STUDENT PERCEPTIONS OF AI-GENERATED VIDEOS IN ONLINE LEARNING

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ABSTRAK: Penelitian ini menggunakan pendekatan campuran untuk menginvestigasi persepsi mahasiswa sarjana di Indonesia terhadap video yang dihasilkan AI dalam pembelajaran daring. Didorong oleh integrasi AI yang cepat dalam pendidikan dan adanya celah penelitian, studi ini bertujuan untuk memahami secara komprehensif perspektif mahasiswa tentang pembelajaran video berbasis AI. Data dikumpulkan dari 100 responden survei kuantitatif dan 15 informan wawancara kualitatif, menggunakan kuesioner skala Likert terstruktur (menilai engagement, tantangan, dan kegunaan) serta panduan wawancara semi-terstruktur. Temuan menunjukkan persepsi yang sangat positif terkait tingkat engagement (Mean=4.32) dan kualitas visual (Mean=4.15) video yang dihasilkan AI, sejalan dengan prinsip pembelajaran multimedia yang menekankan desain visual efektif. Namun, area yang memerlukan perhatian signifikan meliputi kemudahan navigasi (Mean=3.98) dan, khususnya, kecepatan narasi (Mean=3.12). Wawasan kualitatif mengkonfirmasi nilai personalisasi, visualisasi, dan fleksibilitas, namun menyoroti tantangan seperti kualitas audio, interaktivitas rendah, dan kelelahan kognitif akibat penyampaian monoton. Mahasiswa mengungkapkan harapan kuat terhadap fitur adaptif, penilaian tersemat, dan dukungan multimodal yang kuat. Penelitian menyimpulkan bahwa meskipun video AI memiliki potensi transformatif besar, keberhasilan integrasinya bergantung pada prioritas desain pedagogis yang berpusat pada mahasiswa, berfokus pada penyampaian konten adaptif, interaktivitas yang ditingkatkan, dan pengalaman pengguna yang lebih baik untuk memaksimalkan hasil belajar.

Kata Kunci: Video hasil AI, pembelajaran daring, persepsi mahasiswa, keterlibatan belajar

ASTRACT: *This mixed-methods study investigates Indonesian undergraduate students' perceptions of AI-generated videos in online learning. Driven by the rapid integration of AI in education and a recognized research gap, the study aims to comprehensively understand student perspectives on AI-video learning. Data was collected from 100 quantitative survey respondents and 15 qualitative interview informants, utilizing a structured Likert scale questionnaire (assessing engagement, challenges, and usability) and a semi-structured interview guide. Findings reveal overwhelmingly positive perceptions regarding student engagement (Mean=4.32) and visual quality*

(Mean=4.15) of AI-generated videos, aligning with multimedia learning principles that emphasize effective visual design. However, areas requiring significant attention include ease of navigation (Mean=3.98) and, particularly, narration speed (Mean=3.12). Qualitative insights confirm the value of personalization, visualization, and flexibility, but highlight challenges such as audio quality, low interactivity, and cognitive fatigue from monotonous delivery. Students express strong desires for adaptive features, embedded assessments, and robust multimodal support. The research concludes that while AI-generated videos hold immense transformative potential, their successful integration hinges on prioritizing student-centered pedagogical design, focusing on adaptive content delivery, enhanced interactivity, and improved user experience to truly maximize learning outcomes.

Keywords:*AI-generated video, online learning, student perceptions, learning engagement,*

PENDAHULUAN

The landscape of education has undergone a profound transformation in recent years, largely propelled by rapid advancements in digital technologies(Arora et al., 2023a; Karmakar & Das, 2024). Online learning, once a supplementary mode of instruction, has now firmly established itself as a primary educational delivery method, offering unprecedented flexibility and accessibility to a global student population. This shift has necessitated a continuous exploration of innovative tools and strategies to enhance the efficacy and engagement within virtual learning environments. Concurrently, the burgeoning field of Artificial Intelligence (AI) has emerged as a disruptive force, demonstrating immense potential across various sectors, including education(Arora et al., 2023b; Maurya et al., 2023; Surugiu et al., 2024). AI-generated content, particularly video, is increasingly being explored as a scalable and customizable solution to address the diverse needs of learners. These AI-powered video tools can automate content creation, personalize learning experiences, and potentially reduce the burden on educators. However, the integration of such novel technologies into established educational paradigms is not without its complexities. While the technological capabilities are rapidly advancing, a critical dimension that remains underexplored is the student perception of these AI-generated educational videos. Understanding how students perceive the quality, utility, and impact of AI-generated video content is paramount to ensuring its effective and ethical integration into online learning ecosystems. Without a clear understanding of student perspectives, the promise of AI in education may fall short of its potential, leading to suboptimal learning outcomes and missed opportunities for true pedagogical innovation(Akavova et al., 2023; Carin, 2020).

To fully appreciate the significance of student perceptions, it's essential to delineate the core concepts underpinning this inquiry. Online learning refers to education delivered through digital platforms, where students can access course materials, interact with instructors and peers, and complete assignments remotely. This mode of learning has evolved significantly, moving beyond simple content delivery to embrace interactive multimedia, collaborative tools, and sophisticated learning management systems. Its advantages, such as flexibility, scalability, and access to a wider range of courses, have made it a cornerstone of modern education. Parallel to this, Artificial Intelligence (AI) encompasses a broad range of computational technologies designed to simulate human intelligence(Queiroz et al., 2024). This

includes machine learning, natural language processing, computer vision, and expert systems. In the context of content creation, generative AI models are particularly relevant. These models, often powered by deep learning, can generate novel content, including text, images, audio, and video, based on vast datasets they've been trained on. AI-generated video refers to video content produced using these AI algorithms, often with minimal human intervention. This can range from automatically generated summaries of lectures with synthesized voices and animated avatars to fully created instructional videos based on textual inputs or existing data. The allure of AI-generated video lies in its potential to rapidly produce diverse learning materials, personalize content based on individual learning styles, and even translate and localize content for global audiences, thereby addressing the challenges of content creation at scale in online learning(Aswan, 2024b, 2024c; Marín Rodriguez et al., 2023; Rifqi Putra Adhadi et al., 2024).

Despite the growth of online learning, significant challenges persist, particularly in the realm of content creation. Traditional video production is often resource-intensive, requiring considerable time, budget, and expertise in scriptwriting, filming, editing, and post-production. This often limits the quantity, variety, and recency of educational videos available to students. Furthermore, tailoring content to individual student needs or rapidly updating materials to reflect new information can be a laborious process, hindering the agility required in dynamic fields of study. The static nature of many online courses can also lead to decreased student engagement and a perception of a less personalized learning experience. Historically, alternative solutions have included outsourcing video production, utilizing open educational resources (OERs), or relying heavily on text-based materials and static presentations. While these approaches offer some relief, they often fall short in terms of cost-effectiveness, customization, or engaging multimedia delivery. For instance, OERs may not always align perfectly with specific curriculum requirements, and text-heavy courses can lead to cognitive overload and reduced student motivation. The emergence of AI-generated video presents a promising alternative, aiming to overcome these limitations by automating and streamlining the content creation process, offering scalability and personalization previously unattainable. However, this promising solution introduces new questions regarding its pedagogical effectiveness and, crucially, how learners will perceive and engage with content that lacks a traditional human touch(Baker, 2016; Bradáè & Kostolányová, 2017; Shah et al., 2002).

While the technical capabilities of AI in video generation are advancing rapidly, there exists a significant research gap concerning the student perceptions of AI-generated videos in online learning. Much of the existing literature focuses on the technical aspects of AI video creation, or on the general effectiveness of online learning, without specifically addressing the nuanced impact of AI-generated content on student engagement, comprehension, and satisfaction. Questions remain about how students perceive the authenticity, credibility, and pedagogical value of videos produced by algorithms rather than human instructors. Do students feel a sense of detachment or artificiality when interacting with AI-generated avatars or voices? Does the lack of a human instructor's visible presence affect their trust in the content or their overall learning experience? Furthermore, there is a need to understand if different types of AI-generated video (e.g., animated characters, synthesized voices, or real footage with AI overlays) evoke different student responses. Without addressing these critical questions, the widespread adoption of AI-generated videos in online learning could be met with resistance or result in unintended negative consequences for student learning and well-being.

These research endeavors should meticulously identify the specific attributes of AI-generated videos that students find either engaging or problematic. It's also crucial to conduct comparative analyses of these perceptions against those elicited by human-produced educational video(Dangi et al., 2025; Yanjin et al., 2023)s. Furthermore, investigating the moderating role of individual differences—such as prior experience with AI

technologies, distinct learning styles, and varying levels of technological readiness - will provide a more nuanced understanding. Consequently, the overarching objective of this research is to systematically investigate and comprehensively understand student perceptions regarding the utilization of AI-generated videos within the pedagogical framework of online learning. This foundational understanding will serve as an indispensable basis for formulating evidence-based best practices and guiding the effective implementation of these technologies. Ultimately, deciphering these student perceptions will offer invaluable insights for instructional designers, educators, and AI developers. This knowledge will empower them to craft AI-generated video content that not only harnesses technological advancements but also genuinely resonates with learners, thereby maximizing its potential to significantly enhance the quality and accessibility of online learning experiences. This line of inquiry is paramount to ensuring that the integration of Artificial Intelligence into educational video production transcends mere technological achievement, evolving instead into a pedagogically sound and profoundly student-centered innovation(Bervell et al., 2022; Cervantes López et al., 2025; Fauziyati, 2023)

METODE

This study employs a mixed-methods approach to analyze Indonesian undergraduate students' perceptions of learning engagement and the challenges they face when using AI-based videos for online learning(Ary et al., n.d.; Creswell & Creswell, n.d.). The research population comprises students who have utilized AI videos in their learning over the past year. A purposive sampling technique will be used to select 100 respondents for the quantitative phase and 15 informants for in-depth interviews in the qualitative phase.

Quantitative data will be analyzed using descriptive statistics (mean, standard deviation), construct validity testing, and reliability analysis with Cronbach's Alpha. Pearson correlation will also be utilized to explore relationships between variables.

Qualitative data will undergo thematic analysis, involving transcription, open coding, and theme categorization, with member checking ensuring validity. Finally, method triangulation will be employed to integrate findings from both quantitative and qualitative approaches, with statistical analysis supported by SPSS software.

This study uses two primary instruments to collect both quantitative and qualitative data. The first instrument is a structured 5-point Likert scale survey questionnaire, designed to quantitatively measure student perceptions. This questionnaire has three main sections: (1) learning engagement, which assesses aspects like attention, interaction, and motivation through statements such as "AI videos help me stay focused during learning"; (2) challenges, identifying technical issues, content comprehension difficulties, or usage barriers with questions like "I found it difficult to understand explanations in AI videos"; and (3) usability, evaluating the video's interface and navigation.

The second instrument is a semi-structured interview guide for gathering in-depth qualitative data. This guide contains open-ended questions crafted to explore student experiences in more detail, such as "Could you explain the biggest challenge you faced when using AI videos?" or "How was your experience using AI videos compared to traditional learning materials?" These interviews will be conducted in-depth to gain a comprehensive understanding of the students' perceptions and challenges.

HASIL DAN PEMBAHASAN

The table presents the demographic distribution of participants involved in this research, encompassing both the quantitative and qualitative phases. A comprehensive overview of these sample characteristics is crucial for accurately contextualizing the study's findings and for evaluating the extent to which the results can be generalized.

Tabel 1. Serbaran Sampel

Variabel	Kategori	Kuantitatif (n=100)	Kualitatif (n=15)	Total
Jenis Kelamin	Laki-laki	42 (42%)	6 (40%)	48 (42%)
	Perempuan	58 (58%)	9 (60%)	67 (58%)
Tingkat Studi	Tahun 1	28 (28%)	4 (27%)	32 (28%)
	Tahun 2	35 (35%)	5 (33%)	40 (34%)
	Tahun 3+	37 (37%)	6 (40%)	43 (38%)
Frekuensi Penggunaan	e"3x/minggu	38 (38%)	6 (40%)	44 (38%)
	1-2x/minggu	45 (45%)	7 (47%)	52 (45%)
	<1x/minggu	17 (17%)	2 (13%)	19 (17%)

Based on Table 1, a total of 115 undergraduate students participated in this study, comprising 100 questionnaire respondents and 15 interview informants. The gender distribution shows a slight dominance of female participation (58%) compared to male (42%) across both groups. The majority of participants were from higher academic years, with 38% in their third year or above and 34% in their second year. Regarding the frequency of AI video usage, most participants (45%) reported using it 1-2 times a week, followed by 38% who used it 3 times a week. This demographic proportion was relatively consistent between the quantitative and qualitative samples, indicating that the interview informants adequately represented the diversity of survey respondents. This diverse sample composition allows for a comprehensive exploration of perceptions and challenges from various student backgrounds, providing a strong foundation for the findings to be discussed further (Hariyati, 2019; Hariyono & Yuswatiningsih, 2019).

To gain an initial understanding of how students perceive AI videos, Table 2 below displays descriptive statistics from the responses of 115 quantitative respondents.

Tabel 2. Statistik Deskriptif Persepsi Mahasiswa Terhadap Video AI

Variabel	Mean	SD	Sangat Setuju (5)	Setuju (4)	Netral (3)
Engagement	4.32	0.71	38%	45%	12%
Kualitas Visual	4.15	0.68	35%	48%	13%
Kemudahan Navigasi	3.98	0.82	28%	42%	22%
Kecepatan Narasi	3.12	1.05	15%	23%	35%

The results of the descriptive analysis clearly show that students have a very positive perception of the level of engagement offered by AI videos (Mean = 4.32), with a significant majority (83%) agreeing or strongly agreeing. This finding aligns with Cognitive Theory of Multimedia Learning, which emphasizes the importance of effective multimedia design to minimize extraneous cognitive load and maximize information processing. The high quality of engagement indicates that AI videos are able to retain students' attention and facilitate active learning processes. This success is likely supported by the perceived very positive visual quality of AI videos (Mean = 4.15). Clear, engaging, and relevant visuals can reduce extraneous cognitive load and aid sense-making, as proposed by the multimedia and spatial contiguity principles in Mayer's theory. Previous research also often highlights that the quality of visual and audio production is a crucial factor influencing student satisfaction and engagement with video-based learning materials, including those generated automatically(Moin et al., 2020; Seo et al., 2021; Silliman et al., 2022).

Although aspects of engagement and visual quality received excellent responses, there are indications that ease of navigation (Mean = 3.98) and especially narration speed (Mean = 3.12) require more attention. The proportion of respondents who were "Neutral" (22%) for ease of navigation and "Neutral" (35%) for narration speed, as well as the lower mean values, suggest a mismatch or potential obstacle in the learning experience. The issue

of ease of navigation can be linked to the coherence and signaling principles in multimedia theory, where an unintuitive interface or lack of clear visual cues can disrupt the learning flow and cause frustration (Mayer, 2001). Students may find it difficult to replay certain sections, jump to specific topics, or effectively control playback speed(Mokhtar & Othman, 2022; Qin et al., 2022; Román-Sánchez et al., 2023).

The lower perception of narration speed is a significant finding. This reflects challenges in personalizing the learning pace. Each individual has a different learning style and information processing speed. Monotonous or unadjustable AI narration can cause information overload for some students or, conversely, be too slow for others, thereby reducing learning efficiency and effectiveness. Research on adaptive learning consistently shows that the ability to control and adjust content delivery speed is a key feature that enhances satisfaction and learning outcomes. A lack of flexibility in AI narration speed can limit student learning autonomy, which is an important element in effective online learning (Ekayana, 2023; Kuncoro & Hidayati, 2021; Liu & Elms, 2019)

Overall, these descriptive findings underscore the strengths of AI videos in fundamental aspects such as visual quality and engagement potential, which are essential foundations for effective online learning. However, they also reveal that optimization in user interaction and content adaptability, particularly narration speed, are critical areas for further development. These results affirm that the implementation of AI in education is not just about the technology's ability to generate content, but also about how that content is designed to interact optimally with learners' cognitive processes and individual preferences. Further qualitative research is expected to provide in-depth understanding of why narration speed is an issue for some students, as well as how navigation challenges can be overcome, thereby guiding the development of best practices and more pedagogical AI video designs in the future.

Based on an in-depth analysis of interviews with 15 students, this study reveals diverse perceptions and experiences related to the use of AI-based videos in online learning. The qualitative findings narrow down to three main aspects: supporting factors for learning engagement, challenges faced, and future development expectations(Aswan, 2022, 2024a; Noya et al., 2022).

In terms of learning engagement, students highlighted the value of content personalization as a key advantage. One participant from Informatics Engineering explained, "AI videos on the LMS always adjust their recommendations based on my previous learning notes. This makes me feel the content is truly relevant." The aspect of visualization also drove engagement, especially for complex material. A Chemistry student stated, "3D animations about molecular structures helped me understand concepts that were difficult for the lecturer to explain through text." Learning time flexibility was also appreciated, with one Psychology respondent noting, "I can rewatch parts I don't understand without feeling like I'm burdening anyone else."

However, the use of AI videos is not without technical and pedagogical challenges. Audio quality issues were a frequent complaint, as revealed by a Law student: "The robotic voice sometimes disrupts concentration." Network limitations also affected the learning experience, especially when videos buffered. Furthermore, the lack of interactivity was perceived as a barrier. "I wish I could ask the AI directly when I don't understand, not just watch," said an Economics student. Some participants also complained of cognitive fatigue after watching for a certain duration, with one Literature student stating, "After 20 minutes, my attention starts to wane due to the monotonous delivery style."

Future development expectations include several fundamental improvements. Students desired adaptive features that could adjust playback speed to the user's comprehension level(Iankova et al., 2020; Siregar et al., 2024; Siregar & Aswan, 2019). A Physics participant opined, "It would be great if the playback speed could automatically adjust to my understanding." Integration of short

assessments was also proposed to enhance learning retention, as expressed by a Biology student: "It would be better if there were short quizzes after each video segment." Additionally, multimodal support such as alternative text was considered important to accommodate diverse learning styles.

These findings are not only consistent with quantitative data—for instance, in the decrease of engagement after a certain duration—but also provide in-depth insights into users' actual needs. The implication is that the development of educational AI videos needs to prioritize not only technical aspects but also pedagogical elements centered on the student learning experience.

This research delves into the realm of AI-Powered Video Learning, a promising field in modern education, by comprehensively analyzing various aspects that shape its ecosystem. The findings of this study can broadly be categorized into three main pillars: the support offered, the challenges faced, and the expectations placed on this technology.

From the perspective of support, AI-Video Learning proves to bring a number of advantages that can revolutionize how we learn. The ability to achieve personalization stands out as one of its primary strengths, where AI systems can intelligently tailor video content, the pace of material presentation, and even the learning style to align with each individual's unique needs and preferences. This creates a learning experience that is not only relevant but also far more effective. Furthermore, the inherent aspect of visualization in video is an invaluable asset. Even complex concepts can be unpacked and dynamically visualized, often making them easier to grasp and retain compared to merely reading static text. Flexibility also emerges as a key attraction; learners gain flexibility in terms of access and study time, enabling them to learn anytime and anywhere, according to their personal rhythm and schedule(Almalhy, 2022; Hadriani, 2021).

However, the implementation of AI-Video Learning is not without challenges that demand serious attention. One crucial hurdle is technical issues; disruptions such as unstable internet connectivity, device compatibility problems, or software bugs can significantly impede the smooth flow of the learning process. Another challenge is the potential for low interactivity. Inherently, video can be a one-way medium, and without well-designed interaction mechanisms, learners may feel passive and less engaged. Moreover, sub-optimal video design or an overly dense presentation of information can induce a high cognitive load on learners, hindering their ability to effectively process and comprehend the material(Bravo et al., 2011; Brega & Kruglyakova, 2021).

Nevertheless, this research also highlights the significant expectations placed on the future development and utilization of AI-Video Learning. There are high expectations for the evolution of more sophisticated adaptive features, where AI goes beyond merely presenting content, but intelligently adjusts difficulty levels, provides instant feedback, or even recommends learning paths tailored to a student's performance and comprehension. Another expectation is the integration of embedded assessments directly into the learning videos. This allows for real-time evaluation of student understanding and the provision of relevant feedback without needing to switch to a separate assessment platform. Finally, the future of AI-Video Learning is also expected to encompass stronger multimodal support, not only relying on visuals and audio but also integrating other interactive elements such as text, simulations, and even immersive technologies like virtual reality or augmented reality to enrich the overall learning experience.

SIMPULAN DAN SARAN

Simpulan

This research has thoroughly explored the domain of Artificial Intelligence-Powered Video Learning (AI-Video Learning), a promising innovation in the landscape of modern education. We found that this technology offers extraordinary transformative potential, particularly through its ability to provide unprecedented content personalization, enhance the visualization of complex concepts that are difficult to explain with traditional methods, and offer unparalleled learning flexibility for students to access material

anytime and anywhere according to their individual pace. This forms a strong foundation for creating a learning experience that is not only relevant and engaging but also highly effective.

Nevertheless, the journey of implementing AI-Video Learning is not without its obstacles. We identified that technical issues, ranging from unstable internet connectivity to device compatibility problems, remain significant challenges that can disrupt the smooth flow of the learning process. Furthermore, the potential for low interactivity in a one-way video format risks making learners feel passive and less engaged, while suboptimal design can trigger excessive cognitive load. Specifically, data indicates that although aspects of engagement and the visual quality of AI videos are perceived very positively, the ease of navigation and especially the speed of AI narration still require significant improvement, indicating a gap in adapting to individual learning styles.

Saran

amidst these challenges, there are great hopes for the evolution of AI-Video Learning. Students explicitly desire smarter adaptive features to adjust the learning pace, the integration of embedded assessments directly within videos for instant feedback, and stronger multimodal support to accommodate diverse learning preferences. Therefore, the success of AI-Video Learning's adoption and development in the future will heavily depend on how we manage to overcome existing challenges while continuously realizing these aspirations. This underscores that the key to AI implementation in education lies not merely in the technology's capacity to generate content, but rather in how that content is pedagogically designed to interact optimally with the unique cognitive processes and learning preferences of each student. To that end, future development must prioritize adaptive features, enhanced interactivity, and a deep understanding of user experience, in order to create a truly transformative learning ecosystem

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