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The Double-Edged Effect of High School Students' Video Usage Behavior on Learning Attention: from Usage Patterns to Regulatory Strategies

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Abstract: *With the deep integration of digital video into the academic and daily lives of high school students, its dual impact on learning attention has become a focal point in education. However, existing research predominantly focuses on the macro-level effects of "screen time," with insufficient exploration of the nuanced influences of behavioral characteristics such as video length and content type. Using a mixed-methods approach, this study investigates the independent and interactive effects of fragmented short videos versus systematic long videos, and knowledge-oriented versus entertainment-oriented content on high school students' learning attention, while analyzing effective regulatory strategies. Results reveal a "double-edged effect": knowledge-based long videos (e.g., science content, online courses) generate cognitive gains, whereas entertainment-driven short videos (e.g., comedy, beauty content) trigger attention fragmentation, learning procrastination, and negative emotions—with the most severe adverse effects occurring during pre-sleep usage. Computer-dominant users demonstrated significantly superior academic performance, concentration, and learning-entertainment balance compared to high-frequency mobile users. Strategies such as physical separation, external supervision, and proactive planning proved effective in mitigating attention decline, while purely technical measures like screen-time restrictions were largely ineffective. This research provides a scientific basis for rational video usage planning and enhanced learning efficiency among high school students.*

Keywords: *High School Students; Video Usage Behavior; Learning Attention; Double-Edged Effect; Regulatory Strategies*

1. Introduction

Video applications in education have become increasingly widespread, particularly at the high school level. Videos serve not only as teaching tools but also as a significant channel for students to acquire knowledge and constitute a major component of daily entertainment. Research indicates that videos possess powerful information delivery and interactive functions, enhancing student learning interest and comprehension[1]. Although video resources expand learning boundaries, their eroding effects on learning attention have attracted significant academic concern [2] [3]. However, a prevalent limitation in current research is its overemphasis on the macro-level impact of "screen time" [4], while neglecting the nuanced influences of behavioral characteristics such as video length, content type, and usage patterns.

This study analyzes videos by categorizing them into fragmented short videos versus systematic long videos (over 30 minutes), while distinguishing between the differential impacts of knowledge-oriented and entertainment-oriented content. The findings can guide students in selecting appropriate video types and controlling viewing duration to protect attention, providing a scientific reference for rationally arranging video-watching and study time, as well as for leveraging videos to enhance learning efficiency.

2. Literature Review

The deep integration of digital video media into education and daily life has increasingly highlighted its eroding effects on high school students' learning attention [5], posing a critical challenge to the efficacy of digital education. Theoretically, this issue intersects educational psychology, cognitive neuroscience, and media communication studies. Its complexity manifests in the yet-unclear dynamic

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mechanisms through which multidimensional behavioral characteristics—such as video length, content type, and usage patterns—affect attentional systems [6] [7]. Traditional "screen time" frameworks fail to explain the differential impacts of fragmented short-form videos versus systematic long-form videos. Practically, issues like declining classroom concentration and rising distraction during homework caused by excessive video browsing not only diminish individual learning efficiency but may also exacerbate imbalances in educational resource allocation.

In recent years, scholars worldwide have extensively researched the relationship between video usage and attention, accumulating substantial empirical evidence and literature. Significant progress has been made in understanding the link between video media and learning attention. For example, Zhang et al.[8] found that video length strongly predicts learning engagement, with learners exhibiting higher attentional involvement during repeated viewing of instructional videos, offering new insights for designing low-cost learning resources. Lai et al.[3] further revealed through eye-tracking experiments that in English learning videos, 70% of attention is directed toward subtitles, while dynamic teacher presence significantly stabilizes attentional trajectories, forming an "subtitle → expression → subtitle" triangular pattern.

With the proliferation of short-form videos, Asif et al.[9] empirically demonstrated that daily consumption exceeding four hours reduces attention span to under eight seconds. Their "random reward mechanism" induces behavioral addiction and depletes cognitive resources. Xu et al. [10] supplemented this by showing that short-form video usage duration negatively predicts working memory capacity in adolescents, with declining Academic Delay of Gratification (ADOG) serving as a key mediator for academic performance deterioration. Gao et al.[11] emphasized that "pan-entertainment" content traps 43% of university students in a "distraction trap," fragmenting information and undermining deep reading abilities.

At the neural level, Bulut[12] synthesized evidence indicating that media multitasking reduces gray matter density in the anterior cingulate cortex, impairing interference resistance. Individuals with ADHD are particularly vulnerable to a bidirectional vicious cycle of "internet addiction → attention deficits." Notably, research on optimizing instructional video design has also advanced. Sweller's[13] cognitive load theory—emphasizing reduced extraneous load, managed intrinsic load, and increased germane load—was empirically validated by Xu[10]: video-based learning groups showed significantly longer attention spans than text-based groups, confirming the cognitive advantage of audiovisual dual-channel integration. Shen et al.[1] further applied multimodal strategies (e.g., in-class comparisons between video and text) in high school English teaching, effectively enhancing cross-cultural understanding.

These studies have progressively deepened insights into the complex relationship between video browsing and learning attention, spanning behavioral, neural, and pedagogical dimensions. However, two critical gaps persist in the literature:

1) The absence of precisely controlled comparative studies examining the combined effects of video length and content type (e.g., 1-minute entertainment short-form videos vs. 30-minute science long-form videos) on attention restoration differences among high school students.

2) The lack of attention-regulation strategy validation grounded in students' subjective experiences (e.g., via interviews).

These gaps constitute the novel contributions of our research.

3. Methodology

3.1 Research Questions

As digital videos become deeply integrated into the lives of high school students, their impact on learning attention reveals a dual nature: knowledge-oriented long videos may be beneficial, while entertainment-driven short videos may be detrimental. Factors such as device type and usage scenarios further complicate this dynamic. Thus, the study addresses the following research questions:

1) How do fragmented short videos versus systematic long videos, and knowledge-oriented versus entertainment-oriented content, independently and interactively affect high school students' learning attention?

2) What are the differential effects of knowledge-based long videos versus entertainment-driven short videos on attention span maintenance?

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

3) What intervention strategies can effectively mitigate attention decline induced by specific video types?

3.2 Participants and Sampling

A stratified random sampling method was employed, with stratification based on four dimensions:

1) Region: Coverage of students from eastern, central, western, and northeastern China to ensure regional representation.

2) Academic Performance: Participants categorized by recent exam rankings: high-achieving (top 20%), moderate (20%–60%), and low-achieving (bottom 40%).

3) Education Stage: All samples comprised current high school students; non-eligible respondents (e.g., non-students) were excluded to maintain a final sample size >100.

4) Video Usage Intensity: Participants classified by daily usage duration and content preference into three groups: High Use/High Impact, High Use/Low Impact, and Low Use/Low Impact. At least three participants from each group were selected for in-depth interviews.

3.3 Data Collection Methods

The study employed a mixed-methods approach implemented across three sequential phases.

1) Phase 1: Quantitative Questionnaire Survey

An online structured questionnaire was administered via the Questionnaire Star platform. The instrument comprised five core modules: demographic information, video usage characteristics, attention metrics, emotional impact, and regulatory strategies. Logical skip patterns and mandatory response requirements were embedded to ensure data validity. Following data collection, rigorous cleaning procedures were applied before conducting statistical analyses using SPSS software, including correlation analysis and regression model testing.

2) Phase 2: Qualitative In-Depth Interviews

Based on Phase 1 results, approximately 10 participants exhibiting typical behavioral profiles were selected for semi-structured interviews. Selection criteria prioritized individuals demonstrating high short-video usage frequency coupled with self-reported high levels of attention fragmentation. Each interview lasted approximately 30 minutes. The protocol commenced with a brief confirmation of participants' basic information and an overview of their electronic device and video platform usage duration. Subsequently, the dialogue focused on three critical dimensions:

Firstly, the dialogue focused on exploring the dynamic relationship between specific types of video content and the process of attention depletion. This analysis examined how factors such as thematic focus, rhythm, or interactive format trigger and maintain attention engagement or dissipation.

Secondly, we conducted a detailed survey of the specific manifestations of video content interference in the cognitive activities of respondents (such as classroom learning or independent learning), including but not limited to the frequency of irrelevant thoughts, emotional triggers, and the resulting cognitive conflicts or efficiency declines.

Thirdly, we systematically evaluated the regulatory strategies participants designed on their own-examining both their effectiveness and their limitations. We then delved into the underlying reasons for their success or failure, paying particular attention to the psychological barriers and situational constraints encountered during implementation.

Interviews utilized open-ended questioning techniques to elicit detailed accounts of lived experiences and coping mechanisms. The research team strictly adhered to ethical principles of informed consent, providing comprehensive study explanations and obtaining written authorization prior to commencement. All interview materials underwent anonymization protocols with usage strictly confined to research purposes.

3) Phase 3: Integrated Data Analysis

A triangulation framework was established to synthesize quantitative and qualitative datasets. Quantitative data analysis identified statistical patterns, while interview transcripts underwent thematic analysis to extract high-frequency responses and keywords. Findings underwent rigorous cross-

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validation between survey results and interview narratives. Ultimately, evidence-based categorical regulatory recommendations were formulated through systematic integration of all empirical evidence.

4. Data Analysis

4.1 Sample Characteristics and Video Usage Behavior Overview

This study sampled current high school students with the following basic characteristics and video usage behaviors:

4.1.1 Demographic Characteristics

The sample comprised 66.1% female and 33.9% male participants, all holding high school diplomas. Academic performance was moderate, with a mean ranking of 2.69 (SD = 1.099) in recent major examinations.

Although the gender distribution diverged from the overall high school population, this skew is methodologically justified: females exhibit more typical video usage behaviors and pronounced attentional effects in this research domain, aligning with sample trends in comparable studies. Potential biases were mitigated through methodological design, reflecting the study's thematic specificity rather than sampling deficiencies.

4.1.2 Video Usage Duration and Frequency

Significant variation existed in the proportion of electronic device time spent on video platforms (mean = 50.28%, SD = 20.445, range: 4%–95%), indicating high dispersion. Daily video software usage duration was moderately high (median = 2–3 hours, mode = 2–3 hours). Long-form video viewing frequency was relatively low (median = 1–4 times weekly, mode = 1–4 times).

These data reveal group commonalities (short-video dominance, elevated duration) and individual differences (disparate usage ratios), establishing a foundation for analyzing differential effects of video types/lengths on attention and targeted regulatory strategies.

4.1.3 Usage Needs and Content Preferences

Demand intensity for video browsing was ranked as follows: entertainment relaxation (mean = 4.01) > time-killing (mean = 3.47) > knowledge acquisition (mean = 3.07) > social interaction (mean = 3.02). Entertainment demand showed high consistency (SD = 0.859), while other needs exhibited marked individual variation. Content engagement priorities were: entertainment/comedy (mean = 3.44) > vlogs (mean = 3.31) > knowledge/science (mean = 3.10) > current affairs/news (mean = 2.86) > gaming (mean = 2.89) > anime (mean = 2.28). Entertainment preferences were concentrated, while other categories demonstrated scattered engagement.

4.1.4 Emotional Impact and Exam Period Behavior

Data revealed a 16.3% higher incidence of negative emotions than positive emotions during the study. Happiness (mean = 3.18) and achievement (mean = 3.13) were moderate, while anxiety prevalence was notably higher (mean = 3.45), exceeding other negative emotions (e.g., lethargy, frustration, irritability). Emotional experiences also varied significantly among individuals (SD = 0.935–1.164). Active reduction of video browsing during pre-exam and exam periods was common (53.5% reduced usage by >50%), yet substantial individual differences existed (SD = 1.145), with 10.2% even increasing browsing time.

4.2 Variable Correlation Analysis

4.2.1 Gender and Digital Media Usage

Gender showed no significant effect on academic performance or video browsing duration but markedly influenced content preferences: males preferred long-form formats, favoring knowledge/science, gaming, and news content; females leaned toward short-form videos, prioritizing beauty, fashion, film/TV entertainment, parenting/pets, and lifestyle vlogs.

Female participants reported higher frequencies of study-related anxiety and burnout, alongside greater perceived negative impacts of short videos on memory consolidation and concentration (e.g., procrastination, phone use during study, memory decline).

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

4.2.2 Academic Performance and Digital Media Usage

1) Academic Stratification Differences:

Top 10% performers: Self-assessed strong study-entertainment balance, high satisfaction with learning states, perceived net positive impact of online videos on academic outcomes, and increased ease in attaining learning pleasure and accomplishment.

Bottom 40% performers: High frequency of electronic device use during free time, difficulty initiating study states, frequent attention dispersion (task-switching tendencies, reduced cognitive efficacy), pervasive lethargy and frustration, and significant time perception biases (poor time management).

2) Key Correlative Factors:

Self-assessed learning satisfaction, academic achievement, preview/review plan implementation, and study-entertainment balance capacity showed significant positive correlations.

This group exhibited a higher preference for deep-learning resources (e.g., science documentaries, online courses) and more frequent experiences of learning pleasure and accomplishment.

4.2.3 Learning Behaviors and Digital Media Usage

Regarding study-entertainment balance, high-balance individuals primarily used videos for knowledge acquisition, demonstrated greater acceptance of long-form and in-depth science content, and minimized video exposure during morning, bedtime, and commute periods. They exhibited more positive emotions and stable attention during the study, reflected in fewer phone distractions, memory decline incidents, and planning delays. Additionally, they displayed rational time management, strong interference resistance, and a preference for computer-based viewing.

Data further indicated that students with preview/review habits reported higher learning state satisfaction and recognized the educational value of videos. They maintained high concentration levels, exercised restrained video usage duration, prioritized learning-oriented content searches (minimizing entertainment exposure), achieved efficient learning state transitions, sustained prolonged focus, experienced strong positive emotions, and demonstrated exceptional planning, execution, and self-regulation compliance.

4.3 Impact Analysis of Digital Media Usage Characteristics

4.3.1 Effects of Video Type and Usage Context

1) Long-Form Videos:

While overall exposure frequency showed no significant correlation with attention dispersion, groups favoring knowledge/science, academic lectures, and news-based long videos demonstrated markedly superior performance. High-frequency consumers of such content exhibited lower attention dispersion rates (knowledge/science content attention level and attention dispersion Pearson correlation = -0.198). Conversely, viewers primarily focused on gaming livestreams or film/TV variety shows displayed significantly higher attention fragmentation and more negative emotions during the study.

2) Short-Form Videos:

Students with higher total short-video usage duration generally exhibited lower deep-learning concentration. Among content categories, only fashion/beauty videos showed a negative correlation with academic performance (Pearson correlation = -0.178). Entertainment/comedy content most readily induced attention dispersion (attention level and dispersion correlation = 0.239), followed by beauty (0.176) and vlogs (0.218).

Additionally, film/TV variety short videos most severely impede learning state initiation (attention level and initiation time correlation = 0.232), with gaming (0.168) and vlogs (0.199) also showing notable correlations.

3) Usage Context:

Pre-sleep video browsing generated the strongest adverse effects, correlating with heightened learning distraction and negative emotions. Significant positive correlations emerged with lethargy (Pearson correlation ≈ 0.3), anxiety (≈0.3), frustration (≈0.3), and burnout (≈0.3). Negative but non-significant correlations were observed with positive emotions (achievement, happiness).

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

4.3.2 Effects of Device Type

Computer-dominant users demonstrated higher learning concentration, significantly superior academic performance (Pearson correlation = 0.234), enhanced study-entertainment balance, greater retention of preview/review habits, stronger recognition of video educational value, higher proactive video retrieval during knowledge gaps, and lower reported short-video-induced memory decline. High-frequency mobile users underperformed across all these metrics.

4.3.3 Effects of Usage Motivation and Platform

1) Motivational Differences:

Users driven by social interaction, entertainment, relaxation, and time-killing formed a homogeneous behavioral cluster, preferring film/TV variety, travel documentaries, and lifestyle content. Their video usage constituted an above-average proportion of electronic device time. Time-killing-dominant users exhibited the poorest learning states (prolonged preparation periods, frequent attention lapses, heightened negativity), followed by social and entertainment-driven users.

Knowledge-acquisition-oriented users focused on online courses, documentaries, and science content. They demonstrated shorter total video exposure, higher long-video ratios, efficient learning state initiation, sustained concentration, no reported memory impairment, strong behavioral regulation (high compliance with anti-addiction mechanisms), and increased video usage intensity during exam periods.

2) Platform Differences:

Bilibili Users: Preferred knowledge/science videos and documentaries; exhibited low engagement with film/TV variety content and marginally higher academic performance.

Rednote & Douyin Users: Favored vlogs, celebrity news, and comedy content. Douyin users showed the weakest attention concentration and learning state initiation efficiency, with the highest video-to-total-device-time ratio. Rednote users were more prone to distraction during study.

4.4 Student Group Differentiation Analysis

4.4.1 Regular vs. International High School students

No significant difference emerged in daily video browsing duration between groups. However, international school students reported stronger negative learning emotions, particularly higher anxiety. They were more susceptible to short-video-induced instability in learning states and exhibited higher pre-sleep video usage frequency. Content preference divergence was notable: regular high school students showed significantly higher engagement with exam-preparation videos.

4.4.2 Difference in Time Perception and Self-Control

Frequent consumers of eating shows, film/TV variety, celebrity content, and vlogs exhibited pronounced time perception distortion, indicating potential addiction. Conversely, viewers prioritizing current affairs/news and exam-preparation content demonstrated stronger self-control, manifesting as stricter adherence to self-imposed usage limits. Gaming video viewers showed the weakest self-control, failing to meet screen-time goals or restrict usage through autonomous means.

Furthermore, individuals struggling to initiate learning states experienced heightened attention dispersion and longer video browsing durations. They reported more negative emotions during the study and perceived study time as subjectively slower than video-watching time, reflecting aversive learning experiences.

4.5 Interview Data Analysis

Analysis of interview data across five dimensions—usage characteristics, motivational contexts, loss-of-control mechanisms, learning impacts, and regulatory strategies—yielded the following conclusions:

4.5.1 Characteristics of Usage Behavior

Interviews revealed significant correlations between browsing volume and learning impact, with disciplinary backgrounds exhibiting potential relevance to video preferences.

1) Browsing volume and duration were positively correlated. Participants significantly affected by short videos reported average daily usage exceeding 2.5 hours, with a mean of approximately 3 hours. In

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

contrast, those minimally affected averaged 1–1.25 hours daily. However, a distinct "high-consumption/low-impact" group existed, with one individual reporting up to 5.5 hours daily. This demonstrates that duration alone is not determinative, suggesting content quality and usage purpose may serve as moderating factors.

2) Disciplinary backgrounds potentially influenced media literacy. Liberal arts students appeared more emotionally driven—all four participants reporting severe impacts were liberal arts majors, citing motivations linked to anxiety and comfort-seeking. Conversely, science students maintained relatively controlled impacts despite high browsing volumes.

3) Clear differentiation emerged between short-form and long-form video users. Short-form users primarily utilized Douyin and Rednote for lightweight content like vlogs and pet videos. Long-form users favored Bilibili and YouTube for in-depth content such as science, history, and politics.

4.5.2 Usage Motivation and Context

Motivational stratification was evident. Short-form users prioritized relaxation, entertainment, and boredom relief. Long-form users emphasized knowledge acquisition. Three out of four high-consumption/high-impact participants explicitly sought emotional comfort through videos.

Usage predominantly occurred during fragmented scenarios. "Boredom," "pre-sleep," and "commuting" were the most frequent contexts, covering eight participants. Emotionally charged scenarios like "anxiety" and "fatigue" followed, reported by five participants.

4.5.3 Mechanisms of Loss-of-Control

Emotional distress and task pressure were primary triggers, with marked group differences.

Key loss-of-control catalysts included anxiety and low mood, reported by six participants, followed by "post-exam revenge mentality" and "final-week stress" cited by four. Task-related scenarios like homework triggered minimal loss of control, mentioned by only one participant.

Group disparities were pronounced. Universal loss-of-control characterized the high-consumption/high-impact group, with three out of four trapped in an anxiety loop: anxiety-triggered video browsing, which then exacerbated anxiety. The low-consumption/low-impact group reported rare incidents, with only one occasional occurrence.

4.5.4 Impacts on Learning

Impact severity depends on duration and content type, with long-form videos demonstrating positive value.

1) Negative impacts were significant and stratified. When asked, "Do video apps positively or negatively affect your learning?", two high-consumption/high-impact participants reported "mostly negative" impacts, one noted "mixed effects," and only one perceived "mostly positive." Among the other six interviewees, five reported "mostly positive" impacts, while one described "mixed effects." High-consumption/high-impact participants also reported more task procrastination, late-night usage, and efficiency loss. Low-consumption/high-impact participants cited procrastination as the primary limiting effect. The low-consumption/low-impact group experienced negligible disruption, with only one reporting mild procrastination.

2) Long-form videos offered tangible benefits. Users described "expanding knowledge horizons," "providing essay material," and "significant learning gains." Short-form users, conversely, attributed increased distraction to "low-quality content."

3) Switching costs varied substantially. Low-consumption participants transitioned more easily to learning tasks—all three with ≈1-hour daily usage reported seamless shifts. Among seven high-consumption users, only one could immediately enter study states; most required a transition time.

4.5.5 Regulatory Strategies

Externally imposed or proactively planned strategies like peer monitoring, parental controls, and physical separation proved effective, reported by four participants. Self-regulated groups relying solely on internal constraints required no additional measures. Critically, all seven participants who attempted technical solutions unanimously reported screen-time restrictions as ineffective, indicating weak efficacy for adolescent behavior management and necessitating complementary interpersonal interventions.

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

5. Discussion and Future Directions

This study provides a detailed exploration of the relationship between high school students' video usage behaviors and learning attention, revealing significant associations and raising new questions. While the findings offer fresh perspectives on this complex domain, they also present limitations that point to critical future research directions:

5.1 Significant but Multifaceted Behavioral Differentiation

The observed behavioral differentiation among high school students—ranging from those trapped in "low-quality short-video consumptive loops" to others gaining benefits through "knowledge-oriented video usage"—is a clear and critical phenomenon. This divergence extends beyond usage duration, intertwining with content preferences, motivations (e.g., entertainment vs. knowledge-seeking), self-regulation capacity, disciplinary backgrounds (liberal arts students showed stronger emotion-driven associations), device choice (computer vs. mobile), and school type (international school students reported stronger negative emotions and distinct content preferences). However, this study primarily established correlations between these factors and behavioral outcomes, failing to fully elucidate causal relationships or specific pathways. Deeper longitudinal or experimental designs are needed to untangle these interactions, enabling the development of precisely targeted, stratified intervention strategies.

5.2 Pervasive Negative Impacts of Entertainment-Oriented Short Videos

Quantitative and qualitative data consistently support significant links between entertainment short videos—particularly comedy, gaming, and fashion/beauty content—and learning procrastination, cognitive fragmentation, and negative emotions, especially during pre-sleep browsing. The observed "anxiety loop" (anxiety → video browsing → heightened anxiety) further clarifies their emotional impact. Nevertheless, this study did not directly measure neural mechanisms or algorithmic processes. We hypothesize that the peak pre-sleep impact may stem from synergistic amplification among circadian rhythms (reduced cognitive control), emotional states, and algorithmic mechanisms. Future research must test this hypothesis by integrating neuroimaging techniques (e.g., fMRI/EEG) with algorithmic log analysis.

5.3 Causal validation is required for Computer Usage Advantages

The academic advantages of computer-based video browsing challenge the traditional assumption of device-neutral impacts, positioning device choice as a key moderator for attention management efficacy. We speculate that computers' physical attributes (e.g., keyboard operation costs, larger screens inhibiting multitasking) and typical usage contexts (more purposeful, less ambient) create lower extraneous cognitive load environments. However, as an observational study, we cannot determine whether device differences directly cause academic disparities or reflect deeper-seated user habits (e.g., computer users may inherently possess stronger self-control or goal orientation). Future research should employ rigorous designs—such as random device assignment under controlled tasks/scenarios—to verify causal device effects and their interactions with usage contexts.

5.4 Low Adoption Limits the Realization of Knowledge-oriented Video Value

Knowledge-based long videos possess potential value, but their practical application efficacy is constrained by limitations in exposure frequency and content attractiveness, necessitating innovative promotion strategies. This study identified a positive correlation between knowledge-based long video exposure frequency and deep learning concentration. Interview subjects also reported auxiliary learning benefits such as knowledge expansion, supporting the positive role of "germane load" in Cognitive Load Theory [13]. However, overall long video exposure frequency remains low among high school students—54% watch >30-minute videos ≤3 Times weekly—resulting in suboptimal real-world application efficacy. We speculate that insufficient appeal of high-quality knowledge videos, inefficient accessibility, and students' limited active screening abilities constitute primary bottlenecks. Therefore, effectively enhancing attractiveness and accessibility while cultivating active utilization capabilities is key to transforming potential into actual value, requiring collaborative efforts from educators, technology developers, and researchers.

ISSN 2663-8169 Vol. 7, Issue 8: 15-24, DOI: 10.25236/IJNDE.2025.070803

5.5 External Scaffolding Outperforms Self-Reliance in Regulation

The efficacy landscape of regulatory strategies reveals widespread limitations in relying solely on self-control. Our practical finding—universal inefficacy of technical tools (e.g., screen-time limits) versus significant effectiveness of externally scaffolded strategies (physical separation, peer/parental supervision) and proactive frameworks (e.g., media schedules)—highlights adolescents' pervasive struggles with Academic Delay of Gratification (ADOG;[10]) capacity against algorithmic temptations. Effective strategies likely succeed by directly reducing extraneous cognitive load or imposing behavioral constraints. However, reliance on self-reports and limited sample size necessitate larger-scale behavioral experiments or intervention studies to verify these strategies' relative efficacy and durability. Pragmatically, structured external support should be prioritized now, while longer-term efforts must integrate media literacy education with endogenous self-regulation skill development (e.g., goal-setting, emotion management) for sustainable autonomy.

6. Conclusion

This study investigated the nuanced effects of video length and type on high school students' learning attention by integrating quantitative surveys, qualitative interviews, and existing theoretical literature. Key findings are as follows:

1) Daily video usage duration among high school students, particularly exceeding 2.5 hours, demonstrates a significant association with attention fragmentation and academic performance decline. Usage motivation and content type serve as critical moderators: Knowledge-oriented long videos (e.g., documentaries, science content, online courses) exhibit substantially weaker negative impacts than entertainment-driven short-video consumption.

2) Entertainment short-form videos are identified as the primary catalyst for attention fragmentation and negative emotions. Both quantitative and qualitative data consistently indicate that such content triggers learning procrastination, cognitive disintegration, anxiety, and lethargy. These adverse effects peak during pre-sleep usage, markedly exceeding impacts observed in other scenarios.

3) Computer-dominant users demonstrate systematic advantages over high-frequency mobile users across multiple metrics: academic achievement, learning concentration, study-entertainment balance, retention of preview/review habits, and self-reported resistance to memory decline.

4) Pure technical interventions (e.g., screen-time restrictions) were universally reported as ineffective, whereas strategies combining external constraints (physical separation, peer/parental supervision) and proactive behavioral frameworks (e.g., media usage schedules) proved significantly effective.

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