

April 2022

ARE WE TRULY ALL IN THIS TOGETHER?

THE IMPACT OF COVID-19 ON SOCIO-ECONOMIC INEQUALITY IN EDUCATION IN THE U.K.

WRITTEN BY ROMY OOMENS

EXECUTIVE SUMMARY

In order to contain the spread of the coronavirus, schools were forced to close their doors and provide remote education. Children of lower socio-economic status seem to have been affected most by this measure: they lacked the necessary parental resources and support to work effectively from home. As a result, the attainment gap between the disadvantaged and advantaged has widened in Northwestern-Europe, especially in this policy brief's country of interest: the unequal United Kingdom. What is worse? The prospects of these disadvantaged U.K. children are considered even poorer: the school closures are likely to impact their educational progression in the long-term, they are predicted to have a more precarious position on the labour market in the future, and they are expected to counter the growing socio-economic inequality in educational career. If the U.K. wants to counter the growing socio-economic inequality in education that hampers their social mobility levels, it must take action now. Recommendations include enhancing parents' digital skills, investing in study places outside the home, and offering additional support to disadvantaged children.

INTRODUCTION

The COVID-19 pandemic has had a destructive **primary effect** on people worldwide, with deteriorating health and mortality as a result [1]. Apart from this primary effect, **secondary effects** are also being felt on a global scale, of which the effect on education is arguably one of the most profound [2]. In order to prevent the spread of the virus and protect the most vulnerable, many countries imposed a **nationwide closure of educational facilities** [3]. While the disruption in physical education has impacted all learners from pre-primary to tertiary educational level, it has disproportionately affected those of a **lower socio-economic background** [1].

To minimize the learning loss resulting from school closures, schools decided to deliver **remote teaching** by offering online classes, supervision and materials [4]. As living rooms turned into classrooms, the key role that schools usually play in creating equal opportunities for everyone diminished [4]. Families were forced to take charge of their children's schooling by providing the necessary **resources and support**, which increased learning inequalities generated by family backgrounds [4].

This became especially apparent in countries with large, already existing socio-economic inequalities, such as the U.K. [5, 6]. Here, **social mobility** has regressed instead of risen over the years as a result of the massive expansion of the British education system [5, 6].

Box 1 - What is social mobility?

Social mobility is defined as 'a person's ability to move to a different social class' [7]. If there is high social mobility in a country, it means that one's potential, merit and choices determine their outcomes in life instead of their social background [8]. Education is seen as one of the main drivers of social mobility: if there are high levels of educational inequality, social mobility is therefore also likely to be low [9].

THE SOCIAL STRUCTURE OF WESTERN SOCIETIES

To indicate the severity of the issue: the U.K. ranked 21st for social mobility in the World Economic Forum's index, **in particular because of the country's poor scores on measures of educational equality** [8]. This makes the U.K. the poorest scoring country in the entirety of Northwestern Europe, with a value difference of over 10 points compared to the highest-scoring country: Denmark (see **figure 1**).



VALUE ON THE SOCIAL MOBILITY INDEX

Figure 1: The ranking of all Northwestern European countries from highest to lowest scores on the Social Mobility Index (0-100) of 2020. Higher scores indicate greater social mobility.

Source: World Economic Forum, 2020

Since the school closures have only reinforced these pre-existing socio-economic inequalities in education, it has become even harder for disadvantaged children to climb the social ladder in the U.K. With this policy brief, I have therefore aimed to look more deeply into the exact causes and consequences of the increasing educational inequalities in order to prevent a generational catastrophe in the U.K.

THE BRITISH CONTEXT 😹

Although social mobility increased in the nineteenth century as a result of the Industrial Revolution [10], it appears to be on a decline again in contemporary British society [5, 6]. A major reason for this is the **expansion of the education system** that has happened over the last four decades [5]. This expansion of (predominantly higher) education was expected to improve equality of opportunity of *all* socio-economic groups, but it has disproportionately benefited children from privileged families [5, 6]. Why?



Their chances of gaining a good qualification increased more significantly than the chances of the underprivileged, because they were the ones that could afford to remain in the educational system for a longer period of time [5, 6]. This shows that parental income and status became more important determinants of one's educational outcome, and thus indirectly of one's success on the labour market, than before [5].

THE SOCIAL STRUCTURE OF WESTERN SOCIETIES

Social mobility has been high on the political agenda of the U.K. ever since, with social policies aimed to minimize the impact of family background on education as a result [9]. Despite this, socio-economic inequalities in education have remained. **There is a huge attainment gap:** those from disadvantaged backgrounds are twice as likely to leave formal education without **GCSEs** in English and math compared to classmates with advantaged backgrounds [11]. Moreover, children of lower socio-economic status who achieve high marks at primary school end up 20% less likely to achieve top marks than children of higher socio-economic status who had similar previous marks before [11]. This is alarming, considering that these GCSEs are fundamental to young people's employment and education prospects in the U.K [12].



ο

Box 2 - The GCSE's

GCSE stands for 'General Certificate of Secondary Education'. At the end of compulsory education, most pupils aged 14 to 16 will take this qualification in several subjects, of which English, math and science are compulsory. The results are very important, as many employers and colleges require a minimum of 5 GCSEs at a certain level [13].

Time away from school is known to only widen this existing attainment gap: during breaks from school, such as summer holidays, children of lower socio-economic status fall even further behind [11]. The school closures during the COVID-19 pandemic, in which pupils are learning from home but in extremely different working environments, are thought to have had a similar effect [11]. Therefore, we must look further into this widening attainment gap that will result in even lower social mobility levels in the U.K.

THE DISPROPORTIONATE EFFECT OF SCHOOL CLOSURES

To ensure the continuity of learning in a period of societal 'lockdown', schools in the U.K. switched to remote teaching as a substitute for in-person classes [14]. While this is less impactful than the complete disruption of learning, the adoption of distance education has still led to an **overall learning loss** [14, 15]. This learning loss is alarming, because of <u>two reasons</u>:

- 1. Students' cognitive gains are expected to be affected in the long-term [4].
- 2. Children from lower socio-economic backgrounds are **disproportionately** affected, increasing the socioeconomic inequality in education [4].

In this policy brief, the main focus lies on further investigating the second reason. Why is it that children of parents with a lower socio-economic status are affected more than others? Research so far draws upon two different reasons related to the major role that families play during school closure: **lack of parental resources and lack of parental support** [14].

LACK OF PARENTAL RESOURCES PRIVATE STUDY SPACE

Children from lower socio-economic backgrounds tend to live under deprived conditions: **they reside in small houses that are not conducive to learning** [4]. Since they have to work in a small space along with their other family members, they cannot shut off exterior distractions [14]. This is expected to lead to a loss of focus, which means that the disadvantaged pupils get less (qualitative) work done than their more privileged peers.

What does research so far say?

- A study conducted in the U.K. showed that almost **60%** of primary school students of lower socio-economic background do not have access to their own dedicated study space, compared to only **35%** of the students of higher socio-economic backgrounds [17].
- **Private study spaces have not become more accessible throughout the pandemic,** which is not surprising: it is hard for parents of lower socio-economic status to suddenly generate more space at home [18]. Therefore, this issue remains substantial once schools are closed down again.

DIGITAL ACCESS

Even in higher-income countries such as the U.K., a **digital divide** remains: there is a division between people who have access to digital devices and those who do not [19]. Children from lower socio-economic backgrounds are **digitally excluded** more often: they tend to lack good internet access, and/or the necessary equipment to engage in effective home learning [4]. If they do have access, their **access is generally conditional**: children have to share their device or cannot maintain the use of the device [20]. Moreover, they might engage in remote learning through a **mobile phone or tablet instead of a laptop**, which is less convenient due to the screen size and the small keyboard [19]. Since remote education has only proven to be effective once students have consistent access to both the internet and computers, the experienced digital inequality widens the existing attainment gap between advantaged and disadvantaged pupils even more [21].

What does research so far say?

- Data on U.K. households from just before the pandemic shows that 9% of households with children lacked access to a laptop, desktop, or tablet; 2% had no access to the internet and 4% had smartphone only access.

Once again, children of lower socio-economic status were more affected: **21% of these children had no home access to a laptop or a desktop or a tablet, with 6% having no access to internet at home, and 9% having smartphone only internet access.** This shows that they will be more affected by digital exclusion during the school lockdowns [19].

• During the second round of school closures in the U.K. (February/March 2021), policy-makers had introduced **programmes to deal with the digital inequality:** the government had dispatched 1.3 million devices by July 2021 [22]. This has clearly worked to reduce digital inequality: there has been a **large improvement in the number of pupils with sufficient digital access in the second round of closure** [18].



LACK OF PARENTAL SUPPORT DIGITAL SKILLS

Access to digital resources can only contribute to students' achievements once parents serve as effective instructors in the use of these resources [23]. Unfortunately, parents of lower socio-economic backgrounds generally **use only a small array of digital devices and also lack the necessary digital skills** [24]. A recent report shows that some are not even able to send emails or find information online [14]. As a result, these parents are less able to assist their children in dealing with the technical challenges of online learning than parents from advantaged backgrounds [14]. While this is detrimental for all, the lack of support is particularly damaging for younger children, since they are unlikely to be able to deal with online education on their own [14].

AMOUNT OF TIME AT HOME WITH CHILDREN

The **amount of time** that parents could devote to supporting their children's home schooling also differed, depending on one's ability to work from home [23]. Parents of lower socio-economic status are significantly less able to do so (see **figure 2**) [14]. While balancing remote education with remote work is not easy, parents of higher socio-economic status are therefore still expected to have had more time to help their children with online learning [25]. The invested time in assistance positively impacts the children's home environment, and thus their learning outcomes [25], increasing the attainment gap between the disadvantaged and the advantaged even more.



of the workers with a high income could work from home

of the workers with a low income could work from home



Figure 2: The percentage of people who can work from home per income group. Source: DiPrieto et al., 2020 (Data from Economic Policy Institute)



What does research so far say?

- A study in England asked teachers to report the most important reasons why children do not engage in online learning. **Out of all reasons, having limited or no parental support was reported most (60%)** [25].
- Parents thought it was easier to support children at home during the second closure in the U.K., with **51%** of parents agreeing with the statement 'It's been easier to home school this lockdown compared to the first lockdown last year' [25].
 - \rightarrow

Presumably, this has more to do with the fact that schools improved their digital provision, than with actual increases in the ability of parents to help out their children [25]. Therefore, there remains much room for improvement.



Box 3 - Who has been hit the hardest?

It is important to note that children of lower socio-economic status are not the only ones who have been disproportionately affected. Children in **single-parent families** tend to suffer too, as an additional burden is placed on single parents: they will have little time and resources to promote home learning [4]. **Ethnic minorities** also suffer greater hardship, as their parents may have limited resources and less knowledge of the learning material [4]. These inequalities can add up when one belongs to multiple of these disadvantaged categories: this is called **intersectionality** [16].

Box 4 - Other factors

Policy-makers should not forget that there are other factors that play an important role in exacerbating the existing educational inequalities as well. **Schools,** for example, differ in terms of their provision of distance teaching and home learning guidance [4]. Since disadvantaged pupils tend to go to the schools with the worst digital infrastructure and low-quality teachers, they suffer from school closures even more than expected based solely on the research outlined before [26, 27].

Situating the U.K. in a wider context

While the U.K. is the most unequal country in Northwestern-Europe, it still tends to be more equal than Eastern-European countries [28]. Therefore, disadvantaged children who are forced to follow online education are even worse off there [29].

IMPLICATIONS

The research outlined above shows that U.K. students face unequal barriers in terms of online education, because of differences in parental resources and parental support. Although we already know that this has widened the attainment gap between advantaged and disadvantaged pupils [14, 15], long-term consequences of the school closures are not as clear yet [30]. Despite this, I will try to provide predictions of the future based on the evidence up until this point.

1 LONG-TERM EFFECTS ON EDUCATIONAL PROGRESSION

The school disruptions during the lockdown are thought to have long-term effects on the educational progression of children, especially of the disadvantaged ones [31]. The great learning losses that have resulted from their disengagement in learning are hard to fully compensate, which is thought to lead to **academic underachievement** throughout their educational career [30]. Moreover, the repeated school closures might have declined their educational aspirations, making them more likely to **dropout** later [32]. All in all, this shows just how persistent the problem will be throughout their education.

WORSENING LABOUR MARKET OUTCOMES

If these disadvantaged students indeed attain less and drop out more often, they will have an **even worse position on the labour market than prior disadvantaged students** [31]. After all, educational qualifications are regarded as the main asset in competition for jobs on the labour market nowadays [33]. This is very concerning, considering the fact that young, disadvantaged people already had a fragile position on the labour market before: a position characterized by temporary, low-income jobs and high unemployment levels [34]. If learning losses are not compensated, the disadvantaged youth will thus not only be bearing the brunt of the educational crisis, but also of the greatest labour market crisis since the Second World War [34].

03

INCREASING IMPACT OF DIGITAL INEQUALITIES IN THE FUTURE

While schools have finally re-opened in the U.K., there is a growing concern that **remote** education may be necessary again in the future: whether because of broader COVID-19 surges or another pandemic [35, 36]. Some even suggest that digital education may become the norm for education post-COVID, as people see the advantages of remote education more clearly now [37, 38]. Such a shift to (more) digital education is thought to only increase the impact of digital inequalities, with heightened socio-economic inequalities in educational outcomes as an inescapable result [37].

RECOMMENDATIONS

While the phrase 'we're all in this together' has been used quite a lot in the public debate on COVID-19, the state-of-the-art research has clearly shown that vulnerable children have been harmed significantly more by the physical school closures than others. Unfortunately, it is likely that scar tissue will remain: these closures are thought to impact their socio-economic outcomes long after the virus has passed, which makes it even harder for them to climb the social ladder in the U.K. than before. On top of that, we have seen that the issue might only become worse, as future lockdowns and a complete or partial switch to online education are likely. Policy-makers should therefore urgently prepare to offset the widening attainment gaps between children of lower and higher socio-economic status, before the issue becomes even more pressing.

The findings of this policy brief clearly stress that home learning should be made more equal from now on, and that already existing gaps as a result of the pandemic should be reduced. Therefore, I suggest policy-makers to take the following corresponding actions:

IMPROVE PARENTS' DIGITAL SKILLS

Training should be provided to parents of lower socio-economic status, as to improve their poor digital skills. Much attention has been paid to the enhancement of teachers' and students' digital skills already [19], but parents play a great role in assisting their children with online education too. If they are taught the needed digital skills, it allows them to support their children more adequately when schools close again - whether because of new virus surges or voluntary switches to online education.

PROVIDE QUIET STUDY PLACES FOR CHILDREN OUTSIDE THE HOME

Children of lower socio-economic status tend to live in smaller houses that do not provide the space to study privately, which negatively impacts their achievement. Since it is fairly impossible for parents to arrange more space *at home*, enough quiet study places must be created *outside the home* so that these pupils can study in silence too. The government should guarantee that each municipality is able to provide sufficient places, so that all children can work without external distractions in the future.

OFFER EXTRA RESOURCES AND SUPPORT TO STUDENTS TO HELP THEM CATCH-UP

Children of lower socio-economic status have already experienced a greater learning loss than their more advantaged counterparts. To reduce this attainment gap, schools must provide extra resources and support to those affected most. This can happen in two ways:

- If schools are not opened (yet), **free one-on-one tuition** can be provided online to those in need of the extra support.
- Once schools are opened physically again, they must provide 'catch-up' classes to disadvantaged students, preferably after the regular classes.

The costs of these interventions should be set against the high societal costs of a high dropout rate, academic underperformance and limited labour market opportunities of the disadvantaged youth [32].

THE SOCIAL STRUCTURE OF WESTERN SOCIETIES

REFERENCES

- 1. Ribarovska, A. K., Hutchinson, M. R., Pittman, Q. J., Pariante, C., & Spencer, S. J. (2021). Gender inequality in publishing during the COVID-19 pandemic. *Brain, behavior, and immunity*, *91*, 1.
- 2. Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International journal of surgery*, *78*, 185-193.
- 3. UNESCO. (2020). *Educational Disruption and Response*. Retrieved from: <u>https://en.unesco.org/covid19/educationresponse</u>
- 4. Bayrakdar, S., & Guveli, A. (2020). *Inequalities in home learning and schools' provision of distance teaching during school closure of COVID-19 lockdown in the UK* (ISER Working Paper No. 2020-09). Retrieved from ECONSTOR website: <u>https://www.econstor.eu/bitstream/10419/227790/1/1703719352.pdf</u>
- 5. Machin, S., & Vignoles, A. (2004). Educational inequality: the widening socio-economic gap. *Fiscal Studies*, *25*(2), 107-128.
- 6. Blanden, J., & Machin, S. (2013). Educational inequality and the expansion of UK higher education. *Scottish Journal of Political Economy*, *60*(5), 578-596.
- 7. Collins. (n.d.). Social mobility. In *Collins English Dictionary*. Retrieved from: <u>https://www.collinsdictionary.com/dictionary/english/social-mobility</u>
- 8. Social Mobility Commission. (2021). *State of the nation 2021: Social mobility and the pandemic*. Retrieved from:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/100397 7/State_of_the_nation_2021_-_Social_mobility_and_the_pandemic.pdf

- 9. Brown, P. (2013). Education, opportunity and the prospects for social mobility. *British Journal of Sociology of Education*, *34*(5-6), 678-700.
- 10. Maas, I., & Van Leeuwen, M. H. (2016). Toward open societies? Trends in male intergenerational class mobility in European countries during industrialization. *American Journal of Sociology*, *122*(3), 838-885.
- Cullinane, C., & Montacute, R. (2020). COVID-19 and social mobility impact brief #1: School closures. Retrieved from The Sutton Trust website: <u>https://www.suttontrust.com/wp-</u> <u>content/uploads/2021/01/School-Shutdown-Covid-19.pdf</u>
- 12. Wolf, A. (2011). *Review of vocational education: the Wolf report*. Retrieved from http://www7.bbk.ac.uk/linkinglondon/resources/fehe-policy-and-advocacy/report_Feb2011_The_Wolf Report1.pdf
- 13. Nidirect. (n.d.). GCSEs. Retrieved from <u>https://www.nidirect.gov.uk/articles/gcses#:~:text=GCSE%20stands%20for%20General%20Certificate,subjec</u> <u>ts%20also%20involve%20practical%20work</u>.
- 14. Di Pietro, G., Biagi, F., Costa, P., Karpiński, Z., & Mazza, J. (2020). The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets (Report No. JRC 30275). Retrieved from JRC website: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC121071/jrc121071.pdf?

mc_cid=ecbb7c6ba9&mc_eid=26e959399a.

- 15. United Nations. (2020). Education during COVID-19 and beyond. Retrieved from: <u>https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf</u>
- 16. Bowleg, L. (2020). We're not all in this together: On COVID-19, intersectionality, and structural inequality. *American journal of public health*, *110*(7), 917-917.
- Andrew, A., Cattan, S., Costa-Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., & Sevilla,
 A. (2020). *Learning during the lockdown: Real-time data on children's experiences during home learning*.
 London, England: Institute for Fiscal Studies.

REFERENCES

18. Cattan, S., Farquharson, C., Krutikova, S., Phimister, A., Salisbury, A., & Sevilla, A. (2021). *Home learning experiences through the COVID-19 pandemic* (Report No. IFS R195) Retrieved from the Institute for Fiscal Studies website: <u>https://ifs.org.uk/uploads/R195-Home-learning-experiences-through-the-COVID-19-pandemic.pdf</u>

19. Coleman, V. (2021). *Digital divide in UK education during COVID-19 pandemic: Literature review*. Retrieved from Cambridge Assessment website: <u>https://www.cambridgeassessment.org.uk/Images/628843-digital-divide-in-uk-education-during-covid-19-pandemic-literature-review.pdf</u>

20. Van Dijk, J. A. G. M. (2020). *The digital divide*. Cambridge, England: Polity Press.

21. Garcia, E., & Weiss, E. (2020). *COVID-19 and student performance, equity, and U.S. education policy*. Retrieved from Economic Policy Institute website: <u>https://www.epi.org/publication/the-consequences-of-the-covid-19-pandemic-for-education-performance-and-equity-in-the-united-states-what-can-we-learn-from-pre-pandemic-research-to-inform-relief-recovery-and-rebuilding/</u>

22. UK Government. (2021). *Laptops and tablets data*. Retrieved from: <u>https://explore-education-</u> <u>statistics.service.gov.uk/find-statistics/laptops-and-tablets-data/2021-week-28#dataDownloads-1</u>

23. Vigdor, J. L., Ladd, H. F., & Martinez, E. (2014). Scaling the digital divide: Home computer technology and student achievement. *Economic Inquiry*, *52*(3), 1103-1119.

24. Zhang, D., & Livingstone, S. (2019). *Inequalities in how parents support their children's development with digital technologies*. Retrieved from LSE Department of Media and Communications website:

http://www.lse.ac.uk/media-and-communications/assets/documents/research/preparingfor-a-digitalfuture/P4DF-Report-4.pdf

25. Montacute, R. & Cullinane, C. (2021). *Learning in lockdown*. Retrieved from The Sutton Trust website: <u>https://dera.ioe.ac.uk/37194/1/Learning-in-Lockdown.pdf</u>

26. West, A., & Pennell, H. (2000). Publishing school examination results in England: incentives and consequences. *Educational Studies*, *26*(4), 423-436.

27. Hobbs, G. (2016). Explaining social class inequalities in educational achievement in the UK: quantifying the contribution of social class differences in school 'effectiveness'. *Oxford Review of Education*, *42*(1), 16-35.

28. Van Dijk, J. A. G. M. (2009). One Europe, digitally divided. In A. Chadwick and P. N. Howard (Eds.), *Routledge handbook of Internet politics* (pp. 288–305). London, England: Taylor & Francis.

29. Bormann, I., Brøgger, K., Pol, M., & Lazarová, B. (2021). COVID-19 and its effects: On the risk of social inequality through digitalization and the loss of trust in three European education systems. European *Educational Research Journal, 20*(5), 610–635.

30. Reimers, F. M., Schleicher, A., & Ansah, G. A. (2020). *Schooling disrupted, schooling rethought: how the COVID-19 pandemic is changing education*. Retrieved from OECD website: <u>https://read.oecd-ilibrary.org/view/?</u> ref=133_133390-1rtuknc0hi&title=Schooling-disrupted-schooling-rethought-How-the-Covid-19-pandemic-is-changing-

<u>education&utm_source=Adestra&utm_medium=email&utm_content=Learn%20more&utm_campaign=OECD%2</u> <u>OEducation%20%26%20Skills%20Newsletter%3A%20June%202020&utm_term=edu</u>

31. Blundell, R., Cribb, J., McNally, S., Warwick, R., & Xu, X. (2021). *Inequalities in education, skills and incomes in the UK: the implications of the COVID-19 pandemic*. Retrieved from the Institute for Fiscal Studies website: <u>https://www.thebritishacademy.ac.uk/documents/3024/COVID-decade-inequalities-education-skills-incomes-</u>

UK-Institute-Fiscal-Studies.pdf

REFERENCES

32. Darmody, M., Smyth, E., & Russell, H. (2021). Impacts of the COVID-19 control measures on widening educational inequalities. *Young*, *29*(4), 366-380.

33. Gangl, M. (2000). *Education and labour market entry across Europe: the impact of institutional arrangements in training systems and labour markets* (MZES Working Paper No. 25). Retrieved from Manheimer Zentrum für Sozialforschung website: <u>http://edoc.vifapol.de/opus/volltexte/2014/5119/pdf/wp_25.pdf</u>

34. International Labour Organization. (2020). *Preventing exclusion from the labour market: tackling the COVID-19 youth unemployment crisis*. Retrieved from ILO website: <u>https://www.ilo.org/wcmsp5/groups/public/---</u> <u>ed_emp/documents/publication/wcms_746031.pdf</u>

35. Hinde, N. (2021, March 17). Here's what experts think will happen to COVID coming winter [Blog post]. Retrieved from: https://www.huffingtonpost.co.uk/entry/will-covid-be-back-in-

winter_uk_604b78f4c5b65bed87da0d7c

36. Tollefson, J. (2020). Why deforestation and extinctions make pandemics more likely. *Nature, 584*(7820), 175-177.

37. Fleming, N. (2021, 23 January). *After COVID, will digital learning be the new normal?* The Guardian. Retrieved from: https://www.theguardian.com/international

38. Lockee, B. B. (2021). Online education in the post-COVID era. Nature Electronics, 4(1), 5-6.