The implications for teaching and learning in Key Stage 1 as a result of the Covid-19 pandemic

Ayesha Lohar, Liverpool Hope University, UK

Cathal O'Siochru, Liverpool Hope University, UK

Lead Author: Ayesha Lohar

Email: ayeshalohar786@gmail.com

This is an Accepted Manuscript of an article published in Educationalfutures on 22 June 2023, available online:

https://educationstudies.org.uk/journal/ef/volume-14-1-2023/

Abstract

In this paper we will argue that as part of their plans to phase out the Key Stage 1SATs (DfE, 2020), the government should consult with teachers to assess and evaluate the gaps in learning that have occurred and continue to occur in England as a result of the Covid-19 pandemic. Moreover, we hope to show that the pandemic has provided the perfect opportunity for the Department for Education (DfE) to utilise the research available on children's development with specific reference to the socio-cognitive context in order to redefine the attainment targets so that they better align with childhood development trajectories. Finally, we intend to show that the DfE should be considering the potential impact of digital devices on children's learning, as these have been used as a substitute for live lessons and can be used by parents and children to boost learning.

Keywords

KS1, SATs, pandemic, socio-cognitive development, digitisation

Introduction

The Corona Virus or Covid 19 pandemic has created a period of introspection in the work of many institutions important to the fabric of societies worldwide. Referring specifically to education, those living within neoliberal contexts such as England and the USA (Exley *et al.*, 2011) have found that progress in education cannot be judged against pre-pandemic criteria. For example, the implementation of school governance procedures that shape the school day in terms of how and what children are taught within an increasing competitive culture within classrooms and across schools, or the framing of education provision using measures of productivity and efficiency, no longer capture or reflect the lived experiences of children (Hall and Pulsford, 2019).

Furthermore, school closures as a result of the pandemic have caused concern for the UK Government in terms of the widening gaps in learning and attainment and the loss or reduction of effective learning behaviours in children, with the greatest impact being felt by children from economically disadvantaged backgrounds. While an education recovery programme was designed to fill in the gaps in learning, the strategy itself has run prior to any 'year group specific' learning and has been deemed a cramming exercise (Nelson, Lynch and Sharp, 2021). The recovery programme as described by the Department for Education (DfE) seeks to enable teachers to use their assessment tools to identify gaps in learning at the start of the academic year and provide instruction and interventions to bridge those gaps that have occurred due to missed content. The intention is that children make up for lost learning in the first term of the academic year before continuing onto the curriculum prescribed for that year group (DfE, 2021a; DfE, 2021b).

However, the timeframe for teachers to help children close the gaps due to missed learning is unrealistically narrow (NASUWT, 2023). The Education Endowment Foundation warns against cognitive overload and the importance of allowing children the time to practise newly learned strategies (EEF, 2018). Based on these assessments, we would argue that using the six to seven weeks at the start of the new school year to study a year's worth of curriculum is an ineffective method of ensuring children 'catch-up'. Instead, the government should reconsider what value there is in placing additional pressure on children and teachers to meet a national standard of attainment via the Key Stage 1 assessments during such an uncertain

period. Even though the pandemic restrictions have all been lifted in the UK, there are still going to be incidents of scattered attendance for both staff and pupils. Therefore, it is to be expected that there will be a continuation of a broken pattern of learning and so it makes little sense to assess young children through the Key Stage 1 SATs at this time.

Neoliberal policies towards mass education have been superficial to almost non-existent, resulting in many unable to improve their lives or fulfil their aspirations (Hutchings, 2015). While the installation of the National Curriculum has provided direction for classroom instruction, teachers have had to find ways to customise instruction to ensure children do not fall behind in terms of completing the curriculum. The pandemic has also created an opportunity for education to be more generally scrutinised under the lens of socio-cognitive theory and to be evaluated in terms of its purpose and contribution to society in line with the theories of Vygotsky and later Bruner. (Alexander, 2004). While this has long been an enduring source of debate and the question of how to manage the population continues to be raised no matter the social landscape (OECD, 2018), the change of circumstances within society resulting at the pandemic demands a reconsideration of education's role in society.

This paper will focus on how the pandemic has highlighted the gaps in young children's development, specifically children in England following the Key Stage 1 (hereafter KS1) curriculum. We have chosen to focus on this area of the National Curriculum because this is the point at which children at ages five to six encounter the formal curriculum, where children move from active participation in the learning process to passive recipients of whole class teaching (Browne and Wong, 2016). Within this context we will consider how the pandemic has brought to the fore the deficiencies children are experiencing living in a neoliberal society. We will also consider the impact of the changing social landscape with the increased use of digital devices, which featured heavily during the pandemic, as an artefact of culture (Henare, 2003).

What the pandemic has taught us about the KS1 curriculum

The influence of the pandemic on education in the UK has been widely researched, with impacts ranging from disrupting the transition from nursery to school (Bakopoulou, 2022) to an increase in mental health issues among HE students (Ihm, Zhang, van Vijfeijken, and Waugh, 2021). Despite the challenge that students faced transitioning to online learning, the

Education Endowment Foundation 2020 report noted that only half the parents surveyed reported helping their children with remote learning (Lucas, Neilson and Sims, 2020). Consequently, that same report warns that ten years of progress in reducing the attainment gap between advantaged and disadvantaged children is likely to be reversed as a result of the pandemic. Focusing onKS1, although children at this level have missed a significant amount of time at school as a result of the pandemic, they have still been required to undertake the SATs papers in English and Maths at the end of Year 2. A school day for a year two class of children is intense as they prepare for assessments that represent the knowledge and skills that these students should have accumulated throughout the two years of schooling. This attempt to cram the current curriculum to ensure attainment goals are achieved (Whiteside, 2016) represents an unnecessary addition to the general aftermath of the lockdowns. It ends up putting pressure on teachers and children to teach and learn in a way that is not only unnatural but also highly ineffective as noted by the OECD in their 2020 report (OECD,2020b).

The DfE has argued that KS1 assessments inform parents of the progress their children are making and whether this is in line with expected attainment nationally (DfE, 2018). In addition, they also work as an accountability measure enabling parents to compare schools and make decisions about their child's education provision. And yet, even before the pandemic education leaders and experts from field of child development were already arguing that the tests are unnecessary and damaging to young children's development. For example, McNess *et al.* (2007) found that children's social and cognitive development were being deprioritised as a consequence of preparing them for these assessments, while interviews revealed the pressure the children felt to complete the tests correctly. Furthermore, these tests focus on only one aspect of development, as opposed to the varying skills young children ought to be developing (Jeffrey, 2010; Martin, 2009). In addition to concerns over the assessments themselves, there is also widespread dissatisfaction among teachers regarding assessment workloads and the culture of performativity the assessments feed into (Ward, 2017).

With regards to participating in the 2022 SATs, it may be argued that there was a strong likelihood that as a result of the pandemic the majority of six- and seven-year-olds would not reach the desired levels of fluency and comprehension of long sentence structures to tackle the SATs papers (DfE, 2021b) without feeling a sense of anxiety (Quigley, 2020). At first glance,

the publication of the 2022 KS1 SATs results (DfE, 2022) supports this, reporting a decline in children's attainment of almost 10% across all assessed areas. The results in reading and writing demonstrate the impact the pandemic has had on comprehension and articulation, which is also required for the reasoning section of the maths assessment. Furthermore, the results from the Phonics Screening Check also highlight a decrease in children's ability to decode the written word (DfE, 2022) which is likely to lead to further delays in progress in reading and writing. It is also worth noting, that the desired levels of fluency and comprehension are not necessarily developmentally appropriate levels for six- and seven-year-olds (The Rochford Review: DfE, 2016b). This is particularly true in those cases where there has not been the exposure to a wide variety of texts, or where the students do not have an immersive reading culture at home to support the work being done at school. What this tells us is that students who are disadvantaged due to a lack of support at home, which were far more noticeable during the pandemic, will remain long after COVID, and we need to ensure they are not swept back under the rug as the virus recedes.

Another way in which the pandemic has disadvantaged students in their completion of the SATs are the reading fluency requirements. A quick overview of the KS1 SATs Reading Papers determines the level of reading fluency and comprehension skills required by children for them to achieve national standard (DfE, 2019). At best the vocabulary is somewhat alien to the children who have not experienced the contexts referred to. Yet, on the day of the assessment these children are required to read, comprehend and dissect the text for the purpose of answering a set of questions in varying formats. As a result of the pandemic, the current national cohort of year two children have not had enough experience of reading in school (The National Literacy Trust, 2021) let alone reading for the purpose of answering a varying assortment of questions.

We would agree that some students in this cohort have read regularly and, importantly, have been read to during the pandemic and have therefore been able to develop fluency and comprehension. However, there are many that have not had this interaction with their families, and this in turn has delayed the development of language and communication due to the absence of any such purposeful interaction with carers (Purcell-Gates, McIntyre and Freppon, 1995). While this is not a result of the pandemic entirely, the pandemic has brought to the forefront the struggles that families from lower socio-economic status are facing in

terms of providing continuity of some school activities at home. Thus, the pandemic highlights the critical importance of the link between home and school in terms of creating a partnership where parents can successfully contribute or continue the efforts of school to raise attainment. It should also allow for the DfE to re-evaluate how children and their families are experiencing education and the expectations placed on them.

The impact of the pandemic on literacy skills could be deemed significant, as these are the gateway to learning in schools and the chosen method of demonstrating attainment is other subject areas such as mathematics and science. Being able to read and comprehend a wide variety of texts enables children to dissect and respond to assessment questions with the confidence of the skills learned, no matter the context (Quigley, 2020). If during the pandemic, children have not had a rich experience of the spoken language, in terms of speaking and hearing about a variety of subjects, then reading and comprehension are going to prove slightly more challenging in the current circumstances (Alexander, 2019). In addition, children have not had access to community activities such as library visits or museums and parks as these have had to close, so children's experiences and opportunities to encounter new contexts have been non-existent.

An important element of the government's response to the impact of the pandemic on children's education has been the National Tutoring Programme (NTP), introduced in March 2022 by the DfE to help students catch up on missed learning (DfE, 2023). An evaluation by the Education Endowment Foundation later the same year reported that while there was some progress for both English and maths, not enough children participated to provide a complete picture of the programme's effectiveness (NFER, 2022). At the time of writing, the DfE has announced plans to continue to fund schools under this programme although at a reduced level, passing more of the cost of the programme on to the schools (DfE, 2023). It remains to be seen what difference this programme can make with regard to redressing the impact of the pandemic.

Another government education programme which also has the potential to help address this deficit in literacy skills is the 'ICAN' strategy to improve language and communication (DfE, 2018). This strategy views dialogue, not just as an intervention measure, but as an important aspect of developing literacy before recording thoughts and ideas as sentences in books. And yet, the Department for Education has decided that their Language Training programme

should only be offered to children in reception classes (DfE, 2021a). Thus, it would appear that the DfE believes that children by the age of five have completed the development of their language and comprehension skills. This is a tragically missed opportunity and, as the results from the 2022 KS1 SATs have demonstrated, it highlights what may occur if opportunities are not provided to develop children's language skills. Importantly it also suggests that evidence regarding the expansion of developmental gaps during these formative years (The Rochford Review: DfE, 2016b), whether caused by the pandemic or by other factors, is being disregarded.

However, as well as a squandered opportunity, there is another valuable lesson here regarding the 'ICAN' strategy which concerns the benefits of a socio-cognitive approach to the KS1 curriculum. The Language Training programme used to develop the skills of young children is very similar to the Dialogic Approach to learning proposed by Robin Alexander (Alexander, 2019). The essence of the Dialogic Approach is based on the development of oracy across various subjects at school so that teachers can help children with the articulation of ideas, problem-solving and the building of social skills and emotional regulation all through discussion (Alexander, 2019). There is a clear parallel here to the socio-cognitive theories of Vygotsky and Brunner who highlighted the importance of dialogue between teacher and learner in promoting development. Thus the Dialogic Approach, and by extension the DfE's Language Training programme, may both derive a large portion of their benefits from their engagement in the socio-cognitive aspects of learning.

Consequently, in the following section, this paper examines the potential obstacles to and benefits of taking a more general socio-cognitive approach in the KS1 curriculum. We will consider how a language-rich curriculum can encourage talking and discussion as the chief method of developing literacy skills.

An opportunity to consider children's development through the lens of Socio-cognitive theory

While the disruption caused by the pandemic has negatively impacted the learning of students, it has created the opportunity to re-assess regular practice and make much needed changes to how the National Curriculum is delivered. However, this raises the question whether we should be searching for inspiration regarding better practice within the UK or

further afield. The advent of globalisation has resulted in supranational organisations taking the helm to measure how countries fare in the neo-liberal, marketised global economy. In a bid to hold onto their uniqueness in an age of isomorphism (Probert, 2022), ironically, England has often looked to the education systems of other nations to ensure it can defend its reputation as offering the best education in the world (Shepard, 2010, in Probert, 2022). Indeed, England has a history of looking for foreign inspiration to improve its education system, stretching back to the 1960s, where a group of teachers visited Stalinist Russia to observe the ways in which the school curriculum could be improved for the sake of developing children for the workplace (Chitty, 2014). Though the Russian system of education was unattractive to the UK government at the time, improving the effectiveness of education by observing and borrowing strategies and policies from other countries was already an emerging discourse. Moreover, this would not be the only instance that England would look abroad to ensure they have the best education system in the world. To this end, England has sought to borrow policies from the east, specifically Singapore and Shanghai (DfE, 2016a) to boost its PISA scores, and yet it has not researched the context of the education policies in these countries to determine their suitability for the UK.

An important observation is made by Meyer and Schiller (2013), who posit that in international evaluation of education systems, social data regarding a child's background is ignored or treated like 'residual noise'. When a country does well in international assessments such as PISA, policy borrowers are not interested in the country's culture, history and institutions but in its curriculum, finances and governance. However, at this moment in time the government might well be advised to take greater notice of the 'residual noise' when adapting the curriculum, taking into account not just the impact of the pandemic but other demographic changes it has ignored for so long.

What this suggests is that future efforts to reform and enhance the education system need to take into account the social embeddedness of education (Granovetter, 1985). This can be done by using a socio-cognitive approach. The socio-cognitive approach focuses on the importance of communication and language as a means of understanding how to share ideas through the medium of dialogue (Perret-Clermont *et al.*, 2004). By interacting with others through conversation, a child actively refines their mode and delivery of speech to develop an understanding of what others are saying to them and how they then respond. The socio-

cognitive approach requires that a 'more knowledgeable other' provides the scaffold as a form of support, and that activities are completed in groups to enable problem solving to occur through dialogue (Rosnay and Hughes, 2010). More specifically, children learn through observing, to adapt or develop their thinking skills to interact with the situation at hand.

Taking such an approach would help us to understand the changes that are occurring socially (and those that have been ignored) among students at the KS1 level and how the KS1 curriculum could be amended to reflect this at local level as well as at national level. For example, as part of the post-pandemic recovery it would be worthwhile focussing on the social and language skills of young children to help them access changes in the curriculum and develop cognitive skills (Boaler, 2016). However, this can only happen if we improve children's social and emotional development by investigating how children live and what happens in their communities. Perhaps then, using strategies (from abroad if needed), we can empower schools to work in the children's best interests and not just in the economy's best interests (OECD, 2020a).

Using a socio-cognitive approach in this way, to understand the barriers to effective learning and motivation to learn (Bempechat and Drago-Severson, 1999) through an exploration of the changing cultural context would be a significant step forward in evaluating and rebalancing education outcomes for children from underprivileged backgrounds. The benefit of a socio-cognitive approach comes from a localised focus which helps to create a more elaborate picture of how children's learning and development is influenced by the wider community and how much of this is embedded in school-life. Significantly, it would be worth investigating how much influence the school has within local communities too. The centralised system of education in England may have its advantages in terms of ensuring equality of access; however, without understanding the local context, education is not provided equitably and this is where children in England have been disadvantaged (National Literacy Trust, 2021).

It is worth noting that an increased awareness of the local context and its requirements does not rule out the adoption of policies and practices from abroad where they meet those requirements. An example of this can be found in the progress resulting from the implementation of the *Improving Primary Mathematics Programme* (Whitburn, 2002; DfE, 2013). This programme focussed on the results from TIMSS assessments, or the Taiwanese

and Swiss methods which were the focal point before the implementation of the National Numeracy Strategy (Brown *et al.*, 1998), a strategy created from the best practice that defined not only what mathematical areas were to be taught but also how they should be taught. While there are critics of this programme who feel it has reduced the autonomy of teachers, the programme implemented Bruner's *Concrete, Pictorial and Abstract* method (Zuliana, Retnowati and Widjajanti, 2019) for developing understanding of many of the topics that children found difficult. This approach embraces the socio-cognitive principle that children need to participate in their learning actively, as opposed to being passive recipients. Another area where a socio-cognitive approach would help would be in assessing the changing lives of children as a result of the pandemic and the impact of increased digitisation (the use of digital devices) in children's everyday lives (Lindeman, Svenson and Enochsson, 2021). Due to the challenges of remote teaching and learning the use of digital devices and in particular digital applications have become widely used by almost all schools (Hirsh-Pasek *et al*., 2015). The use of online learning platforms that boost early literacy and numeracy have come to the fore during the pandemic to provide an interactive digital experience in terms of delivering engaging content that support learning both at home and at school. The challenges and opportunities this change has presented for KS1 is what we will consider next.

The impact of increased digitisation

Chronaki (2000) writes that the computer has become a symbol of the complex social changes in work and leisure. We would go further and argue that by this point these complex changes have filtered their way into education too, especially in the case of online learning. Increasingly, the use of online learning in education is promoted as a new platform of communicating and interacting for the purpose of getting things done more efficiently. This process is described by the term 'digitisation', which refers to this increase in the use of technology as an additional medium to communicate and access services (Mangen and Van Der Weel, 2016). In terms of education, advocates of online learning see it as a key resource to aid learning as well as helping to ensure 'continuity of teaching and learning' (Reimers *et al.*, 2020), a term which refers to ensuring students continue to receive education in challenging circumstances, such as when teachers and pupils are unable to engage in face-to face-learning. The potential of online learning to provide continuity in education was

demonstrated, in the eyes of many, during the lockdown and this has only served to further enhance its image as a critical educational tool (Evans, 2020).

While online learning can assist in delivering knowledge and prompting new learning, a teacher is required to direct the process, help to bridge gaps in understanding and, more importantly, to document when and what skills have been learned by highlighting which learning objectives have been achieved. In addition, the apps and websites that make online learning possible need first to be sourced before being offered to children. Altogether, this shifts the focus of the role of the teacher from being a deliverer of instruction to being a facilitator of learning (Salmon, 2011).

The digitisation of what Dewey called the 'micro-society' (Danforth, 2009) requires us to consider the implications of this explosion of online learning facilitated by the COVID-19 pandemic. Dewey's 'micro-society' refers to education establishments and the education provided within them as real-life experiences for children, and not merely a place where children practise being part of the 'adult society'. As such, children should be seen to be active participants in their school lives. Within this 'micro-society' the shift to online learning, facilitated by schools during the pandemic, places the onus on the child to 'meet the teacher half way' and engage more with the learning process. Children are no longer sitting and watching a teacher talk through an activity as they might in a more traditional offline classroom but, through the use of online learning technology, they can actively build understanding through activities that are interlaced throughout the session. Thus, online learning makes it possible for the child to become more involved as opposed to being a passive recipient restricted by the logistics of the classroom.

In addition to changing the roles of both teacher and learner, the digitisation of the classroom offers alternative models for delivering education. For example, when a class involves the use of learning applications (apps), the method of delivering content and the way a student responds can be dynamic, in that the program can respond instantly. For example, the Reading Eggs app (created by 3PLearning) embeds interactive activities within a text that the students are reading, allowing them to seamlessly test their own comprehension, grammar and spelling as part of the reading activity. The most striking aspect is that the one-to-one correspondence between the student and the app appears to increase the chances of the student taking on more of the responsibility for attaining and learning a new skill (Hirsh-Pasek,

et al., 2015). Through the use of digital 'rewards', such as a points or achievements, the app offers a reinforcement (Skinner, 1958) in return for a task being completed, which may encourage children to make further progress and move onto the next level of challenge. For example, TT Rockstars (created by Bruno Reddy) allows students to test their knowledge of multiplication individually where they can earn certificates of achievement, and collectively, where they can compete as a group against other classes or schools. When these challenges are completed independently at home (as part of an online learning activity) it appears to motivate further independent learning, with the children choosing voluntarily to seek further rewards through completion of the tasks. It is important to add here that this outcome also occurs among children that are considered low-attaining, suggesting that digital devices are having this impact, not only on their learning but attitudes to independent learning (Rashid and Asghar, 2016). There are two indications here which suggest that some of the benefits which come this form of learning are related to the idea of 'learnification' as proposed by Biesta (2009). Firstly, when learning through these apps, children appear to take responsibility for their own learning, and secondly, they are more likely to attempt a task that they need to complete independently. And yet, immersive as these challenges are, they contain very little in the way of verbal or written responses and thereby miss a range of early communication skills which foster a higher level of thinking and questioning, and can sometimes be viewed as remote from the work that is being done in the classroom.

While we have discussed some of the ways in which digitisation could result in improvements in the learning outcomes for young children, one thing we have not considered thus far is how and where children access this digital content. It is worth noting that many of these applications are introduced in school and are made available to children to use outside of school to enable them to practise and cement their learning. This raises one key issue; teachers expect all children to have access to digital devices and an access to the internet at home. The OECD is currently measuring the digital divide within nations to assess the level of investment needed to provide equal and reliable access to the internet and devices that enable this. The digital divide refers to 'the gap between individuals, households, businesses and geographical areas at different socio-economic levels with regards to both their opportunities to access information and communication technologies, and to their use of the internet for a wide variety of purposes' (OECD, 2002). In England, many children have been

unable to access the basic skills applications and online teacher directed learning due to their parents' socio-economic status and /or the strength of their internet connection due to their geographic location (Office for National Statistics, 2019). Focusing on socio-economic status, many children and their families experience digital exclusion due to the indicators mentioned above. This has an impact on the progress these children have been able to make during the pandemic, with opportunities to improve attainment being lost due to issues of affordability (Education Policy Institute, 2021). As digitisation adds another dimension to education in England, the attainment gap is further widened, resulting in children already living in challenging circumstances falling even further behind. This should be one of many considerations for the government when moving forward in this area, and they should not seek to expand the degree to which children learn digitally without addressing the problems children are currently facing.

For now, it would appear that, while apps and online learning are useful resources, they are not a panacea which can replace the classroom or remove all inequalities in education. They are also only as effective as the teacher that directs and instructs the learning behind the scenes. Therefore, if we wish to retain some of the benefits of online learning uncovered by the pandemic, the implication for teacher training or Continuous Professional Development (CPD) is that they need to be able to incorporate the use of applications and online learning into their traditional teaching methods. We also need to find the means and resources needed to bridge the digital divide so that all students can enjoy these benefits (Education Policy Institute, 2021). However, while learning outcomes are achieved through the use of such apps, the language that accompanies traditional in-class learning and the exchange of communication between teacher and peers would be reduced as a result. This would run counter to what the government has been trying to achieve with the ICAN catch-up programme. As a result, this may cause a conflict between the two priorities of closing the attainment gap (OECD, 2022b; EEF, 2022; National Literacy Trust, 2022), and closing the language gap (National Literacy Trust, 2022; DfE, 2020). However, it may appear more favourable to use apps to aid language learning in tandem with knowledge building apps when attempting to close the attainment gap (Hirsh-Pasek *et al*., 2015).

Conclusion

In this paper we have reviewed a number of issues that the Department for Education in England needs to consider when responding to the impact of the pandemic on children in Key Stage1. We have attempted to explain how the pandemic has highlighted pre-existing inequalities in language development, the lost opportunities for developing a socio-cognitive approach and the impact of digitisation on certain areas of children's learning and development. In addition, the data from the 2022 KS1 SATs and the Phonics Screening check highlights that children have been impacted by the changes that have occurred as a result of the pandemic. Based on this review, there are three recommendations we would make for future practice and research.

Firstly, we would suggest a move away from the individualistic culture and performative nature of education, looking instead to countries that enact a dialogic curriculum to enhance learning. Our second suggestion would be to explore the lived experiences of children within their communities to understand how similar or different the school environment is to the child's social experience. Thirdly, we would suggest that the DfE needed to research the impact of digitisation on young children and how it affects cognitive development.

The pandemic has provided a perfect opportunity to evaluate the habits of institutions involved in children's development and how children's development has evolved. This opportunity should be grasped to revisit how children learn and whether the English Education system for children aged five to seven addresses the challenges and opportunities children are faced with today.

References

Alexander, R. (2004) *Towards Dialogic Teaching: Rethinking Classroom Talk*. Cambridge: Dialogos UK.

Alexander, R. (2019) Developing Dialogic Teaching: genesis, process, trial. [Online]. *Research papers in Education*. Available at: <http://robinalexander.org.uk/wp-content/uploads/2019/12/RPIE-2018-Alexander-dialogic-teaching.pdf>[Accessed February 2023]

Bakopoulou. (2022).The impact of the COVID-19 pandemic on early years transition to school in the UK context. *Education 3-13*, pp. 1–14.

Bempechat, J., and Drago-Severson, E. (1999) Cross-national differences in academic achievement: Beyond etic conceptions of children's understandings. *Review of Educational Research, **69**(3),* pp. 287–314.

Biesta, G. (2009) Good education in an age of measurement: on the need to reconnect with the question of purpose in education. *Educational Assessment, Evaluation and Accountability,* **21**(1), 33–46.

Boaler, J. (2016) *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching*. San Francisco, CA: John Wiley and Sons.

Brown, M., Askew, M., Baker, D., Denvir, H. and Millett, A. (1998), Is the National Numeracy Strategy Research-based? *British Journal of Educational Studies,* **46**, pp. 362–385.

Browne, L. and Wong, K. R. (2016). Transnational comparisons of teacher expectation of mathematical functional ability in early years and Key Stage One pupils - a study undertaken in Hong Kong and England. *International Journal of Primary, Elementary and Early Years Education*, **45**(4), pp. 504–515.

Chitty, C. (2014) *Education Policy in Britain (3rd Edition)*. Basingstoke: Palgrave Macmillan.

Chronaki, A. (2000) Computers in Classrooms: Learners and teachers in new roles. In B. Moon, B. Brown and M. Ben-Perez (Eds.) *Routledge International Companion to Education*. Abingdon: Routledge.

Danforth, S. (2009) Dewey and Philosophy of Inclusion: In: M. Schuelka, C.J. Johnstone,G. Thomas and A.J. Artiles (Eds.) *The Sage Handbook of Inclusion and Diversity in Education.* London: Sage Publications.

Department for Education (2013) *National curriculum in England: Mathematics programmes of study*. London: Department for Education. [Online]. Available at: <https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study> [Accessed 13 June 2023].

Department for Education (2016a) *PISA 2015: National report for England*. London: Department for Education. [Online]. Available at:

<https://www.gov.uk/government/publications/pisa-2015-national-report-for-england> [Accessed 13 June 2023].

Department for Education (2016b) *The Rochford Review: Final report. Review of assessment for pupils working below the standard of national curriculum tests*. London: Department for Education [Online]. Available at: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/561411/Rochford_Review_Report_v5_PFDA.pdf> [Accessed 12 February 2023].

Department for Education (2018) *Multi-million investment to support children's early communication skills*. London: Department for Education. [Online]. Available at: <Multi-million investment to support children's early communication skills - GOV.UK (www.gov.uk)> [Accessed 12 February 2023]

Department for Education (2019). *Collection: National Curriculum Materials: Practice Assessments*. London: Department for Education. [Online]. Available at: <https://www.gov.uk/government/collections/national-curriculum-assessments-practice-materials>[Accessed 12 February 2023]

Department for Education (2020). *Key stage 1 SATs replacement to be rolled out at September*. [Department for Education. Online]. Available at: <https://www.gov.uk/government/news/key-stage-1-sats-replacement-to-be-rolled-out-at-september> [Accessed 12 February 2023].

Department for Education. (2021a) *Every school with a reception class offered language training.* London: Department for Education. [Online]. Available at: <https://www.gov.uk/government/news/every-school-with-reception-class-offered-early-language-training>[Accessed 12 February 2023]

Department for Education (2021b) *Teaching a broad and balanced curriculum for education recovery.* Department for Education. [Online]. Available at: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033448/Teaching_a_broad_and_balanced_curriculum_for_education_recovery.pdf>[Accessed 12 February 2023]

Department for Education (2022) *Key Stage One and Phonics Screening check attainment.* London: Department for Education. [Online]. Available at: <Key stage 1 and phonics screening check attainment, Academic Year 2021/22 – Explore education statistics – GOV.UK (explore-education-statistics.service.gov.uk)> [Accessed 12 February 2023]

Department for Education (2023) *Guidance: National Tutoring Programme for Schools, academic year 2023/24.* London: Department for Education. [Online]. Available at: <https://www.gov.uk/government/publications/national-tutoring-programme-guidance-for-schools-academic-year-202324> [Accessed 12 June 2023].

Education Endowment Foundation (2018) Annual Report. London: Education Endowment Foundation. [Online]. Available at: <https://educationendowmentfoundation.org.uk/news/eef-publishes-2018-annual-report> [Accessed 12 February, 2023]

Education Endowment Foundation (2022) Annual Report. London: Education Endowment Foundation. [Online]. Available at: <https://d2tic4wvo1iusb.cloudfront.net/documents/annual-reports/EEF-Annual-Report-2022.pdf> [Accessed 12 February, 2023].

Education Policy Institute (2021) *Covid-19 and disadvantage gaps in England 2021.* London: Educational Policy Institute. [Online]. Available at: <https://epi.org.uk/publications-and-research/covid-19-and-disadvantage-gaps-in-england-2021/>[Accessed 12 February, 2023].

Evans, C. (2020) The coronavirus crisis and the technology sector. [Online]. In: *National Association for Business Economics.* Available at: <https://link.springer.com/content/pdf/10.1057/s11369-020-00191-3.pdf> [Accessed 12 February 2023]

Exley, S., Braune, A. and Ball, S.J. (2011) Global Education Policy: networks and flows. *Critical Studies in education,* **52**(3). [Online]. Available at: <https://www.tandfonline.com/doi/abs/10.1080/17508487.2011.604079?casa_token=s-ExDKdZE30AAAAA%3AihEchZQHM1vQrsNcWWFHRI8TBVK0VE11mNR3Y0KRPBdyaHB6odhVIW0Tr0TVPTAbwmp2aFo6-h6bw8UandjournalCode=rcse20> [Accessed 14 March 2022].

Granovetter, M. (1985) Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology,* **91**(3), pp. 481–510.

Hall, R. and Pulsford, M. (2019) Neoliberalism and primary education: Impacts of neoliberal policy on the lived experiences of primary school communities. *Power and Education,* **11**(3), pp. 241–251.

Henare, A. (2003). Artefacts in Theory: Anthropology and Material Culture. *The Cambridge Journal of Anthropology,* **23**(2), pp. 54 – 66.

Hirsh-Pasek, K., Zosh, J. M., Michnick Golinkoff, R., Gray, J. H., Robb, M. B. and Kaufman, J. (2015) Putting Education in 'Educational' apps: Lessons at the science of learning. *Association for Psychological Science,* **16**(1). [Online]. Available at: <https://journals.sagepub.com/doi/10.1177/1529100615569721> [Accessed 12 February 2023].

Hutchings, M. (2015) *Exam Factories: The impact of accountability measures on young children*. The National Union of Teachers. [Online]. Available at <https://www.basw.co.uk/system/files/resources/basw_112157-4_0.pdf> [Accessed 13 May 2023]

Ihm, Zhang, H., van Vijfeijken, A. and Waugh, M. G. (2021). Impacts of the Covid-19 pandemic on the health of university students. *The International Journal of Health Planning and Management,* **36**(3), pp. 618–627.

Jeffrey, B. (2010) Performativity and Primary teacher relations. *Journal of Education Policy,* **17**(5), pp. 531–546.

Lindeman, S., Svensson, M. and Enochsson, A.B. Digitalisation in early childhood education: a domestication theoretical perspective on teachers' experiences. *Education and Information Technologies,* **26**, pp. 4879–4903.

Lucas, M., Neilson. J. and Sims, D. (2020) *School's responses to Covid-19: Pupil engagement in remote learning. National Foundation for Education Research.* [Online]. Available at: <https://files.eric.ed.gov/fulltext/ED608590.pdf> [Accessed 12 June 2023].

Mangen, A. and Van der Weel, A. (2016) The evolution of reading in the age of digitisation: an integrative framework for reading research. *The United Kingdom Literacy Association,* **50**(3), pp. 116–124.

Martin, S. (2009) *The hard truths about our school system that ministers won't admit: The uproar over whether or not SATs should be scrapped is just a distraction at the real problems in education, argues a top head. The Evening Standard*. [Online]. Available at: < https://www.proquest.com/docview/330364223/E560100A282848F8PQ/8?accountid=12115> [Accessed 14 January 2023].

Meyer, H-D. and Schiller, K. (2013) Gauging the Role of Non-educational Effects in Large-scale Assessments: socio-economics, culture and PISA outcomes. In H-D. Meyer and A. Benavot (Eds.) *PISA, Power, and Policy: the emergence of global educational governance.* Oxford: Symposium Books.

McNess, E., Triggs, P., Broadfoot, P., Osborn, M. and Pollard, A. (2007) The changing nature of assessment in English primary classrooms: Findings at the PACE project 1989-1997. *Education 3 – 13,* **29**(3), pp. 9–16.

National Foundation for Educational Research (2022*) Evaluation of Year 1 of the Tuition Partners Programme: Impact Evaluation for Primary Schools.* National Foundation for Educational Research. [Online]. Available at: <https://www.nfer.ac.uk/evaluation-of-year-1-of-the-national-tutoring-programme/> [Accessed 13 June 2023].

National Association of Schoolmasters Union of Women Teachers (2023) *Education Recovery Policy Statement*. London: *NASUWT* [Online]. Available at: <https://www.nasuwt.org.uk/advice/health-safety/coronavirus-guidance/covid-19-advice/covid-19-advice-england/education-recovery-package/education-recovery-position-statement.html> [Accessed 13 February 2023].

National Literacy Trust. (2021) *Children and young people's reading engagement in 2021.* London: National Literacy Trust [Online]. Available at: <https://literacytrust.org.uk/research-services/research-reports/children-and-young-peoples-reading-engagement-in-2021/> [Accessed 14 March 2022].

National Literacy Trust. (2022) *COVID-19 and Literacy: Discussion, analysis and recommendations.* London: National Literacy Trust [Online]. Available at: <https://literacytrust.org.uk/information/what-is-literacy/covid-19-and-literacy/covid-19-and-literacy-discussion-analysis-and-recommendations/> [Accessed 15 March 2022].

Nelson, J., Lynch, S. and Sharp, C. (2021). *Recovery During a Pandemic: the ongoing Impacts of Covid-19 on Schools Serving Deprived Communities*. Slough: NFER.

Office for National Statistics (2019) *Exploring the UK's digital divide: The scale of digital exclusion in the UK; those who aren't currently using the internet, how digital skills vary for different groups of the population and some of the barriers to digital inclusion. London:* Office for National Statistics. [Online]. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/articles/exploringtheuksdigitaldivide/2019-03-04#the-scale-of-digital-exclusion-in-the-uk> [Accessed 12 February 2023].

Organisation for Economic Co-operation and Development. (2002) *Understanding the digital divide*. Paris: Organisation for Economic Co-operation and Development. [Online]. Available at: <https://www.oecd.org/digital/ieconomy/1888451.pdf> [Accessed 15 March 2023].

Organisation for Economic Co-operation and Development (2018) *Education Working Papers: Skills for the 21st Century: Findings and policy lessons at the audit of adult skills*. Paris: Organisation for Economic Co-operation and Development. [Online]. Available at: < https://www.oecd-ilibrary.org/education/skills-for-the-21st-century_96e69229-en> [Accessed 15 March 2023].

Organisation for Economic Co-operation and Development (2020a) *Productivity, Human Capital and Educational Policies*. *Paris: Organisation for Economic Co-operation and Development.* [Online]. Available at: <https://www.oecd.org/economy/human-capital/> [Accessed 15 March 2023].

Organisation for Economic Co-operation and Development (2020b) *What does the research say? Curriculum Overload: A way forward*. *Paris: Organisation for Economic Co-Operation and Development.* [Online]. Available at: <https://www.oecd-ilibrary.org/sites/0ebc645c-

en/index.html?itemId=/content/component/0ebc645c-en#chapter-d1e302> [Accessed 15 March 2023].

Perret-Clermont, A., Pontecorvo, C., Resnick, L.B., Zittoun,T. and Burge, B. (2004) Joining Society: Social Interaction and Learning in Adolescence and Youth. Cambridge: Cambridge University Press.

Probert, S. (2022) Policy transfer and isomorphism: A case study of the England-China maths teacher exchange. *British Journal of Educational Studies,* **70**:3, pp. 305–321.

Purcell-Gates, V. McIntyre, E. and Freppon, P. A. (1995) Learning written storybook language in school: A comparison of low-SES children in skills-based and whole class language classrooms. *American Educational Research Journal,* **32**(3), pp. 659–685.

Quigley, A. (2020) Closing the reading gap.Abingdon: Routledge.

Rashid, T. and Asghar, H.A. (2016) Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, **63**, pp. 604–612.

Reimers, F., Schleicher, A., Saavedra, J. and Tuominen, S. (2020) *Supporting the Continuation of Teaching and Learning during the COVID-19 Pandemic-Annotated Resources for Online Learning*. Paris: Organisation for Economic Co-Operation and Development. Available at <https://www.oecd.org/education/Supporting-the-continuation-of-teaching-and-learning-during-the-COVID-19-pandemic.pdf> [Accessed 13 March 2022].

Rosnay, M. and Hughes, C. (2010) Conversation and Theory of Mind: Do children talk their way to socio cognitive understanding? *British Journal of Developmental Psychology,* **24**(1), pp. 7–37.

Salmon, G. (2011) E-Moderating: The Key to Online Teaching and Learning (3rd ed).Abingdon: Routledge.

Skinner, B. F. (1958) Reinforcement today. *American Psychologist,* **13**(3), pp. 94–99.

Sivrikova, N. V., Ptashko, T. G., Perebeynos, A. E., Chernikova, E. G., Gilyazeva, N. V. and Vasilyeva, V.S. (2020). Parental Reports on Digital device use in infancy and early childhood. *Education and Information Technologies,* **25**, pp. 3957–3973.

Vulchanova, M., Baggio, G., Cangelosi, A. and Smith, L. (2017). Language development in the digital age. *Frontiers in Human Neuroscience,* **11**. [Online]. Available at: <https://www.frontiersin.org/articles/10.3389/fnhum.2017.00447/full> [Accessed 12 February 2023].

Ward, H. (2017) 'Uneasy peace' breaks out over primary assessment. *The Times Educational Supplement* (28 April, 2017). Available at: <https://www.proquest.com/docview/1892342269/367E1D2078984B54PQ/1?accountid=12115> [Accessed 12 June 2023].

Whitburn, J. (2002) Mathematical Attainments in Primary Schooling: Raising standards and reducing diversity. *National Institute of Economic and Social Research,* **179**(1), pp. 64–75,

Whiteside, K. (2016) English language proficiency and Early School Attainment among children learning English as an additional language. *Child Development,* **88** (3), pp. 812–827.

Zuliana, E., Retnowati, E. and Widjajanti, D. (2019). How should elementary school students construct their knowledge in mathematics based on Bruner's theory? *Journal of Physics: Conference Series*, 1318. 012019. 10.1088/1742-6596/1318/1/012019.