**Background Study**

In the modern digital world, short-form video platforms such as TikTok, Instagram Reels, and YouTube Shorts have become central to how young people consume media. These videos typically 15 to 60 seconds long are designed to capture attention instantly through rapid scene changes, vivid visuals, sound effects, and algorithm-driven personalization (Paltaratskaya,2023). While they offer entertainment and even micro-learning opportunities, their format encourages fragmented, passive consumption that can interfere with deeper cognitive processing. According to Cognitive Load Theory (Sweller,1988), working memory has limited capacity to hold and manipulate information at any given time. When users scroll continuously through short videos, they experience high extraneous cognitive load due to competing auditory and visual stimuli, which overwhelms the phonological loop and visuospatial sketchpad of Baddeley’s (2000) working memory model. This overload reduces the brain’s ability to encode information meaningfully, weakening both short-term retention and long-term memory consolidation (PsychFuel,2023). Moreover, the dopamine-driven feedback loop created by algorithmic rewards conditions the brain to seek novelty and instant gratification (Medrano, 2022), gradually eroding sustained attention the very foundation needed for complex academic tasks like reading comprehension and analytical decision-making (Hollis & Was,2016; Firth, Torous, & Firth, 2020).

In Sri Lanka, where over 8.2 million people actively use social media as of 2025 most of them aged 18–24 (DataReportal,2025) undergraduates in state universities are especially vulnerable to these effects. Many students use short videos during study breaks or late at night, unaware that this habit may impair their ability to retain lecture material or comprehend academic texts (PsychFuel,2023). Crucially, privacy and security concerns act as moderating variables that further tax cognitive resources. As users become aware of data tracking, facial recognition, or exposure to misinformation, they engage in constant privacy calculus (Dinev & Hart,2006), diverting attention from content processing to risk monitoring (Baruh, Secinti, & Cemalcilar,2017). This state of “continuous partial attention” (Kaplan, 1995) not only disrupts working memory but also promotes shallow, surface-level engagement with information exactly the opposite of the deep processing needed for strong reading comprehension (Bartlett, 1932; Otto,2025). When security threats are salient, users may rely more on intuitive, heuristic-based judgments rather than careful analysis (Petty & Cacioppo,1986), compromising decision quality. Despite the growing ubiquity of short-video consumption among Sri Lankan undergraduates, there is a striking lack of empirical research examining how this behavior moderated by privacy and security awareness affects core cognitive functions such as working memory, memory retention, reading comprehension, and decision-making. Addressing this gap is essential, as these cognitive capacities directly underpin academic performance and critical thinking in higher education.

**Problem Statement**

Despite the global rise of short-form video platforms such as TikTok, Instagram Reels, and YouTube Shorts, there is a critical lack of empirical research on their cognitive impact on undergraduate students in Sri Lankan state universities. While international studies suggest these platforms may impair attention, memory, and analytical thinking (Firth, Torous, & Firth, 2020; Paltaratskaya, 2023), such findings cannot be generalized to Sri Lanka due to differences in digital literacy, infrastructure, and academic culture. More importantly, no existing study has simultaneously examined how short-form video consumption affects the four core cognitive domains essential to academic success—working memory, memory retention, reading comprehension, and decision-making—nor has any research tested privacy and security concerns as moderating variables in this population.

This gap is especially concerning given Sri Lanka’s high social media penetration: 8.2 million active users as of 2025, most aged 18–24 (DataReportal, 2025)—precisely the undergraduate demographic. Students routinely use short videos during study breaks or late at night, often unaware of potential cognitive trade-offs. Without localized evidence, educators cannot design effective digital wellness strategies, and students lack guidance on healthy usage.

Working memory—the system that temporarily holds and manipulates information for reasoning and learning (Baddeley, 2000)—is particularly vulnerable. Short videos flood the phonological loop and visuospatial sketchpad with simultaneous auditory and visual inputs, creating high extraneous cognitive load (Sweller, 1988). Continuous scrolling fragments attention, impairing the central executive’s ability to coordinate complex tasks (Hollis & Was, 2016). Over time, neural adaptation to dopamine-driven rewards (Medrano, 2022) may condition the brain to favor instant gratification over sustained focus, directly undermining academic performance.

Memory retention is also at risk due to timing-specific interference. PsychFuel (2023) reports that watching short-form videos immediately after reading significantly impairs story recall—a scenario common among students who scroll between textbook pages. This retroactive interference is amplified in the evening, suggesting pre-sleep video use may disrupt memory consolidation. Given widespread nighttime mobile use (DataReportal, 2025), this habit could silently erode long-term learning.

Reading comprehension suffers not from distraction alone, but from a shift toward surface learning. Otto (2025) shows that even educational short videos often trigger an *entertainment mindset*, reducing deep processing. When students consume content expecting quick rewards, they engage less with inferential or critical aspects of text. This is compounded by reduced “focus stamina”—the ability to sustain attention on lengthy material—as noted by Morgan Virtual Psychiatry (2025). In disciplines requiring close reading (e.g., law, literature), this shift may degrade analytical capacity over time.

Decision-making is compromised through dual pathways: cognitive depletion and security-induced skepticism. The Elaboration Likelihood Model (Petty & Cacioppo, 1986) predicts that when mental resources are low—as after video binges—users rely on peripheral cues (e.g., likes or shares) rather than evaluating evidence. Pennycook and Rand (2019) confirm that rapid content consumption reduces analytical thinking, increasing susceptibility to misinformation—a serious concern in Sri Lanka’s dynamic information landscape. Yet, this link remains unexamined among local students.

Critically, privacy and security concerns intensify these effects. Privacy Calculus Theory (Dinev & Hart, 2006) posits that users continuously weigh platform benefits against privacy risks—a process that consumes working memory resources (Baruh, Secinti, & Cemalcilar, 2017). Awareness of tracking or profiling triggers “continuous partial attention” (Kaplan, 1995), splitting focus between content and self-monitoring. This divided attention undermines encoding and retrieval (Lang, 2000). In Sri Lanka, where privacy literacy is still emerging, such vigilance may be chronic and unmanaged.

Moreover, individual differences in privacy literacy and security self-efficacy likely moderate outcomes. Trepte et al. (2015) show that users with higher privacy literacy automate protective behaviors, freeing cognitive resources. Those with low self-efficacy (Bandura, 1986) may experience persistent uncertainty that drains attention. Without measuring these factors, interventions risk being ineffective.

In sum, the problem is not merely usage—it is that the cognitive consequences of short-form video consumption in Sri Lankan higher education remain invisible and unmeasured. This research addresses that gap by providing the first integrated, theory-driven investigation into how these platforms moderated by privacy and security concerns affect the cognitive foundations of learning among undergraduates in state universities.

**Literature Review**

Short-form video platforms—such as TikTok, Instagram Reels, and YouTube Shorts—have rapidly become dominant forces in the digital lives of young adults worldwide. Unlike traditional media, these platforms deliver content in rapid bursts of 15 to 60 seconds, curated by algorithms that prioritize engagement through novelty, emotional arousal, and personalization (Paltaratskaya, 2023). While entertaining and occasionally educational, their design fundamentally challenges core cognitive processes. For university students, whose academic success depends on sustained attention, deep processing, and reflective judgment, habitual short-video consumption may pose subtle but significant risks. This review examines how these platforms affect four critical cognitive dimensions—working memory, memory retention, reading comprehension, and decision-making—and how privacy and security concerns moderate these effects.

Working memory—the cognitive system that temporarily holds and manipulates information for reasoning, learning, and problem-solving (Baddeley, 2000)—is especially vulnerable to the fragmented nature of short videos. Baddeley’s multi-component model identifies the central executive, phonological loop, visuospatial sketchpad, and episodic buffer as key subsystems. Short videos simultaneously activate the phonological loop (through voiceovers or music) and the visuospatial sketchpad (through dynamic visuals), creating high extraneous cognitive load (Sweller, 1988). Continuous scrolling intensifies this overload, impairing the central executive’s ability to coordinate attention and maintain goal-directed focus (Hollis & Was, 2016). Over time, neural adaptation to dopamine-driven rewards—triggered by algorithmic novelty—conditions the brain to favor instant gratification over effortful tasks (Medrano, 2022). This shift reduces tolerance for activities requiring delayed rewards, such as solving complex problems or analyzing academic texts.

This cognitive fatigue directly undermines memory retention—the ability to store and later recall information. Memory depends on three stages: encoding, storage, and retrieval. Short videos disrupt encoding by fragmenting attention, making it difficult to process information deeply (Firth, Torous, & Firth, 2020). PsychFuel (2023) reports that participants who watched short-form videos immediately after reading a story recalled significantly fewer details, indicating retroactive interference. This effect was strongest in the evening, suggesting that pre-sleep video use may interfere with memory consolidation—a critical process that occurs during rest. Furthermore, the spacing effect, which shows that distributed learning enhances long-term retention (Cepeda et al., 2006), is contradicted by the massed, chaotic exposure typical of short-video binges. Instead of reinforcing memory through repetition, users experience cognitive saturation that weakens durable learning.

Reading comprehension—the active construction of meaning from text—is also at risk. Proficient comprehension relies on prior knowledge (schema theory; Bartlett, 1932), vocabulary, and strategic processing. However, short videos promote a surface learning mindset, where information is consumed quickly and discarded (Otto, 2025). Even when videos contain educational content, users often engage with an *entertainment orientation*, reducing deep processing (Otto, 2025b). This shift is compounded by declining focus stamina—the ability to sustain attention on lengthy material—as noted by Morgan Virtual Psychiatry (2025). When students habitually consume bite-sized content, their brains become less practiced at the slow, reflective processing required for academic reading. Moreover, when videos include text overlays, the split-attention effect forces learners to mentally integrate disjointed visual and verbal streams, increasing cognitive load and reducing comprehension (Ayres & Sweller, 2014).

Decision-making is compromised through dual pathways: cognitive depletion and security-induced skepticism. The Elaboration Likelihood Model (Petty & Cacioppo, 1986) distinguishes between central-route processing (analytical) and peripheral-route processing (heuristic). Short-video environments, characterized by speed and emotional arousal, push users toward the latter. Pennycook and Rand (2019) confirm that rapid content consumption reduces analytical thinking, increasing susceptibility to misinformation—a serious concern in today’s digital landscape. When security threats (e.g., deepfakes, fake news) are salient, users may adopt defensive, shallow processing strategies that paradoxically impair their ability to evaluate credibility.

Critically, privacy and security concerns do not merely coexist with these effects—they intensify them. Privacy Calculus Theory (Dinev & Hart, 2006) posits that users continuously weigh platform benefits against data risks—a process that consumes working memory resources (Baruh, Secinti, & Cemalcilar, 2017). Awareness of tracking or profiling triggers “continuous partial attention” (Kaplan, 1995), splitting focus between content and self-monitoring. This divided attention undermines encoding, storage, and retrieval (Lang, 2000). Emotional arousal from privacy anxiety can also interfere with memory via amygdala-hippocampus interactions (Phelps, 2004).

Individual differences further shape outcomes. Privacy literacy—knowledge of data practices—and security self-efficacy—confidence in managing online risks—act as key moderators (Trepte et al., 2015; Bandura, 1986). Those with high literacy automate protective behaviors, freeing cognitive resources for learning. Those with low self-efficacy may experience persistent uncertainty that drains attention.

In sum, short-form videos affect cognition not in isolation, but through a web of interacting mechanisms: cognitive overload, neural adaptation, emotional interference, and divided attention. Privacy and security concerns add a hidden layer of cognitive cost that has been largely overlooked in prior research. Understanding these dynamics is essential—not to condemn technology, but to design smarter usage patterns, media literacy curricula, and digital environments that support, rather than undermine, the cognitive foundations of learning.