



Briefing note Inequalities in resources in the home learning environment

Prepared by Laura Outhwaite



Key Points

- Since 23rd March 2020, UK schools have been closed for most children due to the Covid-19 pandemic. Consequently, there is a greater emphasis on the implementation of children's education by parents at home. There are concerns that the impact of school closures will disproportionately impact children from lower socio-economic backgrounds.
- Families from poorer backgrounds are more likely to face barriers in the home learning environment, such as:
 - reduced access to technological devices;
 - less likely to have access to reliable and fast Internet connection;
 - reduced access to physical space, and
 - lower levels of adult numeracy and literacy may also make it harder for parents to support their child.

Recommendations

In supporting learning at home, focus on quality of activity, rather than absolute quantity:

- Policy makers should ensure that all children have access to a variety of different resources, including books (especially fiction), online learning platforms, educational apps, TV programs, and paper-based activities
- Parents, if possible, should co-view educational technology resources, especially with younger children and consider whether their language abilities allow them to understand the learning content in this medium

The Issue

Since 23rd March 2020, UK schools have been closed for most children due to the COVID-19 pandemic. Consequently, there is a greater emphasis on the implementation of children's education by parents at home, as well as perhaps a greater reliance on access to educational technologies. There are concerns that the impact of school closures will disproportionately impact children from lower socio-economic backgrounds and widen the attainment gap between them and their peers from more affluent backgrounds (Montacute, 2020).

This briefing note summarises the empirical evidence on inequalities in 1) the home learning environment and 2) resources, including educational technologies, which may affect access to education during these challenging times.

Inequalities in the Home Learning Environment

Using the Avon Longitudinal Study of Parents and Children (ALSPAC), Dickson, Gregg, and Robinson (2016) found increases in maternal education level had a positive causal effect on child attainment outcomes at 4-16 years. Macmillan and Tominey (2019) expanded on this study by examining some of the mechanisms driving this effect. Results showed increased maternal education supported higher family income and increased parental investments in educational resources, such as toys and books in the home. These mechanisms were identified as significant predictors of increased child literacy and mathematical skills at ages 4-7 years.

Similar results have been observed in the Millennium Cohort Study (MCS), a longitudinal dataset representative of the UK population. Sullivan, Ketende and Joshi (2013) found parental education qualifications were consistently the strongest predictor of a child's combined test scores in reading, mathematics, and problem solving at age 7, followed by social class categories and parental income. Self-reported home learning environment activities,

including TV viewing (although content was unknown), reading to the child, library visits, and teaching the alphabet, also made significant (but smaller) contributions to child outcomes.

Further findings from the MCS by Del Bono et al. (2016), showed mothers with higher levels of education (e.g. a university degree) spend more time, on average, engaging with the child's learning at home, compared to mothers with no qualifications. In turn, this engagement is linked to increased child literacy and socio-emotional outcomes between ages 3-7 years.

In a recent report from Ireland, in response to the COVID-19 pandemic, Doyle (2020) found there was little difference by levels of parental education in the amount of time per day parents are currently engaged in home schooling. However, the average time spent on home schooling, approximately 1-2 hours per day, is significantly less than the typical school day. Working parents also reported that it is placing significant demands on their time as they attempt to achieve a balance between work and supporting home learning with their children. Given such time pressures, it appears to be important to focus on the quality of children's home learning, rather than simply the quantity. The evidence discussing quality, rather than quantity of home learning is presented later in this briefing note.

Inequality in Access, Ability, and Anxiety

Using data from the Longitudinal Study of Young People in England (LSYPE), Chowdry, Crawford and Goodman (2009) found significant socio-economic differences in families' computer and internet access, with 97% of the richest fifth of the population having access to these resources, compared to 46% of the poorest fifth. Access to these material resources in the home were important in explaining, in part, the significant gap in attainment between children from low and high socio-economic backgrounds.

More recent statistics have shown an improve-

-ment in access to technology devices that could be used for educational purposes at home. 88% of 6-17-year olds own or have access to a computer or laptop and 85% own or have access to a touch-screen tablet (YouGov, 2019). This dataset did not include any data about socio-economic related differences.

However, owning or having access to technological devices is not enough. Access to a reliable and fast Internet connection is recognised as a key barrier to the effective use of educational technology in schools (McFarlane, 2019) and this will also hold true for the home learning environment. Children also need the physical space in which to carry out home learning activities and those from lower socio-economic backgrounds may be at greater risk of these additional barriers (Doyle, 2020).

Furthermore, the impact of low parental education may mean that parents from low socio-economic backgrounds are less likely to have the basic skills needed to be able to engage with learning materials and support their children's learning at home. A study by National Numeracy (2019) found that only 22% of working-aged adults are functionally numerate, defined as equivalent to a GCSE pass (Grade 4/C) or above, and 57% are functionally literate.

Parents may also hold their own anxieties towards learning, particularly in mathematics (Malanchini et al., 2017). Statistics suggest 20% of adults in the UK feel anxious when confronted with a mathematical problem (Maths Anxiety Trust, 2018), although there is little data on socio-economic differences in maths anxiety (Dowker, Sarkar, & Looi, 2016). Maloney et al. (2015) found that early school-aged children of maths-anxious parents learnt significantly less maths and reported their own higher maths anxiety over the school year, but only when maths-anxious parents provided frequent and well-meaning help with homework. Parental maths anxiety was not found to affect children's reading development.

Quality, rather than Quantity

When considering the evidence surrounding children and adolescents' use of educational technology in the home learning environment, it is important to focus on the content and context of these interactions, rather than just the 'amount of time' spent on devices (Blum-Ross & Livingstone, 2016).

In a systematic review of 35 studies, Griffith et al. (2020) found interactive educational apps for children aged 6 years and under had positive impacts on children's academic outcomes, particularly in mathematics. Experimental research by Schaeffer et al. (2019) found the use of an educational maths story app, that encouraged engagement between parent and child, benefitted young children's mathematical outcomes, particularly for those whose parents reported high levels of maths anxiety.

In a further systematic review and meta-analysis of 42 studies, Madigan et al. (2020) found quality screen time, defined as educational programmes and co-viewing with caregivers, was positively associated with language skill development of children aged 12 years and under. For young children and educational apps, experimental research by Outhwaite, Gulliford and Pitchford (2020) highlights the importance of considering the individual child's language abilities – can they effectively understand and access the learning content in this format?

Other systematic reviews, such as Lai and Bower (2019), that focused on a wider age-range of students, found educational technologies that are student-centred, gamified, and included collaborative feedback and school-level support, had strong benefits for learner outcomes, as well as improved motivation, satisfaction, and enjoyment of the learning experience.

This focus on educational content is also important to consider with non-technology-based resources. Using Programme for International Student Assessment (PISA) data from 35 countries, Jerrim and Moss (2018) found the frequency with which teenagers read fiction

books was positively associated with their attainment. Higher rates of reading other forms of text, such as comics, newspapers, and magazines, did not have the same association with reading skills.

Summary and Implications

In summary, there are many potential layers of influence that cause inequalities in the home learning environment, including low levels of parental education and household income constraints. Research consistently demonstrates a strong intergenerational association between these parental factors and child outcomes.

Families from lower socio-economic backgrounds with lower levels of parental education and household income, coupled with the stress of living in poverty (Bradley & Corwyn, 2002), may experience several challenges in supporting their child's home learning. For example, limited access to resources, including technological devices that can be used to facilitate learning and a reliable and fast Internet connection.

Low levels of adult numeracy and literacy, as well as anxieties towards learning, particularly in mathematics, may also pose significant challenges for parents/caregivers supporting their child's home learning during school closures. Current evidence suggests it is important to focus on the quality of children's home learning, rather than simply the quantity.

References

- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53(1), 371-399.
- Blum-Ross, A., & Livingstone, S. (2016). *Families and screen time: Current advice and emerging research*. Available from: <http://eprints.lse.ac.uk/66927/1/Policy%20Brief%2017-%20Families%20%20Screen%20Time.pdf>
- Chowdry, H., Crawford, C., & Goodman, A. (2009). *Drivers and barriers to educational success-evidence from the Longitudinal Study of Young People in England*. Available from: <https://discovery.ucl.ac.uk/id/eprint/18314/1/18314.pdf>
- Del Bono, E., Francesconi, M., Kelly, Y., & Sacker, A. (2016). Early maternal time investment and early child outcomes. *The Economic Journal*, 126(596), F96-F135.
- Dickson, M., Gregg, P., & Robinson, H. (2016). Early, late or never? When does parental education impact child outcomes?. *The Economic Journal*, 126(596), F184-F231.
- Dowker, A., Sarkar, A., & Looi, C. Y. (2016). Mathematics anxiety: What have we learned in 60 years?. *Frontiers in psychology*, 7(508), doi:10.3389/fpsyg.2016.00508.
- Doyle, O. (2020). *COVID-19: Exacerbating Educational Inequalities?* Available from: <http://publicpolicy.ie/papers/covid-19-exacerbating-educational-inequalities/>
- Griffith, S. F., Hagan, M. B., Heymann, P., Heflin, B. H., & Bagner, D. M. (2020). *Apps as learning tools: a systematic review*. *Pediatrics*, 145(1), e20191579, doi.org/10.1542/peds.2019-1579
- Jerrim, J., & Moss, G. (2019). The link between fiction and teenagers' reading skills: International evidence from the OECD PISA study. *British Educational Research Journal*, 45(1), 181-200.
- Lai, J. W., & Bower, M. (2019). How is the use of technology in education evaluated? A systematic review. *Computers & Education*, 133, 27-42.
- Macmillian, L., & Tominey, E. (2019). *Parental inputs and socio-economic gaps in early child development*. Available from: <https://econpapers.repec.org/paper/uclcepe-ow/20-04.htm>
- Madigan, S., McArthur, B. A., Anhorn, C., Eirich, R., & Christakis, D. A. (2020). *Associations Between Screen Use and Child Language Skills: A Systematic Review and Meta-analysis*. *JAMA Pediatrics*, doi:10.1001/jamapediatrics.2020.0327
- Malanchini, M., Rimfeld, K., Shakeshaft, N. G., Rodic, M., Schofield, K., Selzam, S., ... & Kovas, Y. (2017). The genetic and environmental aetiology of spatial, mathematics and general anxiety. *Scientific reports*, 7(42218), doi:10.1038/srep42218
- Maloney, E. A., Ramirez, G., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2015). Intergenerational effects of parents' math anxiety on children's math achievement and anxiety. *Psychological Science*, 26(9), 1480-1488.
- Maths Anxiety Trust (2018). *Maths Anxiety Summit 2018*. Available from: <https://www.learnus.co.uk/Maths%20Anxiety%20Summit%202018%20Report%20Final%202018-08-29.pdf>
- McFarlane, A. (2019). *Growing up digital: What do we really need to know about educating the digital generation?* Available from: <https://www.nuffieldfoundation.org/sites/default/files/files/Growing%20Up%20Digital%20-%20final.pdf>
- Montacute, R. (2020). *Social Mobility and COVID-19*. Available from: <https://www.suttontrust.com/wp-content/uploads/2020/04/COVID-19-and-Social-Mobility-1.pdf>
- National Numeracy (2019). Building a numerate nation: confidence, belief and skills. Available from: https://www.nationalnumeracy.org.uk/sites/default/files/building_a_numerate_nation_report.pdf
- Outwaite, L. A., Gulliford, A., & Pitchford, N. J. (2020). Language counts when learning mathematics with interactive apps. *British Journal of Educational Technology*. Doi:10.1111/bjet.12912.
- Schaeffer, M. W., Rozek, C. S., Berkowitz, T., Levine, S. C., & Beilock, S. L. (2018). Disassociating the relation between parents' math anxiety and children's math achievement: Long-term effects of a math app intervention. *Journal of Experimental Psychology: General*, 147(12), 1782-1790.
- Sullivan, A., Ketende, S., & Joshi, H. (2013). Social class and inequalities in early cognitive scores. *Sociology*, 47(6), 1187-1206.
- YouGov (2019). *Four in ten British kids has their own tablet by age six*. Available from: <https://yougov.co.uk/topics/education/articles-reports/2020/03/13/what-age-do-kids-get-phones-tablet-laptops->

Image credits

Front: Chuck Underwood from Pixabay
Back: Jelleke Vanooteghem on Unsplash



Prepared by: Laura Outhwaite

Contact for further information:
Centre for Education Policy &
Equalising Opportunities (CEPEO)

www.ucl.ac.uk/ioe/cepeo

email: cepeo@ucl.ac.uk

Date: April 2020