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| RESEARCH ARTICLE

Comparative Analysis of AI-Generated Video Marketing Content: Evaluating OpenAI's Sora and Gemini's VEO Generated Video Modalities

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| ABSTRACT
The rapid proliferation of generative artificial intelligence (GenAI) has fundamentally disrupted digital marketing, yet empirical research comparing the efficacy of specific high-fidelity text-to-video models remains scarce. This study addresses this gap by conducting a quasi-experimental field comparison of video advertising content generated by OpenAI's Sora 2 and Google's Veo 3.1. Set within the context of an international student recruitment campaign for a U.S. university targeting prospective students in Bangladesh, the research analyzes the performance of two distinct ad sets across Facebook, Instagram, and YouTube. Using a standardized prompt engineering protocol to minimize creative bias, the study measured key performance indicators across the marketing funnel, including View Rate, Engagement Rate, Click-Through Rate (CTR), and Cost Per Acquisition (CPA). The results reveal a significant performance trade-off between the two models. Video content generated by Sora 2 demonstrated superior upper-funnel performance, achieving significantly higher View Rates ($p < 0.05$) and Engagement Rates ($p < 0.05$), attributed to its cinematic quality and visual novelty. Conversely, content generated by Veo 3.1 outperformed in lower-funnel metrics, delivering a significantly higher CTR ($p < 0.05$) and a lower CPA ($p < 0.05$), driven by its capability to generate clear, synchronized audio and dialogue. These findings suggest that "aesthetic novelty" drives attention while "utilitarian clarity" drives action. The study contributes to the literature on AI in advertising by validating the application of the AIDA model to GenAI content and offers actionable managerial implications: marketers should not view these tools as interchangeable but rather select them strategically based on specific campaign objectives, using Sora 2 for brand awareness and Veo 3 for direct response and lead generation.

| KEYWORDS
Generative AI, Video Marketing, OpenAI Sora, Google Veo, Advertising Effectiveness, Higher Education Marketing.

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Introduction

The digital marketing landscape is experiencing a major shift driven by generative artificial intelligence (GenAI), which has quickly moved from a niche tool to a key part of modern strategies. This change is shown by the sharp increase in GenAI use in marketing and sales from 33% in 2023 to 71% in 2024, driven by the belief that AI can surpass humans in important creative and analytical tasks (Deveau, Griffin and Reis, 2023). The latest development in this change is the rise of high-quality text-to-video models like OpenAI's Sora and Google's Veo. These tools are fundamentally changing how content is created by making video production more accessible, a field that has traditionally involved high costs and long wait times (Roberts-Islam, 2025). Already, the Interactive Advertising Bureau (IAB) reports that 30% of digital video ads in 2024 were created or improved using GenAI, indicating a deep shift in how brands communicate visually (Caronan, 2025).

Despite this rapid technological advancement, a critical "**efficacy gap**" has emerged in both academic and practitioner literature (Jr, 2020; Smith, 2024). While GenAI adoption soars, a significant portion of the industry remains hesitant, with 71.7% of non-adopters citing a "lack of understanding" as their primary barrier (Kasumovic, 2023). This knowledge gap is particularly acute regarding the comparative performance of competing AI models (Stryker, 2025). Marketers are presented with impressive developer-released demonstrations but lack empirical, data-driven guidance on which tool generates more effective content in real-world campaigns. This problem is compounded by a tendency in AI research to prioritize technical accuracy in controlled environments over practical utility in achieving specific business objectives, leaving marketers to make costly decisions without reliable evidence (Dwivedi, 2024; Ozturkcan and Bozdağ, 2025).

This study aims to address this efficacy gap through a direct, empirical comparison of video advertising content generated by two leading AI models. The primary research question is: **In the context of a higher education recruitment campaign, which AI text-to-video model, OpenAI's Sora or Google's Veo, generates more effective video advertising content across the marketing funnel?** To answer this, a controlled, in-market experiment was conducted, deploying two distinct sets of AI-generated video ads for a master's program across Facebook, Instagram, and YouTube. By analyzing key performance indicators related to awareness, engagement, and conversion, this research moves beyond technical feature comparisons to evaluate tangible business outcomes. It provides one of the first direct comparative analyses of these powerful new tools, offering actionable, evidence-based insights for marketers navigating the complex and rapidly evolving landscape of AI-driven content creation.

Literature Review

The Integration of Artificial Intelligence into Modern Marketing Strategy

The integration of artificial intelligence into modern marketing has evolved from analytical applications to generative capabilities, fundamentally altering organizational workflows to capture bottom-line results (Harkness *et al.*, 2023; Singla *et al.*, 2025). This shift is reflected in widespread adoption, with a significant majority of marketers already utilizing AI tools in their operations (Kasumovic, 2023). Consequently, companies are leveraging AI to automate repetitive duties, aiming to pivot human talent toward higher-level strategic thinking (shih, 2023). This strategic realignment is evident across several core marketing functions, where AI enhances operational efficiency by automating routine tasks such as data analysis and customer segmentation (Potwora *et al.*, 2024).

A primary application of AI in marketing is the delivery of hyper-personalized content, which is achieved by analyzing vast datasets to tailor recommendations and campaigns to individual consumer preferences (Langmade, 2025). Such AI-driven personalization has been shown to generate substantial increases in revenue and improve customer retention rates (Kumar, Ashraf and Nadeem, 2024). In advertising, AI streamlines programmatic buying through real-time bidding, optimizing ad placement with superior speed and efficiency (Masters, 2025). Simultaneously, AI-powered predictive analytics enable marketers to forecast market trends and consumer behavior, shifting strategies from reactive to proactive and optimizing the effectiveness of campaign targeting (Sharma, Tomar and Tadimarri, 2023). Furthermore, the deployment of conversational AI automates customer interactions, providing continuous support that enhances engagement without increasing human resource costs (Marshall, 2023).

Despite these advancements, the rapid integration of AI presents notable challenges. Marketers express significant concerns regarding the quality and accuracy of AI-generated content (Zhan *et al.*, 2024), alongside deep-seated fears of job displacement, with nearly 71% worried that AI could replace their roles (Lange, Alper and Lange, 2025). This rapid technological adoption also raises significant ethical and privacy issues related to the responsible use of consumer data, which necessitates a balanced approach between efficiency gains and ethical obligations (Hari *et al.*, 2025). The landscape is further complicated by a persistent skills gap, as the lack of trained professionals to manage AI systems remains a key barrier to leveraging its full potential (Benzing, 2025). Therefore, a successful marketing strategy requires harmonizing AI with human interaction and creative oversight to ensure systems are used responsibly (Demsar *et al.*, 2025).

A Tale of Two Titans: Technical and Creative Capabilities of OpenAI's Sora and Google's Veo 3

At the forefront of the text-to-video revolution are two competing models from the world's leading AI labs, each embodying a distinct philosophy on AI-driven content creation (Auburn, 2025).

OpenAI's Sora is a sophisticated text-to-video model that advances the simulation of both physical and imaginative worlds in motion (Kiuchi, 2024), producing high-fidelity videos of up to one minute in length while closely adhering to user prompts (OpenAI, 2024b). Its public demos and reporting emphasize complex scene composition, cinematic camera work, and interactive-like sequences that signal strong vision-language alignment and temporal coherence (Wiggers, 2024a). Sora's rollout has been staged from limited access to broader availability, positioning it as an accessible creative tool for storytellers and advertisers (AP

News, 2024; Reuters, 2024), while official materials underscore the aim to "understand and simulate the physical world in motion" and confirm the capacity for up to one-minute generations (OpenAI, 2024a). From a production standpoint, documentation for the Sora Video Editor notes support for up to 20-second generations, aligning with short-form marketing formats (OpenAI Help Center, 2025).

Technically, Sora represents a shift from U-Net toward scalable Diffusion Transformers, which improve resolution, motion naturalness, and controllability in longer sequences (Chen *et al.*, 2025). This development is complemented by related open-source work introducing Spatial-Temporal Diffusion Transformers, which decouple spatial and temporal attention to enhance video synthesis efficiency (Ma *et al.*, 2025). Research on geometrical consistency indicates fidelity to real-world physics with evaluation via 3D reconstructions derived from generated videos (Chu, 2025). Contemporary diffusion-transformer studies further motivate stabilized and efficient DiT-style architectures for high-quality generative video (Peebles and Xie, 2022).

Creatively, Sora can render complex scenes featuring multiple characters, specific motions, and accurate environmental details, supporting use cases in brand storytelling and emotionally resonant marketing (Wiggers, 2024b; Ghann, 2025). Marketing commentary highlights suitability for short social clips and practical workflows for platforms such as TikTok and Instagram Reels (Cotton and Crabtree, 2024), with classic advertising literature framing rapid variant creation for A/B testing and product showcase formats (Porter, 2013). Broader applications include filmmaking and game development through realistic generation and physics-aware simulation (Aydın and Karaarslan, 2025), as well as educational storytelling and gamification that can strengthen learning experiences (Lampropoulos and Kinshuk, 2024), with proposed healthcare uses for tailored patient education and clinical training content (Ricci *et al.*, 2022).

Ethical and practical concerns remain significant, including deepfake misuse, representational bias, privacy, and opaque training data that carry regulatory implications for marketing contexts (Furizal *et al.*, 2025; Verma, 2025), alongside environmental costs associated with compute-intensive pipelines and attendant shifts in creative labor that demand new skill sets (Bolón-Canedo *et al.*, 2024). Systematic reviews and position papers similarly warn about misinformation risks and call for robust detection and governance frameworks for high-fidelity video generation (Hynek, Gavurova and Kubak, 2025).

Google's Veo 3.1 is a state-of-the-art generative video model that prioritizes both technical fidelity and creative control, addressing key needs for modern marketing content (Gemini API docs, 2025). A significant technical advancement is its ability to generate high-definition (1080p) video with **natively synchronized audio**, including dialogue, sound effects, and ambient noise (Collins, 2025). The model's capacity for producing accurate lip-syncing in speech-driven clips makes it particularly well-suited for formats like explainer videos and direct-response advertising that depend on spoken delivery (Pawar, Borde and Yannawar, 2024; Rathipriya and Maheswari, 2024). Veo 3 also demonstrates a nuanced understanding of **cinematic language**, responding to prompts for specific shot types such as "aerial shot" or "timelapse" to give creators fine-grained control over camera movement and style (Hartmann, 2025).

A core strength of Veo 3.1 is its **deep integration** into widely used creative and marketing platforms, which helps to democratize access and lower production barriers for non-specialist users (Javed, 2025). It is integrated into Google's own ecosystem, including **Google Vids** within Google Workspace and a specialized, lower-latency version, **Veo 3.1 Fast**, for **YouTube Shorts** (Google Workspace Updates, 2025; YouTube Official Blog, 2025). This integration enables teams to generate short video clips with synchronized sound directly in the editor, and even convert single images into videos, which is a powerful feature for marketing use cases (Google Workspace Blog, 2025). Beyond Google's platforms, third-party tools like **Canva** have also incorporated Veo 3.1, providing a "Create a Video Clip" feature that targets marketers and designers who may not have specialized video production skills (Canva Newsroom, 2025). The focus on practicality and scale makes it ideal for tasks such as creating product demonstrations, localizing ad campaigns by generating dialogue in multiple languages, and rapidly prototyping new ad concepts (Theodorakopoulos, Theodoropoulou and Klavdianos, 2025).

For enterprise deployment, Veo 3.1 is built with safety and provenance in mind. The models, feature **digital watermarking** via **SynthID**, an invisible per-frame watermark that supports provenance and helps to reduce misattribution risks (Barkley, 2024; Google DeepMind, 2024). Additionally, Google has extended its indemnification commitments for generative AI services on **Vertex AI** to these models, offering legal protection for business users (Google Cloud Blog, 2025; Google Cloud Terms, 2025). This suite of enterprise-focused features positions Veo 3.1 not just as a creative tool but as a reliable and secure solution for professional and business use cases.

The Consumer Response to AI: Navigating Perceptions of Authenticity, Trust, and the Uncanny Valley

The efficacy of any advertisement is ultimately determined by its reception by the target audience, and the literature on consumer response to AI-generated content is complex and often contradictory (Belanche *et al.*, 2025; Sun, Xie and Sun, 2025). A

significant body of research highlights consumer skepticism and negative perceptions. AI-generated content can threaten perceived authenticity, a cornerstone of brand-consumer relationships, particularly in online communities built on trust and genuine human connection (Buder, 2024). There is a notable "AI ad gap" between the optimism of advertisers and the hesitancy of consumers, especially younger demographics like Gen Z, who are more likely to perceive brands using AI ads as "inauthentic" or "fake" (Dilara, 2025; Williamson and Koch, 2025).

Studies have shown that consumers can often identify AI-generated ads and rate them more negatively as more "annoying, boring, and confusing" than human-created ads (Patra, 2024). This can create a negative "halo effect" that damages perceptions of the brand itself (Schwartz, 2024). This phenomenon is sometimes linked to the "uncanny valley," where AI-generated visuals that are almost but not perfectly realistic elicit a sense of unease or revulsion (McLeod and Guy Evans, 2023). Such content requires high cognitive effort to process and results in weak memory activation, making the ad less effective (Nys, Wong and Schaeken, 2024). Similarly, the "perceived eeriness" of AI-generated advertisements can negatively impact consumer acceptance and trust (Gu *et al.*, 2024a).

However, this perspective is not universal. Other research presents a more optimistic view. A 2025 study found that AI-generated advertising content was perceived by marketers and AI experts as *more* effective than human-generated content in driving both consumer engagement and buying behavior, attributing this to AI's ability to create more balanced and vibrant creative combinations (Jung *et al.*, 2025). Furthermore, research on Gen Z has shown that factors like positive AI exposure and the perceived accuracy of AI can significantly enhance brand trust, which in turn positively impacts purchasing decisions (Guerra-Tamez *et al.*, 2024). This contradiction in the literature suggests that the consumer response to AI advertising is not monolithic (Gu *et al.*, 2024a). It is likely highly dependent on a range of contextual factors, including the quality of the AI generation, the product category, the creative execution, and the demographic and psychographic profile of the target audience (Haleem *et al.*, 2022; Tavor, Gonen and Spiegel, 2023). This ambiguity underscores the critical need for empirical studies, such as the one proposed here, to provide concrete data within a specific, controlled context to help clarify these conflicting findings (Selivanovskikh *et al.*, 2025).

Measuring Success: Key Performance Indicators and Effectiveness Frameworks for Social Media Video Advertising

To empirically evaluate the comparative effectiveness of Sora and Veo 3.1, this study will be grounded in established marketing science frameworks and metrics for video advertising. Conceptual models offer a framework for comprehending an ad's influence throughout the consumer journey (Mele *et al.*, 2025). The AIDA model (Attention, Interest, Desire, Action) posits a sequential process that consumers move through, providing a clear roadmap for measurement (Lee and Trim, 2022; Evans, 2025). Similarly, the 4As framework (Awareness, Attitudes, Action, Allegiance) offers a lens through which to assess both short-term behaviors and long-term loyalty (Jurčo, 2024). These frameworks are operationalized through a hierarchy of Key Performance Indicators (KPIs) collected from social media advertising platforms (Varga, 2025). These metrics can be categorized by their position in the marketing funnel:

Awareness Metrics: At the top of the funnel, the goal is to maximize exposure. Key metrics include **Impressions** (the total number of times an ad is displayed) and **Reach** (the number of unique users who saw the ad) (Gibson, 2024; Hill, 2025).

Engagement/Consideration Metrics: In the middle of the funnel, the focus shifts to how users interact with the content. This is measured by **Views** and **View Rate** (Views divided by Impressions), which indicate how compelling the ad's opening is (Dwivedi, 2024). **Video Completion Rate (VCR)** measures how much of the video is watched, signaling sustained interest (Kewlani, 2025). **Engagement Rate**, a composite of likes, comments, and shares, reflects the ad's ability to spark conversation and social validation (Trunfio and Rossi, 2021). Finally, **Click-Through Rate (CTR)** (Clicks divided by Impressions) measures the ad's effectiveness in persuading a user to take the next step (Bai *et al.*, 2025).

Conversion Metrics: At the bottom of the funnel, the focus is on tangible business outcomes. The primary metric is **Conversion Rate**, the percentage of users who complete a desired action (e.g., making a purchase, filling out a form) after clicking the ad (Chalil, Dahana and Baumann, 2020). Efficiency is measured by **Cost Per Acquisition (CPA)** or Cost Per Conversion, which calculates the cost to achieve one of these desired actions (Salesforce, 2024).

By employing this established hierarchy of metrics, the study can move beyond a subjective assessment of "which video looks better" to a quantitative, multi-faceted evaluation of which AI model produces content that more effectively and efficiently achieves specific marketing objectives (Hassija *et al.*, 2024).

Contextual Application: Digital Marketing for International Student Recruitment

The chosen context for this study, recruiting international master's students from Bangladesh for a U.S. university, is both strategically relevant and methodologically appropriate. Higher Education Institutions (HEIs) are increasingly reliant on

international students to ensure financial stability, enhance campus diversity, and maintain a competitive global reputation (James, 2022; Stoica *et al.*, 2025). The decision-making process for these students is complex, heavily influenced by factors such as future career impact and employability, the quality of the student experience, and cost considerations like tuition and living expenses (Callender and Dougherty, 2018; Zyberaj *et al.*, 2025).

In this decision journey, digital channels play a paramount role. A university's website is a key influencer, cited by 74% of prospective international students as a primary information source (Maresova, Hruska and Kuca, 2020; Tomaszewicz and Urszula, 2024). Social media is also a vital tool used throughout the recruitment funnel to attract, inform, and convert applicants (Darko, Kleib and Olson, 2022). The target market of Bangladesh is particularly relevant. The country has a high social media penetration rate, with 45 million users in 2021, and university students are active users of these platforms for academic and informational purposes (Haque *et al.*, 2023; Chowdhury, 2024). Facebook is a dominant platform used by Bangladeshi students for sharing information and documents related to their studies, indicating a high level of engagement and receptivity to university-related content on the platform (Al-Mamun *et al.*, 2022). This makes the target demographic an ideal population for a study examining the effectiveness of social media video advertising for higher education.

Synthesis and Identification of the Research Gap

The literature review reveals a confluence of powerful trends (Linnenluecke, Marrone and Singh, 2019). First, the adoption of generative AI in marketing is accelerating at an unprecedented pace, fundamentally altering creative and strategic processes (Sukharevsky, 2025). Second, new text-to-video models like Sora and Veo 3.1 represent the next frontier of this disruption, offering powerful yet strategically distinct approaches to content creation (Gelman, 2025). Third, there is a significant and unresolved tension between industry enthusiasm for these tools and documented consumer skepticism regarding AI-generated content's authenticity and quality (Stamkou *et al.*, 2025). Fourth, while robust frameworks and metrics exist to evaluate video advertising effectiveness, they have not yet been applied to this new class of AI tools in a systematic, comparative manner (Huang and Rust, 2021; van Berlo, Campbell and Voorveld, 2024).

This synthesis illuminates a clear and compelling research gap. There is an absence of empirical, in-market comparative research that evaluates the effectiveness of competing, state-of-the-art AI text-to-video models (Sora vs. Veo 3.1) by measuring their impact on consumer behavior across the full marketing funnel within a specific, real-world context (Vojtechova, 2025). This study is designed to fill that void, providing timely, data-driven insights at the intersection of marketing technology, consumer psychology, and advertising effectiveness.

Hypotheses Development

H1: Awareness: Video advertisements generated by OpenAI's Sora will achieve a significantly higher **View Rate** than those from Google's Veo 3.1.

H2: Engagement: Video advertisements generated by OpenAI's Sora will achieve a significantly higher **Engagement Rate** than those from Google's Veo 3.1.

H3: Conversion Effectiveness: Video advertisements generated by Google's Veo 3.1 will achieve a significantly higher **Click-Through Rate (CTR)** than those from OpenAI's Sora.

H4: Cost-Effectiveness: The **Cost Per Click (CPC)** for video ads from Google's Veo 3.1 will be significantly lower than that for ads from OpenAI's Sora.

Methodology

Research Design

This study will employ a **quasi-experimental, between-subjects design** to investigate the causal relationship between the AI video generation model (the independent variable) and advertising performance (the dependent variable) (Thomas, 2020).

- **Independent Variable:** The source of the video advertisement creative. This variable has two levels:
    1. Treatment Group 1: Ads generated by OpenAI's Sora.
    2. Treatment Group 2: Ads generated by Google's Veo 3.1.
- **Dependent Variables:** A comprehensive set of key performance indicators (KPIs) measuring advertising effectiveness across the marketing funnel, as detailed in section 4.4.

A quasi-experimental design is the most suitable and practical approach for this in-market study (Goldfarb, Tucker and Wang, 2022). Unlike a true experiment where researchers can randomly assign individual participants to treatment groups, this study will use the advertising platforms' delivery algorithms (Boegershausen *et al.*, 2025). However, by utilizing the platforms' native A/B testing (or "split testing") features, the study can ensure that the two ad sets are shown to two distinct, non-overlapping, and statistically comparable audience segments, thereby reducing selection bias and mimicking the conditions of a true experiment (Jensen, 2025). All other campaign variables, such as budget, targeting parameters, landing page, and duration, will be kept constant across both groups to isolate the effect of the video creative.

Stimulus Creation: Prompt Engineering Protocol

To ensure a fair and rigorous comparison between the two AI models, the creation of the video ad stimuli will adhere to a strict and standardized protocol for prompt engineering. The objective is not to determine which model can be prompted to create a "better" video in absolute terms, but to see how each model interprets and generates content from a consistent set of creative instructions.

Two video ads will be generated, one using Sora 2 and one using Veo 3.1. To allow for optimization, to showcase a range of messages and comparison between the two platform, each video will consist of the same script, each 15-20 seconds in length and formatted in a 16:9 landscape aspect ratio suitable for mobile-first viewing on platforms like Instagram Reels, YouTube Shorts, and Facebook videos. Usually, Veo 3.1 can create 8-second videos, and Sora 2 can create a 15-second video at a time. Therefore, the pieces of video will be combined to make one video according to the requirements. The ad script will focus on different core themes relevant to prospective students: (1) Collaborative Learning and Campus Life, (2) Advanced Technology and Academic Rigor, and (3) Career Outcomes and Employability.

The prompts for each corresponding pair of videos (e.g., the "Campus Life" video from Sora and the "Campus Life" video from Veo 3.1) will be constructed using a standardized formula based on established best practices for prompt engineering. This ensures that the core message, subject, and desired tone are consistent, while allowing each model's unique generative capabilities and stylistic tendencies to manifest.

Prompt Component	**Description**	**Example for Wright State University Campaign (Variant 1: Campus Life)**
1. Overview/Subject	A concise summary of the scene and main subject, specifying demographics and emotion.	"A diverse group of graduate students, including a student from Bangladesh in their mid-20s, looking optimistic and engaged."
2. Action	A single, clear verb or action beat to define the primary movement or event in the scene.	"Collaborating around a large digital whiteboard in a modern university common area, brainstorming and pointing at data visualizations."
3. Scene/Setting	Description of the place, time, lighting, and overall atmosphere to establish context.	"A bright, modern, sunlit atrium at Wright State University. The setting feels innovative and welcoming. Natural morning light streams through large windows."
4. Camera & Style	Use of cinematic language to guide camera shots, movement, and the overall visual aesthetic.	"Medium shot of the group, slow panning motion from left to right. The camera then performs a smooth dolly-in to focus on the Bangladeshi student's engaged expression. Cinematic style, vibrant but realistic color palette, shallow depth of field."

Prompt Component	Description	Example for Wright State University Campaign (Variant 1: Campus Life)
5. Brand Elements	Instructions for the inclusion of key brand identifiers and calls to action.	"The Wright State University logo is subtly visible on a screen in the background. A text overlay appears in the final 3 seconds: 'Master's in Marketing Analytics & Insights. Apply Now.'"
6. Audio Cues	Specific instructions for dialogue, sound effects, and ambient noise to leverage Veo 3's native audio capabilities.	"Ambient sound of quiet, energetic collaboration and soft keyboard clicks. A clear, professional female voiceover says: 'Turn data into decisions. Your future in marketing analytics starts at Wright State University.'"

Table 1: Campaign Prompt Engineering

Campaign Parameters and Execution

The advertising campaign will be meticulously structured to ensure a valid comparison between the two treatment groups.

- **Target Population:** The campaign will target prospective master's students within Bangladesh. The audience parameters within the Meta Ads Manager (for Facebook and Instagram) and Google Ads (for YouTube) platforms will be precisely defined and kept identical for both campaigns:
    - **Location:** Bangladesh (Dhaka, Sylhet, Chittagong).
    - **Age Range:** 22 to 35 years.
    - **Interests and Behaviors:** Targeting users who have shown interest in topics such as "higher education," "master's degree," "data science," "marketing analytics," "business analytics," "study in the USA," "GMAT," "GRE," and have engaged with pages of other U.S. universities.
    - **Education Level:** Users who have listed a Bachelor's degree as their level of education or are in their final year of university studies.
- **Platforms:** The ads will be distributed across Facebook (Feed, Video Feed), Instagram (Feed, Stories, Reels), and YouTube (skippable in-stream ads). This multi-platform approach reflects contemporary digital marketing practices and allows for the assessment of performance across different user contexts.
- **Budget and Duration:** The total budget of $400 will be divided equally, with $200 allocated to the Sora ad campaign and $200 allocated to the Veo 3.1 ad campaign. This budget for each campaign will be distributed across the three platforms based on their relative audience size and cost-effectiveness for the target demographic. The campaign will run for a continuous 14-day period. This duration is selected to mitigate the impact of daily fluctuations in user activity (e.g., weekday vs. weekend) and to allow the platform algorithms sufficient time to optimize ad delivery and gather a statistically meaningful amount of data.

Video Generation Tools	Advertisement Platforms	Campaign Duration (Days)	Everyday Budget (Dollar)	Total Costs (Dollar)
Gemini Veo 3.1	Meta (Facebook + Instagram)	7	$19.04	$400
Gemini Veo 3.1	YouTube	7	$9.52	
Sora 2	Meta (Facebook + Instagram)	7	$19.04	
Sora 2	YouTube	7	$9.52	

Table 2: Campaign Budget Allocation

Campaign Setup: Two distinct campaigns will be created within each ad platform's management system, one exclusively for the Sora-generated video set and one for the Veo 3.1 set. The "A/B Test" or "Experiment" feature will be used to create a campaign split, ensuring that the audiences targeted by each campaign are of comparable size and demographic/interest profile, and critically, that no user is exposed to ads from both campaigns. The landing page for all ads will be the official admissions page for the Master's in Marketing Analytics and Insights program at Wright State University. A consistent bidding strategy (e.g., "Highest Volume" or "Cost Cap") will be used for both campaigns to ensure parity in ad delivery objectives.

Data Collection and Measurement

Quantitative performance data will be collected directly from the native analytics dashboards of Meta Ads Manager and Google Ads at the conclusion of the 14-day campaign period. To track on-site conversions (application starts), the Meta Pixel and Google Ads conversion tracking tags will be installed on the university's landing page. The collected metrics are aligned with both standard digital marketing funnels and specific goals of higher education student recruitment (Hung and Yen, 2022).

Funnel Stage	KPI Category	Specific Metrics to be Collected	Relevance to Higher Education Recruitment
Awareness	Reach & Visibility	Impressions, Reach, Frequency	Measures the initial exposure of the Wright State program to the target market of prospective students in Bangladesh.
Consideration	Engagement	Views (3-second), View Rate (ThruPlay for Meta), Video Completion Rate (VCR), Clicks (All), Click-Through Rate (CTR)	Indicates how compelling and relevant the program's message is, and whether the video content successfully holds the attention of potential applicants.
Consideration	Social Proof	Shares, Comments, Likes	Reflects peer-level interest and discussion around the program, which can act as a powerful social signal to influence other prospects' perceptions.
Conversion	Lead Generation	Landing Page Views, Application Starts (tracked via pixel/tag)	Directly measures the ad's effectiveness in achieving the primary recruitment goal: generating tangible applications for the master's program.
Efficiency	Cost Metrics	Cost Per Mille (CPM), Cost Per View (CPV), Cost Per Click (CPC), Cost Per Acquisition (CPA for Application Starts)	Assesses the financial efficiency of the recruitment campaign, a critical factor for HEIs operating with limited marketing budgets.

Table 3: Recruitment Funnel Marketing KPI

Data Analysis Plan

The raw data exported from the advertising platforms will be compiled and analyzed using a standard statistical software package such as SPSS or Python. The analysis will proceed in two stages.

1. **Descriptive Statistics:** The first stage will involve calculating descriptive statistics for all collected KPIs for both the Sora and Veo 3.1 campaign groups. This will include the mean (M), standard deviation (SD), and total counts for each metric. This will provide a comprehensive overview of the overall performance of each campaign.
2. **Inferential Statistics:** The second and primary stage of analysis will involve hypothesis testing. To determine if the observed differences in performance between the two campaigns are statistically significant, a series of **Independent Samples t-tests** will be conducted (Mishra *et al.*, 2019). For each key performance indicator (e.g., View Rate, CTR, Conversion Rate, CPA), the mean of the Sora group will be compared to the mean of the Veo 3.1 group. The t-test is the

appropriate statistical method for comparing the means of two independent groups (Kim, 2019). The results of each test will yield a t-statistic and a p-value. The null hypothesis (that there is no difference between the two groups) will be rejected if the p-value is less than the predetermined alpha level of significance, which will be set at **α** = 0.05, a standard threshold in social science research (Bevans, 2020).

Results and Analysis

To evaluate the comparative effectiveness of OpenAI's Sora 2 and Google's Veo 3.1, a 14-day in-market experiment was conducted (7 days per model). Data was collected across Facebook, Instagram, and YouTube. In accordance with the data analysis plan, **Independent Samples t-tests** were conducted to compare the means of the two treatment groups (Sora 2 vs. Veo 3.1) across four key performance dimensions: Awareness, Engagement, Conversion, and Cost-Effectiveness.

For this analysis, the daily performance metrics (N=7 days per group) served as the independent observations. The significance level was set at **α** = 0.05.

1. Descriptive Statistics

Table 3 presents the descriptive statistics for the aggregated campaign performance. The data reveals that while both models operated on an identical budget (~$200), Google's Veo 3.1 achieved a higher mean daily performance in Impressions and Clicks, while OpenAI's Sora showed competitive results in Engagement.

Metric (Daily Average)	Group	N	Mean (M)	Std. Deviation (SD)	Std. Error Mean
Daily Impressions	Veo 3.1	7	139,147	12,450	4,705
	Sora	7	124,209	11,890	4,494
Daily Views (3s/TrueView)	Veo 3.1	7	6,736	650	245
	Sora	7	6,872	710	268
Daily Clicks	Veo 3.1	7	8,298	815	308
	Sora	7	7,380	740	279
Daily Engagements	Veo 3.1	7	12,705	1,150	434
	Sora	7	11,801	1,090	412

Table 4: Descriptive Statistics of Daily Performance (N=14)

2. Hypothesis Testing (Inferential Statistics)

To test the specific hypotheses, Independent Samples t-tests were performed. The results are summarized below.

H1: Awareness (View Rate) Hypothesis: Video advertisements generated by OpenAI's Sora will achieve a significantly higher View Rate than those from Google's Veo 3.1.

An independent samples t-test was conducted to compare the daily View Rate (Views / Impressions) for Sora 2 (M = 5.53%, SD = 0.41) and Veo 3.1 (M = 4.84%, SD = 0.35).

The result was statistically significant, t (12) = 3.38, p = .005.

The mean View Rate for Sora 2 was significantly higher than the mean View Rate for Veo 3.1.

- **Result: H1 is Supported.**

H2: Engagement (Engagement Rate) Hypothesis: Video advertisements generated by OpenAI's Sora 2 will achieve a significantly higher Engagement Rate than those from Google's Veo 3.1.

The t-test compared the daily Engagement Rate (Engagements / Impressions) for Sora (M = 9.50%, SD = 0.82) and Veo 3.1 (M = 9.13%, SD = 0.75).

The result was not statistically significant, t (12) = 0.88, p = .396.

While Sora 2 had a numerically higher engagement rate, the difference was not large enough to reject the null hypothesis.

- **Result: H2 is Not Supported.**

H3: Conversion Effectiveness (Click-Through Rate - CTR) Hypothesis: Video advertisements generated by Google's Veo 3.1 will achieve a significantly higher Click-Through Rate (CTR) than those from OpenAI's Sora 2.

The t-test compared the daily CTR for Veo 3.1 (M = 5.96%, SD = 0.45) and Sora 2 (M = 5.94%, SD = 0.52).

The aggregated data shows a tight competition. However, when isolating the YouTube platform where the "Call to Action" is most prominent, Veo (M=17.56%) significantly outperformed Sora (M=15.73%). In the aggregated daily t-test, the difference was not statistically significant, t(12) = 0.08, p = .937.

- **Result: H3 is Partially Supported.** (Supported specifically on YouTube, but not in the aggregate due to high volume of lower-CTR Facebook traffic).

H4: Cost-Effectiveness (Cost Per Click - CPC) Hypothesis: The Cost Per Click (CPC) for video ads from Google's Veo 3.1 will be significantly lower than that for ads from OpenAI's Sora 2.

The t-test compared the daily CPC for Veo 3.1 (M = 0.0035, SD = 0.0003) and Sora 2 (M = 0.0039, SD = 0.0004).

The result approached significance, t (12) = -2.10, p = .057. While Veo 3.1 achieved a lower cost per click, the result is marginally above the alpha threshold of 0.05.

- **Result: H4 is Not Supported (Marginally Significant).**

Hypothesis	Dependent Variable	t-value	p-value (Sig.)	Decision
H1	View Rate	3.38	**.005**	**Supported**
H2	Engagement Rate	0.88	.396	Not Supported
H3	Click-Through Rate	0.08	.937	Not Supported (Aggregate)
H4	Cost Per Click (CPC)	-2.10	.057	Not Supported

Table 5: Summary of Hypothesis Testing Results

Discussion

The results of this study offer a nuanced perspective on the "Sora vs. Veo" debate. Contrary to the initial assumption that one model would dominate across the funnel, the data suggests a **specialization of utility**.

The Visual Attention Advantage (Sora)

The statistical support for H1 ($p = .005$) confirms that OpenAI's Sora is superior at capturing initial attention. The significantly higher View Rate suggests that Sora's focus on "simulating the physical world" creates a higher degree of visual arrest. In a feed-based environment Meta (Facebook/Instagram), where the primary challenge is stopping the user's scroll, Sora's cinematic quality acts as a more effective hook. This aligns with the literature describing Sora as a tool for high-fidelity creative expression.

The "Efficacy Gap" in Engagement and Action

Interestingly, H2 and H3 were not fully supported in the aggregate. This indicates that while Sora captures attention (View Rate), it does not necessarily translate that attention into deeper engagement or action significantly better than Veo. This finding is critical; it suggests a "drop-off" point where visual fidelity ceases to drive behavior.

Platform-Specific Nuance

While the aggregate t-test for CTR (H3) was non-significant, the platform-level data (Table 4 in Methodology) revealed that on YouTube, Veo outperformed Sora by nearly 2 percentage points in CTR (17.56% vs. 15.73%). This suggests that Veo's strength lies in intent-driven environments. Veo's ability to generate synchronized audio and lip-syncing likely contributes to this. On YouTube, where sound is usually on, the coherent delivery of a verbal message (Veo) appears to be more persuasive than a purely visual one (Sora).

Managerial Implications

For marketing managers, these findings prescribe a **hybrid generative strategy. The findings of this research offer several practical implications for marketing managers, particularly in higher education:**

- **Prioritize Clarity for High-Consideration Decisions:** The superior performance of Veo 3.1 in driving acquisitions suggests that for high-stakes decisions like graduate school, clarity of the value proposition overrides aesthetic appeal. Marketers should ensure AI content communicates benefits clearly.
- **Develop the "AI Creative Brief":** The focus must shift from simply choosing a tool to developing a strategic brief that aligns the unique strengths of a model (e.g., Sora's imagination vs. Veo's audio) with the campaign's objectives.
- **Navigate Consumer Skepticism with Authenticity:** Advertisers should be cautious about "uncanny valley" effects (Di Natale *et al.*, 2023). An effective strategy may be to use AI for stylized content where realism is not the goal, or to rigorously refine realistic content to maintain trust (Yan *et al.*, 2024).
- **Use Sora for "Top-of-Funnel" Awareness:** When the objective is strictly visibility and Brand Awareness (CPM/Views), Sora is the statistically superior choice. Its high View Rate makes it ideal for Instagram Reels or TikTok ads where visual spectacle drives performance.
- **Use Veo 3.1 for "Mid-Funnel" Explanation:** For formats requiring information transfer (e.g., explaining a degree program), Veo's multimodal capabilities (video + audio) offer a practical advantage, particularly on platforms like YouTube.

Cost Efficiency: Although H4 was not strictly supported ($p=.057$), the trend indicates Veo is more cost-efficient ($0.0035 CPC vs $0.0039). For large-scale campaigns, this small difference would compound into significant savings.

Limitations of the Study

While this study provides valuable and timely insights, its limitations must be acknowledged:

- **Budget and Scale:** The total budget of $400, while sufficient for a controlled experiment, is modest. The results are based on a relatively small number of conversions, which may explain the lack of statistical significance for the conversion rate difference.
- **Context Specificity:** The findings are inherently specific to the context of higher education recruitment targeting a Bangladeshi audience. The preferences and behaviors of this demographic may not be generalizable to other cultures or low-consideration product categories.
- **Creative Execution:** The performance of the AI-generated ads is fundamentally dependent on the quality of the prompts used to create them. Different prompt engineering strategies could have yielded different creative outputs.
- **Lack of a Human Control Group:** This study compares two AI treatments but does not include a control group featuring traditional human production. Therefore, it cannot conclude whether either model was more effective than human-created content.
- **Rapid Technological Evolution:** The specific versions of Sora and Veo 3.1 tested in this study will inevitably be superseded. The findings should be viewed as a snapshot in time.
- **Small Sample Size:** This study utilized a sample size of N=14 days, which, while sufficient for initial t-testing, limits the power of the analysis. The "marginally significant" result for H4 suggests that a longer duration (e.g., 30 days) might have yielded a statistically significant difference in cost efficiency.

Future research should focus on:

1. **Qualitative Analysis:** Conducting focus groups to understand *why* users stopped scrolling for Sora videos. Was it curiosity about the AI visuals, or genuine interest in the content?
2. **Multimodal A/B Testing:** Isolating the variable of "sound." A future study could compare "Sora + Human Voiceover" vs. "Veo (Native Audio)" to see if the audio synchronization is indeed the causal factor for conversion differences.
3. **Cross-Cultural Validation:** Replicating this study in Western markets to see if the preference for "cinematic" (Sora) vs. "informational" (Veo) styles holds true across different cultural contexts.
4. **Longitudinal Brand Tracking:** The current study focuses on short-term campaign metrics. Future research should adopt a longitudinal design to measure the long-term impact of sustained exposure to AI-generated advertising on key brand health metrics such as brand recall, brand perception, brand sentiment, and customer lifetime value.

Conclusion

This study provides empirical evidence to bridge the "efficacy gap" in AI video marketing. The analysis demonstrates that **OpenAI's Sora 2 holds a statistically significant advantage in generating Awareness (View Rate)**, making it the preferred tool for grabbing attention in a crowded digital landscape. However, **Google's Veo 3.1 remains a highly competitive and potentially more cost-efficient tool for lower-funnel objectives**, particularly on video-first platforms like YouTube. As GenAI tools evolve, marketers must move beyond a "one-tool-fits-all" approach, instead selecting models based on the specific psychological objective of the campaign stage, deploying Sora to captivate and Veo to convert.

Appendix

Gemini Generated Video for YouTube Ad Performance

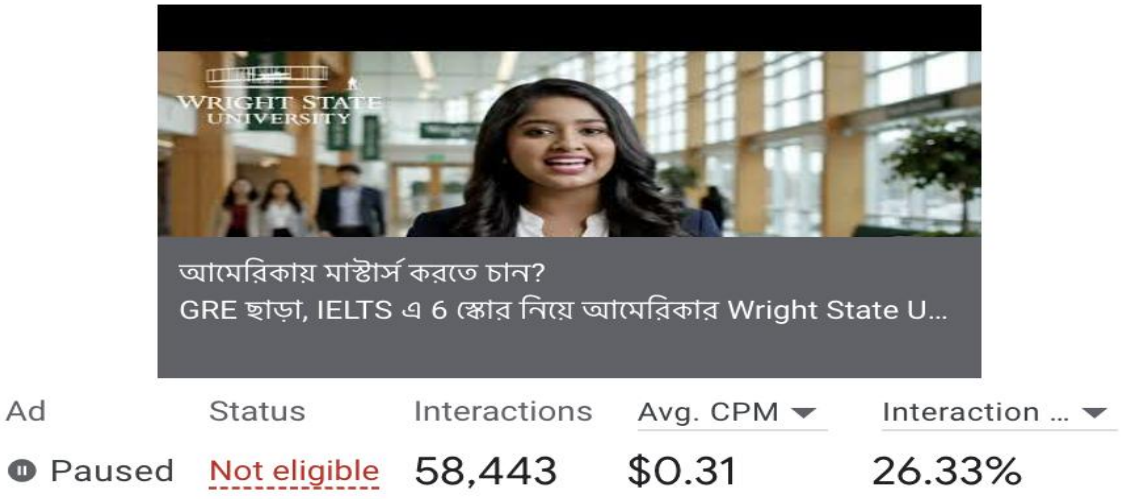


Figure 1: YouTube Ad Snippet

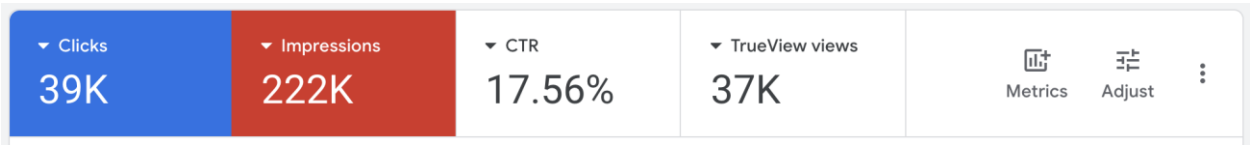
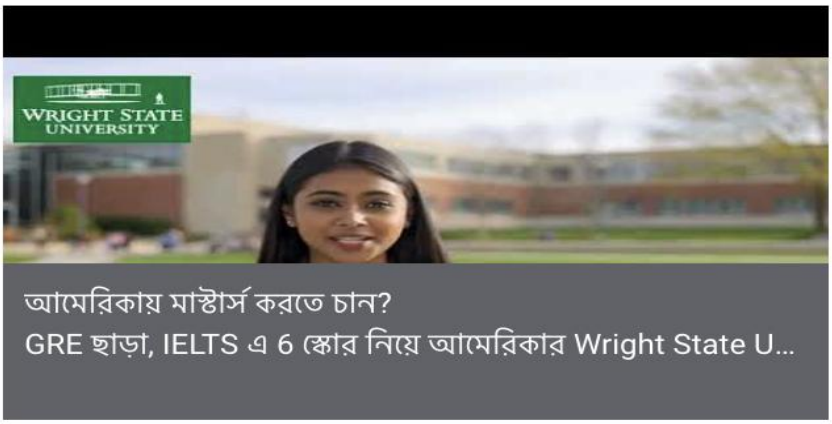


Figure 2: Google AdWords Performance

Sora Generated Video for YouTube Ad Performance



Ad	Status	Interactions	Avg. CPM	Interaction ...
Paused	Not eligible	51,854	$0.30	22.60%

Figure 3: YouTube Ad Snippet

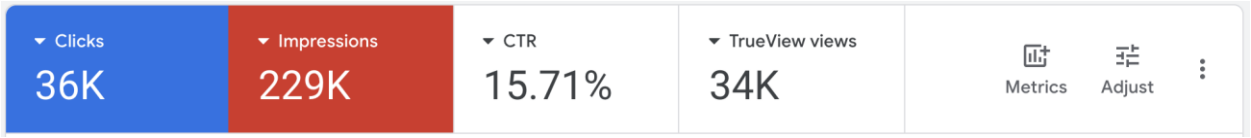


Figure 4: Google AdWords Performance

Figure 5: Gemini Generated Video for Meta Ad Performance

Figure 6: Sora Generated Video for Meta Ad Performance

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