

# The Screen Paradox: Cognitive Costs in the Digital Age

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## Introduction

In this current time, when we are becoming more and more dependent on technology, it is inevitable that we will all use the Internet, Google and Artificial Intelligence. Living in the era of technology, our daily routines are closely intertwined with devices like smartphones, computers, TVs and much more. This constant exposure to screens and digital interactions has led to the emergence of a concept called 'Digital Dementia.'

'Digital Dementia' was first used by a German psychiatrist, Manfred Spitzer, to explain the detrimental effects on cognition of young people from excessive use of digital technology and video games [1]. In this article we explore the concept of Digital Dementia, how it can affect our newer generations, and how we can mitigate the potential harm.

## Definition

Overstimulation by digital tools, especially during the years of brain development, increases the risk of neurodegeneration. This results in impaired concentration [2,3], amnesia [4-6], decline in academic performance [7-9], decline in IQ levels [10], decreased reasoning and decreased creativity [11]. 'Digital Dementia' refers to this hypothesis that overuse of technology can lead to neurological and dementia related diseases in adulthood.

## Pathophysiology of Digital Dementia

The long-term effects of the overuse of computers and smartphones can worsen the neurochemistry of the brain and lead to changes in cortical grey and white matter volume [12]. Due to this downturn of cognition, there is an estimated 4-to-6-fold increase in the rate of Alzheimer's disease and related dementia post 2060 [10]. The online world influences

its users' attention, cognition and the neural processes that subsequently alter their cognitive-behavioral brain reserve [10]. Excess screen time is associated with volume and sulcal-depth reduction in the occipital cortex, leads to thinning of the temporal and prefrontal cortices, reduces limbic structures and weakens cortico-subcortical circuits [13]. Digital tools hamper working memory and intelligence, adversely affect inhibition and information processing, and reduces attention span [14].

## Understanding the Impact of Screen

This new age internet technology has created an exciting facade to mesmerize young individuals while enticing them to rely on such tools for data storage and retrieval. The primal act of Internet users when faced with challenging questions is to rely on external memory sources, like Google, to find answers. They have lower rates of recall of the information but enhanced rates of recall of how to retrieve it [5].

## Measures to Stop Digital Dementia

Some studies suggest replacing digital learning completely with traditional learning [10]. Others suggest a digital detox to productively use such internet inventions less frequently, so users don't deteriorate their cognitive and behavioral abilities [15]. By raising awareness, implementing preventive measures, and fostering digital mindfulness, we can mitigate its impact and ensure a brighter future for generations to come.

## Conclusion- Both Positive and Negative Use of Technology and How Can We Use It for Our Betterment

Portugal *et al.*, in their 2023 study hypothesized that an accessible internet environment and digital devices like

TVs, tablets and smartphones in children negatively affects their behavior control and can also compromise their neural development [16]. Small *et al.* suggests that certain computer software and video games may improve memory, multitasking skills, mood, social skills and fluid intelligence, however, early digital stimulation can also reduce executive functioning [17]. In conclusion, digital dementia poses significant challenges to cognitive health in the digital age. However, in this growing age, complete abstinence from digital technology is not possible. A balance must be created between time off-screen and on-screen. Digital breaks between use of devices can be the first step to mitigate the risk the users are planting for their adulthood.

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