

Written evidence submitted by Mrs C Roche

As a devoted mother of two primary school age children with a passion for all aspects of health and wellbeing, I have been horrified by the reckless implementation of digital technology at their school, as well as altogether negligent practices relating to screen time more generally, which signify a disregard for the safety of our children. After raising our concerns, the ignorant responses which ensued from those charged with the responsibility of protecting our children during school hours - and the realization of how widespread these attitudes and misconceptions are - engendered in-depth research into the damaging effects screen time has on myriad aspects of children's developmental, neurological, physiological and emotional health – and the potential disastrous implications this has on academic success (as well as being a predictor for success in other areas of life). The startling evidence from specialists worldwide and warnings against the usage of and reliance on screens in childhood makes the fact that we have no laws or guidelines relating to screen use in education settings all the more alarming. It seems that in this uncharted territory, naïve excitement has usurped objective analysis of screen usage and safeguarding has gone out of the window completely. Whether this is convenience induced denial due to pressure from tech companies, school's egos, adults unaddressed screen addiction or is of a political nature is irrelevant. According to the United Nations Convention on the Rights of the Child, schools and authorities have a duty to act in the child's best interests at all times, protect the health, development and wellbeing of children, and develop the child's mental and physical abilities to their fullest potential¹. With the digitalization of classrooms seemingly ignoring the overwhelming research against screens and lacking appropriate guidelines it begs the question: Are those responsible falling short of upholding those rights, while simultaneously witnessing an obvious dramatic explosion of diagnoses of various related side effects and life-altering disorders among children by failing to meet this most basic obligation?

The points I will bring to your attention are as follows:

- Ocular effects
- The brain and addiction to screens
- Myelin abnormalities
- Electronic Screen Syndrome
- ADHD
- TV use and associated risks
- Internet use, social media & mental health
- EMFs
- Screen limits
- Effects on education
- Sweden's approach

Ocular effects

Prolonged screen use in educational settings creates problems in children's developing visual systems.²³This has resulted in an explosion of children needing 'correction lenses' and a myopia epidemic,⁴ with children developing near-sightedness at earlier ages than in the past.⁵ While myopia can be linked to genetic factors, it can also be environmentally induced via screens⁶ and estimates suggest that 50-90% of regular computer users experience a deterioration in their vision.⁷ As Dr. Jeffrey Anshel puts it, "We are increasingly becoming an information society, and the price

we are paying is our eyesight.”⁸ Putting strain on a child's eyes and developing visual system puts a strain on their brains. It can make learning to read more of a challenge and developmental optometrists indicate that putting the visual system under stress can compromise the entire nervous system, leading to poorer focus and worse educational outcomes.⁹ The blue light emitted from such devices not only affects melatonin levels and sleep,¹⁰ but early studies correlate blue light with precocious puberty and fertility issues.¹¹ This is especially concerning for children who may be required to complete homework on a screen device.

The brain and addiction to screens

Dr. Kardaras, an Ivy League educated psychologist and expert on mental health, addiction, and the impacts of our digital age states that schools, mental health and medical communities are “Grossly misinformed about the research that indicates the adverse effects of screens on kids.”¹² With much of what information is available produced by companies and organizations either profiting from or receiving financial incentives from sales of devices and “educational” software and apps,¹³ there’s a dearth of unbiased information, and so understanding the basics of the brain and addiction is imperative. The use of interactive screens releases dopamine, which causes usage to become a biologically addictive habit¹⁴ in exactly the same way that drugs can.¹⁵ While dopamine release was once a survival mechanism, the use of dopaminergic screens obviously do not serve this purpose any more, and so in the absence of a physical release (“fight or flight” situation), dopamine-overloaded receptor cells cause the cessation or reduction of dopamine production, making the user feel the urge to continue/increase usage. Overexposure damages the frontal cortex, which is associated with memory, judgement, attention and impulse control. With impulse control jeopardized, the addictive force is amplified – even more so for those with reduced baseline levels of dopamine, endorphins and norepinephrine, meaning they’re naturally more predisposed to addiction.^{16,17} Dr. Peter Whybrow, endocrinologist, psychiatrist and director of UCLA’s Institute for Neuroscience and Human Behavior refers to interactive screens as “electronic cocaine.”¹⁸ Neurologist-coined terms such as this (along with “digital heroin”¹⁹ and “digital pharmakeia”²⁰) are not without base. The hooking effect of ubiquitous hyper arousing screens such as iPads - so potentially potent in their analgesic effects that VR screen games are used in pain management^{21,22} – is heightened in children owing to the fact that the frontal cortex is not developed until around 25 years of age.²³ Proven by peer-reviewed brain-imaging scans showing the shocking similarities between the visible damage in the brains of children following interactive screen use (namely video games) and those of adult junkies. Yet interactive screens are permitted for unrestricted use in education settings for children, whose sensitive brains are in their most formative stages and neurobiologically speaking nowhere near equipped for the sensory bombardment screens entail.²⁴ As Kardaras puts it, “We’ve essentially been giving our most vulnerable an addicting, mind-altering electronic drug.”

Myelin abnormalities

Another neurological process that must be considered is myelination. Myelin, the brain’s white matter, acts as an insulation to the axons, making connections possible and enabling a better functioning neural network. Myelin speeds up connections and is what makes our brains able to work fast.²⁵ A vital developmental process, myelination increases in the areas of the brain that need it as we grow and learn.²⁶ While many people are aware of the negative effects of under stimulating a child’s brain (whereby connections atrophy) overstimulation from drug addiction and overexposure to interactive screens, can be just as damaging – all the more so during key developmental windows to the detriment of our attentional abilities, ability to feel empathy and discern reality.²⁷ George Bartzokis’ research correlates myelin abnormalities with ADHD and autism, schizophrenia, drug addiction and Alzheimer’s.²⁸ (Note that scientists are currently exploring the

credible link between Internet use and increased rates of dementia).²⁹ Dr. Hao Lei of the Academy of Chinese Sciences demonstrates through his research that people with Internet Addiction Disorder had myelin abnormalities in the parts of the brain responsible for executive attention, decision making and emotional generation, and that behavioral impairments and impulse control disorders – just as with drug addiction – is linked to IAD.³⁰ While the aforementioned research indicates that interactive screen games are linked to brain abnormalities, we must bear in mind that iPads are also interactive and unnaturally stimulating and bear similar hyper-arousing traits since it is often game designers that once created hypnotic games using tactics like “war of the eyeballs” that are now employed to develop these so-called “educational” apps, with designers focusing primarily on holding kids’ attention. Huge tech conglomerates manipulate parents and educators into believing that iPads and associated apps are educational and free from adverse side-effects.

Electronic Screen Syndrome

Board Certified integrative child psychiatrist Dr Victoria Dunckley hypothesized that the explosion in numbers of children diagnosed (and often medicated for) various developmental, behavioral and psychiatric disorders could be being caused or amplified by one common factor – screens. Her ensuing extensive clinical research supports this hypothesis that the overstimulating nature of electronic screens causes what she calls Electronic Screen Syndrome – where “fight or flight” mode causes poor frontal lobe functioning, desynchronization of our clock, altered brain chemistry and disrupted hormones - and that *regardless of its content* electronic screens disrupt the vulnerable and finely tuned developing nervous systems and mental health of children³¹. Most importantly, while undeniably heightened for kids with various disorders, all kids were being negatively affected in some way. This could mean more subtle symptoms relating to dysregulated mood, impaired cognition and dysfunctional behavior and could present as: irritability, apathy, moodiness, depression, tiredness (due to lack of restorative sleep), poor focus, forgetfulness, disorganization, defiance, impulsiveness and low empathy, to name a few. She proves that ESS can either mimic, create or exacerbate certain disorders such as ADHD, depression, anxiety, bi-polar, learning disorders, PTSD, panic attacks, OCD, tics, sensory processing disorder and autism (exacerbated only). Dunckley suggests that autistic children may not be able to tolerate screens at all. In the tech fasts she prescribes, where this environmental toxin was eliminated completely, dramatic results showed a reduction in symptoms by at least 50% 80% of the time for those with a diagnosed disorder and a “complete resolution of symptoms” for those who only presented symptoms similar to but were actually free from such disorders. The consequence of excessive interactive screen time contributes to unnecessary medication use (sometimes irreversible), inefficient treatment and the misuse of health/educational resources. Eliminating screens can clarify diagnosis and minimize need for medication.³²³³

ADHD

The link between ADHD and interactive screens is clear. As Kardaras explains, they create a dependence on screens by conditioning kids to “Continually require stimulating screens to stay engaged”. The brain imaging scans showing damage to the frontal cortex,³⁴ as well as “tech fasts” efficacy, support this link.³⁵ Any reasonably observant person - whether parents, educators or medical and mental health professionals - has witnessed a dramatic increase in various disorders, including ADHD, in recent years, yet misinformation, substandard warped research and bias means those with vested interests in big tech are able to perversely manipulate the information and advice available. The fact that doctors are prescribing certain iPad apps for infants with ADHD (with literally the only research employed to substantiate this claim being that one app is better for than another app!)³⁶ shows just how uninformed some medics really are. While screens do not contribute to the healthy development of any child’s brain, the negative effects are magnified for those with certain

conditions and disorders, and yet heartbreakingly, extended screen use for children with various disorders, (often seen as “hard to manage”) is common practice. A popular misconception is that a child’s ability to focus on a screen means they do not have attention issues. NYU pediatrics professor Dr. Perri Klass counters this: “A child’s ability to stay focused on a screen, though not anywhere else, is actually characteristic of ADHD.”³⁷ Dr. Christopher Lucas, associate professor of child psychiatry at NYU School of Medicine reinforces this: “It’s not sustained attention in the absence of rewards; it’s sustained attention with frequent rewards.”³⁸³⁹ Manipulative “educational” apps such as TT Rockstars exemplify this well, with a strong addictive hook that feeds into a vicious ADHD cycle. As Nicholas Kardaras explains, “Brain-imaging shows that the frontal cortex (which controls impulsivity – a big ADHD component) gets compromised by screen exposure stimulation.”⁴⁰ With our attention being the door to the brain, affecting children’s ability to focus and think actively - by being able to move information from the working memory to the long-term memory - has devastating effects on their ability to learn. This is made only worse by delivering education digitally.

TV use and associated risks

Research demonstrates that the more time children spend on screens, the more they will watch later on and the more addicted they become. This is also true of TV. Although less damaging due to being passive viewing, it dampens imaginations and constitutes screen time nonetheless, and its overstimulating nature compromises children’s ability to focus. Scarily, just twenty minutes of cartoon viewing has been shown to negatively impact executive function skills, including attention, self-regulation and problem solving in preschoolers.⁴¹ From our experience TV and tablets are used way too freely, with unfettered access during “wet play”. Although viewing/usage is not compulsory, when kids are faced with the decision to choose between something which may require focus and creativity, or to zone out like zombies with the impatience-inducing, instant gratification of the images and sounds on the screens in front of them, which do you think they will choose? It is our responsibility as adults to nourish children’s minds and ease the burden of overstimulation, and provide engaging and enriching activities and opportunities to better develop their young minds at such a sensitive and formative stage in their lives. The reliance on screens as an academic tool in lessons seems to be commonplace and supports education experts worries about the “slackness” this engenders in the classroom, with teachers frequently Googling or showing videos to explain or highlight a point - killing imagination and exemplifying an apparent lack of overall preparation. Condensed digital images are shown to induce impatience with nature and this disconnect can cause “nature deficit disorder”⁴² at a time when children could benefit from appreciating the wonderment of nature more than ever before. TV is linked to sleep disturbance in preschoolers⁴³ and school-aged children.⁴⁴ With child obesity rates in the UK being worryingly high⁴⁵ and research showing that from early childhood screen time is an important risk factor⁴⁶⁴⁷⁴⁸⁴⁹ is this sedentary habit something schools should be encouraging?

Internet use, social media & mental health

A growing body of evidence links the rise in childhood depression to social media and internet use.⁵⁰ Facebook usage is shown to lead to social networking addiction (and IAD) leading to depressive symptoms. The use of social media is worrying with sites now targeting children, particularly girls, who are shown to be less happy than non-users.⁵¹ Social media is rightfully banned in schools, but an app of concern is Chatterpix. Available to children as young as 5 and worryingly similar to Instagram, users take selfies and decorate the photo with accessories and borders. Apps like this magnify insecurities and its adult version Instagram causes untold suffering for today’s youth.⁵² As well as promoting poor self-image (linked to eating disorders) and increased tech

addiction, Instagram is also responsible for leading those suffering from mental health issues further down a rabbit hole towards self-harm and suicide via the powerful algorithmically generated material it pushes. I'm saddened that a selfie app has been passed as appropriate for school children and is made available on their devices and makes me wonder just what else is slipping through and being labelled as "educational".

Time on screens also means less time engaging in health promoting activities which are essential for optimum growth and development in children.⁵³ The availability of screens robs children of the absolute luxury that is boredom, from which creativity inevitably blooms⁵⁴⁵⁵⁵⁶ and is beneficial for developing children's powers of observation, patience and imagination – Nicholas Kardaras describes these skills as, "The most developmentally and neurosynaptically important skill that they can learn." We are now facing a "creativity crisis"⁵⁷ in our modern sensory bombarded society, "despite a global survey of 1,500 CEOs" naming "creativity as the number one attribute for leadership."⁵⁸⁵⁹ With digital screen imagery proven not just to dampen imaginations, but reduce acuity⁶⁰ and lowering sensory awareness,⁶¹⁶² (dulling effect) - which in turn is proven to negatively affect a person's ability to learn and is linked to poorer academic performance - is it any wonder why top institutions are turning away from digital learning?

EMFs

Another potentially devastating effect of children's screen use that's causing doctors to become increasingly concerned is EMF radiation from wireless devices.⁶³⁶⁴ Not only do they wreak havoc on developing nervous systems, EMFs from mobile phones are now classed as "possibly carcinogenic" by the IARC⁶⁵ (the same category as DDT and lead), linked to infertility, can break down DNA, affect biological functions and hormone levels and modify biochemical processes inside the cell,⁶⁶⁶⁷ to name just a few effects. Just as the tobacco industry once claimed that smoking was not bad for our health (conversely, it was promoted by doctors as being beneficial!),⁶⁸ and it was only after years of pressure and large-scale peer-reviewed studies that the WHO finally conceded that mobile phones can possibly cause brain cancer. Consequently, the European Environmental Agency addressed the urgent need for more studies,⁶⁹ suggesting that mobile phones could be as big of a public health risk as smoking. Bear in mind that iPads generate powerful EMF as well, and that children's brain cells divide faster and their skulls are thinner (meaning radiation will penetrate more deeply). Conclusive evidence is lacking because environmental factors have especially long latency periods (up to 40 years for certain types of brain cancer) and extreme caution must be exercised even in the absence of conclusive research, particularly where children are concerned. As Sussman and Loewenstein state, "The heart of the controversy depends on whether you consider these emissions to be safe until proven hazardous or hazardous until proven safe."⁷⁰ Dr. Martha Herbert, Assistant Professor of Neurology at Harvard Medical School, Pediatric Neurologist at the Massachusetts General Hospital in Boston, and affiliate of the Harvard-MIT-MGH Martinos Center for Biomedical Imaging and director of the TRANSCEND Research Program (Treatment Research and Neuroscience Evaluation of Neurodevelopmental Disorders) correlates EMF exposure with autism⁷¹.

Screen limits

So, what do the experts say about screen time and recommended daily exposure limits? Pediatrics professors and the American Academy of Pediatrics expressed concern about the amount of screen time school-aged children are exposed to, stating that total combined screen time (inclusive of non-educational purposes) should not exceed one to two hours daily⁷² and should make the introduction of school screen time limits a priority. Many physicians express their concern about this not being cautious enough⁷³ and call for "media history" to form part of patients' medical

records⁷⁴ given their incontestable link to various disorders. With school-age children getting two or more hours of screen time per day being more likely to have psychological, developmental and emotional problems it's no wonder Pierre Laurent, former Microsoft executive suggests that limiting screen time for kids simply doesn't go far enough: "You could offer an hour's screen time a day, but media products are designed to keep people's attention...it has a hooking effect. It looks like it's soothing your child and keeping them busy, but the effect is not very good for small children".⁷⁵

Effects on education

After all this doom and gloom must come the educational benefits of digital learning, including the abundance of objective analyses and research demonstrating what wonderful learning tools iPads and the like are and how much they enhance the education of today's youth, sending them forth into their bright futures with a preparedness and aptitude for our high tech world that traditional learning methods of yesteryear could not come close to, right? Afraid not. Tablets don't actually afford kids much technological skill or advantage at all, as Alan Eagle, a Google executive affirms, "At Google and all these places, we make technology as brain dead easy to use as possible. There's no reason why kids can't figure it out when they get older."⁷⁶ There is a startling lack of research indicating any advantage aside from the tenuous link to spatial awareness, pattern recognition and some word retention - touted by (and/or funded by) ed tech corporations or those with vested interests.⁷⁷ Many education researchers cast serious doubt on the validity of such research. Education psychologist Dr. Jane Healy spent much of her life researching computers in schools and was shocked to discover a dearth of research proving benefits: "The research is set up in a way to find benefits that aren't really there. Most knowledgeable people agree that most of the research isn't valid ... Essentially, it's just worthless."⁷⁸ Other research demonstrates either no substantial benefit over digital versus analog learning, and a growing body of more recent research is able to prove that screen learning is neither appropriate nor effective for the classroom, that screen media are a poor tool for learning vocabulary and language,⁷⁹ linked to delayed language acquisition, and produces overall lower levels of improvement. Andreas Schleicher, educational analyst for the Organization for Economic Co-operation and Development (OECD) - which manages the PISA test - visited classrooms in countries the world over, and concluded that the most successful systems "Place their efforts primarily on pedagogical practice rather than digital gadgets".⁸⁰ Research also clearly shows that students retain more information when reading on paper and retention rates are far superior when information was written by hand. It makes sense that Silicon Valley bosses and tech geniuses, whose understanding of screen technologies (and the inherent dangers) far exceeds most - like Bill Gates, Steve Jobs, Jeff Bezos, Wikipedia founder Jimmy Wales, Google founders Larry Page and Sergei Brin - attribute their success to no/low tech formative years and education, also opting to keep their own children away from technology in Montessori and Waldorf schools.⁸¹

Sweden's approach

Following Sweden's proposed and implemented Digitalization Strategy and the most recently proposed Digitalization Strategy (2023-2027), access to screen-based learning was rolled out with the hopes of increasing digital competence and potentially positively impacting quality of instruction, equality and goal achievement. A research review "Digital and analog tools for learning, where do we stand?" was commissioned by the Swedish Ministry of Education, authored by cognitive neuroscientist Dr. Sissela Nutley with insights from the initiative Det syns inte and conducted by the non-profit organization Arts & Hearts. Since this report, Sweden made the bold

and wise move to scrap digital learning and have invested millions returning to more traditional methods⁸²⁸³.

The report states that, “There are no advantages for the child in starting to use digital screens early. On the contrary, research shows that it increases the risk of several problems for the child’s development and health”. The research showed that in the early years, screens inhibited creativity,⁸⁴ language development,⁸⁵⁸⁶ cognitive⁸⁷ and motor development,⁸⁸ and that the “digital bubble” inhibits spontaneous speech⁸⁹ and therefore emotional self-regulation and reasoning skills.⁹⁰ Also, learning goals were rarely met with the use of screens⁹¹ due to “transfer deficit”^{9293 9495} and that there was an increase in health risks due to the sedentary nature of screens.⁹⁶ Emphasis was placed on the research indicating that screen use was more common for children with various behavioral issues since this gives the outward illusion of calming the child, but that this is extremely concerning for children displaying symptoms of hyperactivity, low impulse control and attention problems since these children have a particular “vulnerability to develop problematic use of digital media, which in the long run can exacerbate existing issues”⁹⁷ as well as being undeniably addictive^{9899 100} during key developmental windows,^{101 102103} which can increase the risk of attention problems and impulsivity.¹⁰⁴¹⁰⁵¹⁰⁶

The research proving that digital learning tools are an obstacle to learning which distract from acquiring and developing knowledge in primary and secondary education is immense. Digital tools were shown to lead to more passive attitudes towards knowledge (the so-called “Google effect”)¹⁰⁷ more isolated work and poorer learning outcomes, and that the aforementioned “transfer deficit” persisted in these age groups, too. Students read slower and have lower comprehension when reading off a screen compared to on paper,¹⁰⁸ and memory¹⁰⁹¹¹⁰ and comprehension skills are far inferior when using digital devices. Taking notes digitally was also proven to produce worse results, with speed accounting for the drawback. Increased gaps had emerged in society as a result of the one device per student ratio because of the barrier to collaboration with parents this creates, with socio-economically disadvantaged families being hardest hit.¹¹¹

The report warns of the cognitively challenging environment education screen devices create, which places a high demand on the executive functions of the brain. Especially worrisome since this area isn’t fully developed until 25 years of age. Working memory capacity is shown to be impaired¹¹²¹¹³ and that children with neuropsychiatric disabilities being worse off as searching for information digitally creates a particular challenge.¹¹⁴ Inferior results are observed when students use “inquiry based learning” compared to when teachers convey facts directly¹¹⁵ and that advantages of searching for information online have not emerged over time¹¹⁶¹¹⁷ Distractions of digital learning was focused on in Dr. Nutley’s report, which states that inferior outcomes are observed in research comparing students with and without access to digital devices¹¹⁸¹¹⁹ with distractions from other devices in the room also being a significant issue.¹²⁰¹²¹

Dr. Nutley notes that digital media and screen devices and the extra adjustments and support they offer benefit those with special needs (such as dyslexia, learning difficulties, etc.),¹²² but that what’s necessary for the minority should not be used for all given the overwhelmingly negative impact digital learning has on children, adding that “It is the school’s responsibility to create a learning environment with the right conditions for children’s brains that enables and promotes their learning.”

Our Experience

It's too easy for those responsible to claim that screens are not a replacement for traditional teaching or used as digital babysitters during school hours, and that they're used purely to "enhance" learning. Bearing in mind the potentially devastating ramifications of screen time in education, I would like to share a few examples of how from our experience the unregulated digitalization of the classroom (and screen time in general) is open to reckless implementation and in need of urgent review, restrictions and regulations.

At the school my children attend, interactive screens are used as a tool for the majority of lessons with an iPad ratio of 1:1 from age 5 and up. Many lessons are conducted entirely on iPads; class reading activities are done on iPads instead of books; reading comprehension passages are read on iPads and answers often input on iPads; math exercises are copied down from iPads and games like TT Rock Stars are used to teach times tables. Initiated by my children, others have asked if they too can write their times tables out on paper instead, but were told that they should stick to TT Rock Stars so that they can "get up the leaderboard". There are many worrying attributes to this game which can affect behavior to such an extent that some parents are able to tell immediately upon collecting their child from school whether they've been on TT Rock Stars for extended time that day. After one year of pretty much daily use, TT Rock Stars proved ineffective in teaching my child his times tables, with massive gaps in his knowledge. By employing traditional methods to teach times tables here and there over the summer, he has started the new school year near the top of his class and I can certainly appreciate how digital learning widens the socio-economic gap. That said, it's difficult to assist my children with work they say they've been struggling with in class since most work seems to be completed or uploaded online.

Digital learning brings many immediately noticeable distractions for my kids during class time, one being other children who often surf the internet for non-educational purposes without the teacher's knowledge (football results, Lego and whatever else they would like to buy are the first searches that spring to my children's mind), or playing screen games when the teacher is not looking. Siri is an approved method to search for knowledge or spellings, as well using the iPad microphone as a dictionary, thus creating an attention-shattering cacophony of questions and digital responses. When finishing a piece of work ahead of the class, students are often directed back to TT Rock Stars or Key Note to fill in this time – of course some students take this as an opportunity to play games, etc. When teachers need to nip out or direct their attention elsewhere during class time, my children report occasions when they've been instructed to "just go on their iPads for a bit" until the teacher is ready.

When adverse weather means children are kept inside at lunchtime, films or TV shows are played and unfettered access to iPads is also permitted during this time. When my daughter was in Year 1, I lost track of the amount of entertainment TV they watched during class time, with Peppa Pig and Spidey being big favorites at the end of the day. Until I repeatedly complained to the school, loud, beat-heavy music (sometimes with inappropriate/sexual lyrics) was played over a sound system connected to a teacher's phone in the playground at lunchtime. Older students had access to the phone and were allowed to select the songs. Loud music was also played in the canteen during lunchtime with corresponding music videos shown on a big screen. Again, older students were permitted to change the song as they pleased. As well as leading to sensory overload, the inappropriate song choices exemplify how screen use and digital media can contribute to the sexualization of children, with songs like 'Barbie Girl', (lyrics include, "You can touch, you can play if you say I'm only yours", "Kiss me here touch me there hanky-panky") deemed appropriate and played frequently at lunchtime until the school finally took heed.

Given the overwhelming evidence against screen use in childhood and in education, it seems obvious that the use of screens in schools needs to be reevaluated urgently. Screen time should be restricted predominantly to IT lessons and there needs to be more transparency for parents to be able to monitor their child's exposure during school hours.

While schools do show awareness of the exploding mental and developmental health crisis we are witnessing unfold, there is a profound lack of knowledge about how screens are proven to be instrumental in either creating or exacerbating these problems. Screen-based learning appears to have been rolled out with no regard for the hazards and health risks screens pose to children. The findings overwhelmingly demonstrate that interactive screens are not just an ineffective education intervention, but a damaging one too. Moreover, the less technology and screen-based learning we employ in childhood, the healthier our children's minds and bodies will be, thus creating more potential for academic and lifelong success. As the Alliance for Childhood state: "A high-tech agenda for children seems likely to erode our most precious long-term intellectual reserves – our children's minds."¹²³ While Steve Jobs initially believed that technology could be the solution to education system's problems, he later admitted: "I've come to the conclusion that the problem is not one that technology can hope to solve. What's wrong with education cannot be fixed with technology. No amount will even make a dent."¹²⁴

¹ https://www.savethechildren.org.uk/content/dam/gb/reports/humanitarian/uncrc_child-friendly_2022.pdf

² Dr. Jane M. Healy, Failure to Connect: How Computers Affect Our Children's Minds – for Better and Worse, pp113

³ Alliance for Childhood, Fool's Gold: A Critical Look at Computers in Childhood chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.justinecassell.com/CC_Winter05/pdfs/allianceForChildhood_fools.pdf

⁴ <https://www.theguardian.com/society/2021/nov/14/eyeballs-screens-vision-nearsightedness-myopia>

⁵ Alliance for Childhood, Fool's Gold: A Critical Look at Computers in Childhood chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.justinecassell.com/CC_Winter05/pdfs/allianceForChildhood_fools.pdf

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⁸ Anshel, Jeffrey. Visual ergonomics in the workplace May/June, 1994, pp.20-22

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¹⁰ <https://www.blockbluelight.co.uk/blogs/news/blue-light-and-kids-development>

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- ¹⁸ Mary A. Fischer. *Manic Nation: Dr. Peter Whybrow Says we're Addicted to Stress*, *Pacific Standard* June 14. 2017
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- ²³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3621648/#:~:text=The%20development%20and%20maturation%20of%20the%20prefrontal%20cortex%20occurs%20primarily,helps%20accomplish%20executive%20brain%20functions.>
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