The Academic
International Journal of Multidisciplinary Research

An Online Peer Reviewed / Refereed Journal
Volume 4 | Issue 10 | October 2026
ISSN: 2583-973X (Online), SJIF IF(2026): 5.6
Website: www.theacademic.in

The Rise of technology and its Psychological Effects on Human Cognitive Abilities

Pramitha Santhumayor, Sunndus Abdul Aziz

Asst. Professor, Royal College of Arts, Science and Commerce

Student, Royal College of Arts, Science and Commerce

DOI : https://doi.org/10.5281/zenodo.24491450

ARTICLE DETAILS

Research Paper

Received: 01-11-2026

Accepted: 07-11-2026

Published: 20-11-2026

Keywords:

Digital Technology, Cognitive Abilities, Psychological Effects, Attention, Memory, Critical Thinking

ABSTRACT

This paper aims to synthesize previously published studies and develop a comprehensive framework that delineates the psychological consequences of technological advancement on human cognitive abilities, e.g., attention, memory and critical thinking. The far-reaching integration of digital technology into individuals' daily lives has piqued curiosity regarding its impact on cognitive mental processes. While the emerging data suggest that its influence may be positive or negative, the depth of evidence regarding long-term cognitive effects remains limited. Through a comprehensive approach, this paper intends to offer a contemporary perspective on the psychological effects on human cognitive abilities.

Introduction

Advanced technologies are embedded in individuals' daily lives to the point of being utterly relied upon; Their universal adoption has altered the ways individuals communicate, think and process information. This growing dependence on digital technology has consequently raised concerns regarding its potential psychological and cognitive effects.

Although it lacks substantial scientific evidence as a recognized medical condition, the non-medical term “digital dementia” was coined by German neuroscientist Manfred Spitzer in 2012. The term refers to concerns surrounding potential declines in cognitive functions, particularly memory and attention, associated with excessive reliance on digital devices such as smartphones and computers. These concerns

Disclaimer: The opinions, interpretations, conclusions, recommendations, analyses, and statements expressed in this research article are solely those of the author(s) and do not reflect the views, policies, or positions of the Publisher, Chief Editor, Editors, Editorial Board, Reviewers, or their affiliated institutions. The author(s) are solely responsible for ensuring the originality, authenticity, and integrity of the manuscript and for ensuring that it is free from plagiarism, AI-generated content, copyright infringement, data falsification, and any other form of academic misconduct.

have further contributed to growing interest in whether prolonged digital technology use may influence attention, memory, decision-making and other cognitive abilities.

Literature Review

Research studies have indicated that excessive reliance on digital technologies has been linked to structural and functional impairments in the orbitofrontal, dorsolateral prefrontal and cingulate cortices, which are brain regions crucial for managing and controlling other cognitive functions. Existing literature suggests that technology can influence cognitive processes in both beneficial and potentially detrimental ways, depending on factors such as the type of technology, patterns of use and the cognitive task involved.

Attention:

An idea has been stated that perpetual partial attention can be created by constant interruptions such as notifications and updates, etc. Technology is said to encourage rapid multitasking and offer constant digital distractions. Constant alerts and fast-moving content can continuously divide and shift an individual's attention, making it harder to fully focus on a single task.

Memory

Technology has made everything a click away, which may raise concerns about how this will affect the human brain's ability to remember information. Studies have shown that excessive use of digital technology can be associated with changes in memory-related processes. When the brain forms new memories, new synaptic connections are created. However, some existing connections can also be weakened or lost as the brain recognizes its connections to strengthen newly formed memories.

The hippocampus is a brain structure that plays a crucial part in memory formation and spatial navigation; it helps create mental representations of surroundings. Anthropologists have found that navigation needs were an important factor in the development of human memory.

Decision making /Critical thinking

In one study, participants who spent more time on social networks showed a higher level of cognitive overload, which was associated with a decrease in their ability to make decisions. Human intelligence simulation is progressively becoming intertwined with human cognition, impacting how we think, learn and perhaps make decisions.

Critical thinking is the clear, rational process of actively questioning, analyzing and evaluating information to make a decision. However, with the intrusion of advanced technology, this process may be minimized when individuals increasingly rely on technology to process information and make decisions.

Research gap

Despite the growing amount of research and studies regarding the psychological effects of advanced technology on human cognitive abilities, a gap remains in understanding the long-term consequences.

Existing studies have examined cognitive functions such as attention, memory and decision-making; however, research on the long-term consequences of continuous reliance on digital technology remains limited.

The rapid, ongoing development of advanced technologies such as artificial intelligence has created new forms of human-computer interaction that require further investigation. Therefore, further research is needed to understand how this sustained reliance on digital technology may influence human cognitive abilities.

Research objectives

To examine the impact of digital technology use on human cognitive abilities, particularly focusing on attention span, memory retention and decision-making abilities. This paper also aims to analyze the beneficial and potentially detrimental effects of digital technology on cognitive functioning and explore how prolonged reliance on digital technology, including emerging technologies such as artificial intelligence, may influence cognitive processes.

Result

The findings from the reviewed studies indicate that digital technology has both beneficial and potentially detrimental effects on human cognitive abilities, depending on the type of technology, usage pattern, duration of use and the cognitive function being examined. The reviewed literature particularly highlights the effects of digital technology on attention, memory and decision-making. While some studies suggest that digital technologies can support cognitive functions by providing quick access to information and other forms of cognitive assistance, other studies have raised concerns regarding excessive reliance on these technologies.

Attention

Digital technologies can have a significant effect on an individual's ability to maintain attention and focus. Constant interruptions from digital distractions create a state of perpetual partial attention, where individuals' attention shifts constantly between different sources of information. Also, rapid multitasking, with fast and constantly changing content on smartphones and digital devices, may contribute to a preference for quick responses and immediate information.

This prolonged exposure to such a digital environment may make it difficult for individuals to maintain sustained attention on a single task.

Memory

Digital technology influences the way individuals acquire, store and retrieve information. The easy accessibility of information through digital devices may encourage individuals to rely on external sources rather than retaining information in their own memory, also known as cognitive offloading. However, studies suggest that it does not necessarily weaken memory, as digital tools support memory through reminders, information storage and easy access to previously stored information.

Decision making / Critical thinking:

Digital technologies also influence the way individuals process information and make decisions. Studies have found that increased exposure to digital platforms can be associated with higher levels of cognitive overload, which may affect an individual's ability to process information and make decisions efficiently. While these technologies can assist individuals by providing quick access to information and supporting problem-solving, excessive reliance on them may reduce the need for independent analysis and reasoning. Critical thinking also involves questioning, analyzing and evaluating information from different perspectives rather than accepting a single point of view. Considering alternative opinions and constructive criticism allows individuals to examine their own reasoning and develop a more informed understanding of an issue.

Conclusion & Future

In conclusion, the review develops a comprehensive framework that demonstrates how the rapid advancement of digital technology does have both beneficial and potentially detrimental effects on human cognitive abilities, depending on the type, duration and manner of usage.

As digital technology is no longer just an occasional tool, but something people have come to rely on excessively, the concerns are no longer about how technology affects cognition, but how continuous reliance may affect it over time.

The growing dependency on digital technology may influence the development and usage of cognitive abilities. While digital technologies make many tasks easier and more efficient, excessive reliance can reduce the need to independently perform certain cognitive processes. Over time, repeatedly depending on technology to perform such tasks may influence how individuals develop and exercise those abilities.

As digital technologies are becoming a routine part of individuals' daily lives, further studies regarding the long-term consequences of excessive reliance on digital technologies are needed. They should examine how prolonged reliance on digital technologies and emerging artificial intelligence tools may influence attention, memory, decision-making and critical thinking over time.

References

1. Barros, E. C. de. (2024). Understanding the influence of digital technology on human cognitive functions: A narrative review. *IBRO Neuroscience Reports, 17*, 415–422. https://doi.org/10.1016/j.ibneur.2024.11.006
2. Chen, C., Huang, N., Hu, B., Zhang, M., Yuan, J., & Guo, J. (2025). The effectiveness of digital technology interventions for cognitive function in older adults: A systematic review and meta-analysis of randomized controlled trials. *GeroScience, 47*(1), 653–683. https://doi.org/10.1007/s11357-024-01446-z
3. International Bureau of Education. (2024, February 23). *Critical thinking and generative artificial intelligence*. UNESCO. https://www.ibe.unesco.org/en/articles/critical-thinking-and-generative-artificial-intelligence
4. Small, G. W., Lee, J., Kaufman, A., Jalil, J., Siddarth, P., Gaddipati, H., Moody, T. D., & Bookheimer, S. Y. (2020). Brain health consequences of digital technology use. *Dialogues in Clinical Neuroscience, 22*(2), 179–187. https://doi.org/10.31887/DCNS.2020.22.2/gsmall