case for an independent evaluation of the quality of education offered by low-cost private schools in low and middle-income countries, with a focus on how they use technology for learning. This should be conducted by a credible, non-partisan organisation. Such an exercise should consider whether the trade-off between these schools' model of driving down costs to achieve ultra-low fees is, or is not, producing an acceptable standard of education.

9.1.10 If the pandemic has taught us one thing about education, it is the immense opportunity offered by technology to guarantee and enhance the uninterrupted learning of school children across the world, even during a prolonged period of global crisis. This opportunity to supplement and enrich education will only grow as more sophisticated digital tools for learning are developed and teachers become more confident and skilled at using them. This opportunity must be seized. The pandemic has also taught us that access to and use of technology for education

has the potential to widen social divides and further marginalise disadvantaged groups of children. It is fundamental that any decision-making process around technology in education is rooted in enhancing equitable outcomes. The potential that technology offers must be spread as widely and equitably as possible among children and young people, whoever they are and wherever they are.

Summary of recommendations

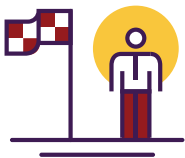


1. Digital access

The international community should give higher priority to seeking more equitable access to the internet to support children's education. Education actors, including governments, must work with technology and telecommunications providers to consider bold ideas such as free connectivity for schools. We recognise, however, that in countries where electricity supply is a challenge, its provision should take priority.

We need the systematic and regular collection of data on schools' access to the internet in each country, with a simple grading system for the quality of their bandwidth or mobile network coverage, using a globally accepted method. This should be overseen by an international body.

It is shocking that 42% of teachers bring their own digital device to school for work purposes. Providing access to technology devices and resources for teachers and children in disadvantaged groups must be a priority, accompanied by a better understanding of how technology can be most effectively deployed to reduce the digital divide.



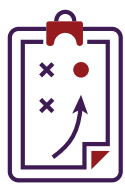
2. Valuing teachers' experience

The leadership role played by experienced classroom teachers illustrates their critical importance to school systems. Governments and education authorities should re-evaluate strategies to retain and support experienced teachers, including enhanced salary scales and other forms of increasing motivation.



3. Technology and assessment

The use of technology for regular formative assessment by teachers as well as for periodic formative testing is under-utilised and its development should be a priority for the education community and technology companies, including bespoke models for school systems with large class sizes and that use whole-class teaching.



4. Mathematics teaching and technology

A representative body for teachers of mathematics should investigate engagement with digital teaching tools among maths teachers including their access to and take-up of subject-specific teacher professional development and identify potential barriers to technology use for the benefit of children's education worldwide.



5. Teachers' professional development

More focus on using digital resources should be given in teachers' professional development with an emphasis on how these can support the context in which teachers are working, including in using digital learning platforms where appropriate.

Schools, regional authorities or governments should investigate ways to use technology to bring teachers together for more interactive and reflective professional development including semi-structured interactions in communities of practice.



6. Safeguarding

Schools should have robust safeguarding arrangements whenever digital communications are used by teachers to contact students, especially direct messaging services.

Regular training and support in staying safe online must be offered. Authorities must support schools and ensure these are in place, to protect children and teachers.



7. Low-cost private schools

A credible, non-partisan organisation should conduct an independent evaluation of how technology is used for learning in low-cost private schools in low and middle-income countries. This should compare outcomes for children with those of government-funded schools in similar settings and contexts.

Appendix

Survey questions

About you.

During the last 12 months, did you work as a school teacher?

What best describes your gender? Select one answer.

Select where you teach.

Do you have any long-standing illness, disability or infirmity? (Long-standing means anything that has troubled you over a period of time or that is likely to affect you over a period of time)?

How many years of school teaching experience do you have?

What is the highest qualification for teaching you have received?

About your school.

What type of area is your school located in? Select one answer.

What type of school do you teach at?

Select your school's main curriculum

Describe the infrastructure usually available in your school

Which of the following best describes the digital devices usually available in your school? Select all answers that apply to you

About your learners.

What age are the learners you are teaching this year? Select all answers that apply to you.

If you are teaching at a secondary school or tertiary college/university, what subject(s) do you teach? Select all answers that apply to you.

Overall, how would you describe the socio-economic status of the learners at your school? Select all answers that apply to your school.

Teaching during the COVID-19 pandemic.

What happened to your school during the COVID-19 pandemic?

You said that your school was closed during lockdowns. Were teachers able to undertake remote learning in those times? Select one answer.

Did you do any of the following in the COVID-19 pandemic?

During the last 12 months, how often did you do the following activities?

Did your school encourage you to use any digital resources for lesson planning and teaching? Yes No

Which digital resources did your school encourage you to use?

Overall, how useful was the Virtual Learning Environment/LMS to your teaching?

- Overall, how useful was the School or community interactive platform to your teaching?
- Overall, how useful was the video conferencing tool to your teaching?
- Overall, how useful were the digital textbooks to your teaching?
- Overall, how useful were the quiz tools to your teaching?
- Overall, how useful were the video resources to your teaching?
- Overall, how useful were the audio resources to your teaching?
- Overall, how useful were the web resources to your teaching?
- Overall, how useful was messaging and social media to your teaching?
- Overall, how useful was broadcast radio to your teaching?
- Overall, how useful was broadcast TV to your teaching?
- Overall, how useful were the other digital resources used to your teaching?

Current teaching challenges.

To what extent is this school's capacity to provide quality instruction currently hindered by any of the following issues? Select one answer per row.

Learning loss and teaching post COVID-19.

What are your experiences with learners in your class(es)?

- a. You told us that some or none of your students have progressed their learning (or you didn't know). Have any of these things been affected?
- b. Have you noticed anything else has been affected as a result of your students not being able to progress their learning during this time?

If your school reopened following closures for the COVID-19 pandemic, which of the following has taken place? Select all answers that apply to you.

Have any of these groups of learners experienced more learning loss than other students?

In your experience over the past 12 months, are any of these true?

Have you noticed any other groups of learners who have had a poorer quality or reduced learning experience compared to others?

What should your school do post COVID-19 in teaching, pedagogies or structurally to help learners to catch up? Select all answers that apply.

What should governments do post-COVID-19 to address any loss of learning experienced?

Your professional learning.

During the past 12 months did you take part in any form of teacher professional development or training (organised or self-initiated)?

- a. You told us that you took part in teacher development or training in the past 12 months. Who paid for the cost of it?
- b. You told us that you took part in teacher development or training in the past 12 months. What did it focus on?
- c. You told us that the focus of your professional development or training was the use of technology tools and resources for online teaching. What kind of tools or resources did you learn about?

Think back across the (organised or self-initiated) professional development or training you experienced over the last 12 months (on any topic). Overall to what extent did your practice change as a result?

How much time in total was spent on your professional development or training over the last 12 months? Add up the actual time you spent and answer in whole days.

An extensive global platform might be developed over the coming year where teachers can share classroom practices with others outside their regions. Would you consider using this to share teaching resources and lesson plans that you have created yourself?”

Which is NOT the type of school you teach at?

Your needs as a teacher.

Which of the following areas could support your teaching in the next 12 months? Select up to five (5) answers maximum.

What further support could help you in the next 12 months?

Do you need more access to software or other (non-hardware) digital resources for the following tasks? Select one answer per row.

The COVID-19 pandemic and the teaching profession.

Which of these statements best describes the quality of your teaching during the COVID-19 pandemic? Select one answer.

How do you feel about teaching since the pandemic started?

a. You told us you were more enthusiastic about teaching now. Why?

b. You told us you were less enthusiastic about teaching now. Why?

How would you describe the level of respect/esteem that parents/ caregivers have for teachers since the pandemic started? Select one answer.

How would you describe what has happened to your physical, mental and emotional wellbeing since the pandemic started? Select one answer.

Which of these statements best describes your current plans in the teaching profession?

How likely are you to recommend teaching to friends, family or others?



About T4 Education

T4 is a global organization committed to providing engaging tools, initiatives and events for teachers to improve education. We believe in community strength and the network effects that come from bringing teachers and schools together. We want to shine a spotlight on the great work we see happening in classrooms worldwide.



About EdTech Hub

EdTech Hub is a global non-profit research partnership. Its goal is to empower people by giving them the evidence they need to make decisions about technology in education

About the authors



Vikas Pota

Vikas is the Founder of T4 Education. Prior to T4, in the education sector, Vikas set up and ran a philanthropic foundation focused on teachers where he launched and ran the Global Teacher Prize as a way of shining a spotlight on the greatness of the profession; he has

made the case at UN platforms, the G20 and to several Governments about the Sustainable Development Goals; he established a technical & vocational skills business in Africa to tackle the youth unemployment crisis; he set up a corporate venture capital business investing in high growth edtech businesses; and lead on the brand, marketing, communications, and corporate affairs strategy for a globally renowned K-12 education business.

Vikas serves on several non-profit boards including The Education Outcomes Fund, Artists in Residence, Global School Leaders, Queen Rania Teacher Academy, Educate Girls, and Teach for All. He is a Honorary Lecturer at UCL Institute of Education, was a Visiting Practitioner at Harvard Graduate School of Education, and served as a Senior Policy Fellow at the University of Cambridge's Centre for Science & Policy. He has been recognised as a Young Global Leader by the World Economic Forum; was accorded the status of one of London's 1000 most influential persons; is a member of the Young Presidents Organisation; has been awarded two honorary doctorates by leading universities in the world in recognition of his achievement. Often quoted in the media, Vikas is a passionate advocate of the transformative power of a good education and is actively building a global community of teachers and schools to make that a reality.



Sara Hennessy

Sara is a Research Director at EdTech Hub, and a Reader in Teacher Development and Pedagogical Innovation at University of Cambridge. Her particular responsibilities include leadership of the 'Teachers' theme and convening the Hub's Advisory Pool.

Sara has worked in the field of EdTech for over three decades now, focusing particularly on professional development, teacher inquiry, and interactive pedagogy, including in sub-Saharan Africa (e.g. www.oer4schools.org). She also co-leads the interdisciplinary Cambridge Educational Dialogue Research (CEDiR) group and is an Editor of the British Journal of Educational Technology.



Asma Zubairi

Asma is a Research Fellow at EdTech Hub and works mainly in the “Systems” theme. Asma is especially interested in what role EdTech can play in improving educational access and learning for those children most at risk of falling behind.

Her work in the Hub is very much concerned with generating evidence about the extent to which technology can help the most disadvantaged children. Prior to her current role at EdTech Hub, Asma completed a PhD at the University of Cambridge on the impact of Malawi’s political settlement on teacher management at the district level. Alongside her PhD Asma also led and co-authored pieces of research focusing on equitable education systems for organisations such as the Mastercard Foundation, Malala Fund, and the Education Commission.



Saalim Koomar

Saalim is involved in both research and engagement work at EdTech Hub. This means that he supports the building and uptake of evidence to support effective decision-making. Saalim has recently been involved in projects concerning teacher professional development, country scoping studies, and various Helpdesk requests.

Saalim has taught in UK schools for 5 years, initially teaching French and Spanish at the secondary level but also working in primary and early years settings. Alongside this, Saalim has completed a Masters in Development Studies at SOAS, University of London.



Adam Kreimeia

Adam is a Research Assistant at EdTech Hub and will become an EdTech ODI Fellow with the Sierra Leonean Ministry of Education later this year. Adam has worked on a number of research projects at the Hub, including a systematic review on teacher professional development, an equity position paper, and country scoping reviews on Bangladesh and Sierra Leone. He additionally works on monitoring and evaluating the Hub’s outputs and the impact it has.

Adam taught for over four years in Libya, Spain, and with refugee communities, including at the ‘Jungle’ camp in France. He completed a MA at the Centre for International Development (UCL), focusing on educational planning and the economics of education. Adam specialised in education and conflict, basing his dissertation on the privatisation of education in conflict-affected contexts.



Carla Aerts

Carla is an inter-disciplinarian and an international Learning with Technologies, informed by the Learning Sciences Thought Leader. She has worked across the globe with EdTech startups, publishers, educators and academia as well as policy makers. Carla is the current

Director of Digital Change at Hodder Education, founded Refracted! an online community about learning with technologies and the futures of education in a digital and AI-driven world.

She is a member of the WEF AI expert group, a board member at Right for Education Africa and an advisory board member of DEFI (Digital Futures Education Initiative) at Cambridge University. Carla ran the Tmrw Institute, a catalyst and Think Tank on education in a digital age, ran the Next Billion EdTech Prize and was Director of Futures at UCL Institute of Education as well as Global Digital Director Education at Cambridge University Press.



Claire Gault

Claire is an experienced global brand and insight leader based in Australia. She was awarded a Bachelor of Arts/ Bachelor of Laws from the University of Queensland, with awards for academic excellence. Claire has worked for the past 20 years in roles where market research

and insight has been central to success. She has worked in the education sector across Asia, Africa, Middle East, North America and European markets leading the development of education services and teacher advocacy initiatives.

Acknowledgements

T4 would like to thank all the teachers that took time to support us with this project. In addition, we'd like to thank a number of report contributors and partners.

We are grateful to EdTech Hub for contributing extensive staff time throughout the process of designing, administering, analysing and reporting on the survey, and to Vicky Collis, Managing Director at the time.

Special thanks to our ambassadors and alliance partners that supported translation services and provided operational support:

Abdullahi Ibrahim, Abhilasha Singh, Alejandra Clerici Arias, Alfonso Navarro Carvall, Anita Singh, Areej Alghamdi, Asnaha Farheen, Bushra Afreen, Ezequiel Chavez Colli, Ibrahim Kalie Sumah, Irma Hoxha, Jasmane Frans, Minu Melwani, Mohammed Mustapha Yakub, Olayemi Adewale, Shamal Sabah Alsarai, Silvia Scuracchio, Sithembiso Mbatha, Sophia Kouzouli, Sophia Kouzouli, Francis Ameh, Haliq Shah, Jemai Douha, Liana Karapetyan, Jasmane Frans, Minu Melwani, Mohammed Mustapha Yakubu, Olayemi Adewale, Shamal Sabah Alsarai, Silvia Scuracchio, Sithembiso Mbatha, Sophia Kouzouli, Francis Ameh, Haliq Shah, Jemai Douha, Liana Karapetyan, Maia Tkemaladze, Malarvizhi MuthuRahavan, Rabeya Binte Habib, Shamosh Zola (Md. Shamsuddawha), Shanti Subramaniam, Shinichi Yamanaka, Waleed Ragab Awad, Fasahat Iqbal, Anum Mohsi, Sandra Grujevska, Mari Hirata, Željana Radojčić Lukić, Xueqin Jiang, Rita Pereira, Lemann Foundation.

Special thanks to the following individuals for helping us design the survey:

- Vandana Goyal, Avanti Fellows, India
- Rebecca Winthrop & Emiliana Vegas, Brookings Institution, USA
- Lucia Dellagnalo, CiEB, Brazil
- Bikkrama Daulet Singh & Gouri Gupta, Central Square Foundation, India
- Yuhyun Park, DQ Institute, Singapore
- Vishal Talreja, Dream A Dream, India
- Azad Oommen & Sameer Sampat, Global School Leaders, USA
- Fernando Reimers, Harvard University, USA
- Amy Klement & Erin Simmons, Imaginable Futures, USA
- John Goodwin, LEGO Foundation, Denmark
- Denis Mizne & Camila Pereira, Lemann Foundation, Brazil
- Andreas Schleicher, Francesco Avvisati, Gabor Fulop & Pablo Fraser, OECD
- Amit Patel, Owl Ventures, USA
- Rukmini Banerji, Pratham Education Foundation, India
- Refaat Sabbah, Teacher Creativity Centre, Palestine
- Vongai Nyahunzvi, Teach for All, UK
- Folawe Omikunle, Teach for Nigeria, Nigeria
- Asyia Kazmi & Izzy Boggild-Jones, The Bill & Melinda Gates Foundation, USA
- Osama Obeidat, The Queen Rania Teacher Academy, Jordan
- Rob Jenkins, UNICEF, USA
- Jaime Saavedra & Harry Patrinos, World Bank, USA

Many thanks to our 2021 Country Ambassadors for their continued excellent support:

Irma Hoxha, Alejandra Clerici Arias, Liana Karapetyan, Peita Bates, Mohammed Abo Hassan, Rabeya Binte Habib, Md. Shamsuddawha, Asnaha Farheen, Silvia Scuracchio, Alfonso Navarro Carvallo, Danijela Šajtar, Chantal Goedertier, Waleed Ragab Awad, Maarit Rossi, Maia Tkemaladze, Mark Klutse, Mohammed Mustapha Yakubu, Sophia Kouzouli, Ajaz Lone, Ranjana Harlalka, Nelofhar Shaikh, Mohammed Abdul Salam, Yogesh Kumar, Minu Melwani, Sumedha Sodhi, Shamal Sabah Alsarai, Shinichi Yamanaka, Edwine Matengo, Jackline Oduor, Elie S. Saab, Doreen Myrie, Halique Al Nasir, Jasmane Frans, Roger Chu Lin Toh, Shanti Subramaniam, Ezequiel Chavez Colli, Tatiana Popa, Aziz El Bakkali, Surya Karki, Chantal Goedertier, Dauda Adeyoola, Yerima Shadrach Ali, Olalekan Sowunmi, Sola Oloruntimehin, Ngunan Gertrude Kwado, Olayemi Jeremiah Adewale, Chigozie Asogwa, Francis Ameh, Abdullahi Ibrahim, Vasilka Gjurchinovski, Jasminka Gudomanova, Yasmeen Samir Dalloul, Hilda Awwad, Alfonso Navarro Carvallo, Jade Bata, Wendell Cabrera, Joanna Marie De Borja, Cornelia Bataus, Areej Alghamdi, Branka Ranisavljevic, Ibrahim Sumah, Jasmane Frans, Sithembiso Mbatha, Sihle Ngesi-Magubane, Nuwan Dissanayaka, Samia Briki, Chefia Cheikhrouhou, Douha Jemai, Angela Matheson, Simon Peter Okiria, Herman Makanga, Charles Kigundi Odong, Natalia Kidalova, Malarvizhi MuthuRahavan, Bushra Afreen, Anita Singh, Abhilasha Singh, Doreen Myrie

In addition, many thanks to our Alliance Members for their partnership:

Acessivel Exito Associacao, African Children and Youth Development Network (ACYDN), AiR (Artists in Residence, Aspen Institute Mexico, Association of Science Technology and Innovation, Avanti Fellows, Centre for Wildlife Studies, David Rattray Foundation, DQ Institute, Dream a Dream, EducAid Sierra Leone, Educate!, EdukoMondo, EduSpots, Elige Educar, enjuba Spelling Bee, Enseña por Argentina, Fondation Zakoura Education, Funtasia Enterprise, Future First Kenya, Girls' Dignity, Global School Leaders, Global Schools Forum, Green Bronx Machine, Harvest Combined Trust, Jakes Gerwel Fellowship, Justice Rising UK and Justice Rising International, Karudeca Program, Kizazi, Educate for Girls, Labhya Foundation, Lead For Ghana, Learn To Play, Labhya Foundation, Malaika Foundation, Malala Fund, Many Hats Institute, mindSpark Learning, Mobiles for Education Alliance, Murli T Chellaram Foundation alongside the Nirmala Chellaram Centre for Entrepreneurship Skills, University of Lagos, No Box Initiative, Paper Boat, Power Teachers, Pratham Education Foundation, Prige Consultants, Project Elimu, Queen Rania Teacher Academy, ReachingU, A Foundation for Uruguay, Rodrigo Mendes Institute, SELinEdu, Slam Out Loud, Snapplify Foundation, STiR Education, Suradnici u uÄ enju, Take Action Global, Teach A Man To Fish, TEACH Cote d'Ivoire, Teach For Malaysia, Teach For Uganda, Teach To Lead - Teach For India & Firki, The Akanksha Foundation, The Center for Innovation, The Citizens Foundation, The Commonwealth Education Trust, The Luminos Fund, The Pace Centre, United World Schools, Worldreader, Fundacion 99, SeedScience, CCeducare Myanmar, Challenge Partners, Fidal Foundation, Teach for Nigeria.

Turning to technology

A global survey of teachers'
responses to the Covid-19 pandemic



Visit: T4.education
Contact us: hello@T4.education