

The Effectiveness of Marketing Using Virtual Content Creators (Influencers) on Millennial Consumers' Purchase Decisions

Taqwa Sultan¹✉, Septia Sakalini Dioh²

^{1,2}Politeknik Negeri Kupang, Indonesia

✉ tatandentha@gmail.com *

Article Information:

Received August 02, 2026

Revised September 22, 2026

Accepted October 21, 2026

Published October 29, 2026

Keywords: *Virtual Influencer;*
Influencer Marketing;
Purchase Decision

Abstract

Virtual influencers, computer-generated personas that create content and endorse brands on social media, are increasingly used to reach millennial consumers, yet evidence on whether they actually drive purchase decisions remains fragmented across disciplines, product categories, and generational cohorts. This study aims to synthesize current empirical and conceptual evidence on the effectiveness of virtual influencer marketing for millennial consumers' purchase decisions. A systematic literature review following the PRISMA 2020 protocol was conducted on publications from 2021 to 2026 retrieved from Consensus and Google Scholar. From 41 records identified, 25 peer-reviewed studies with active DOIs met the inclusion criteria and were analyzed through descriptive mapping and thematic synthesis. The findings show that virtual influencers can be as persuasive as human influencers when three conditions converge: credible source attributes (trustworthiness, expertise, attractiveness), engaging and useful content, and a congruent product category, particularly visual and technology-related products rather than sensory ones. The effect on purchase decisions is rarely direct; it travels through consumer engagement, perceived value, positive emotion, and parasocial relationships. For millennials, utilitarian value and credibility weigh more than novelty, while perceived inauthenticity and undisclosed artificiality remain the main barriers. This study proposes an integrative Credibility–Engagement–Decision framework and offers practical guidance for brands targeting millennial consumers in emerging markets such as Indonesia

INTRODUCTION

Influencer marketing has moved from the margins of promotional practice to the center of digital marketing strategy. Brands no longer rely only on paid advertising to reach consumers; they borrow the voice, image, and social capital of individuals who have built large and loyal audiences on platforms such as Instagram, TikTok, and YouTube. A recent meta-analysis confirms that social media influencers affect consumer attitudes and behavior through several psychological mechanisms, including source credibility and parasocial relationships, and that these effects vary with platform, product, and audience characteristics (Barari et al., 2025). Within this landscape, a new category of endorser has emerged: the virtual influencer, a computer-generated character that posts content, interacts with followers, and collaborates with brands as if it were a human creator, even though it does not physically exist (Arsenyan & Mirowska, 2021; Mouritzen et al., 2024).

The rise of virtual influencers is driven by the promise of control and scalability.

Unlike human creators, virtual influencers can be fully customized, deployed flexibly across campaigns, owned outright by brands or agencies, and increasingly automated through artificial intelligence (Mouritzen et al., 2024). They do not age, fall ill, or become entangled in personal scandals, and their appearance and personality can be engineered to fit a brand's identity. Survey evidence suggests that consumers are increasingly attracted to virtual influencers and may perceive them as trustworthy, credible, and relevant to their preferences, which in turn raises purchase intention (Gerlich, 2023). At the same time, scholars warn that this artificiality creates new risks: consumers may question the authenticity of endorsements from an entity that has never used the product, and the line between persuasion and deception becomes harder to draw (Lou et al., 2022; Lee et al., 2024).

Millennial consumers, generally defined as those born between roughly 1981 and 1996, occupy a strategic position in this debate. They are the first cohort to grow up alongside the commercial internet, they now hold substantial purchasing power as working adults and young parents, and they remain heavy users of social media for product discovery. Research on millennials shows that digital influence plays a meaningful role in their purchasing decisions, especially in visually driven categories such as fashion and beauty (Sanchez-Alarcón et al., 2023). However, millennials differ from Generation Z in how they evaluate online endorsers. Studies comparing generational cohorts indicate that the pathways from perceived value and source credibility to engagement and purchase intention are not identical across age groups (Cao et al., 2025; Tuzzahro, 2026). Much of the virtual influencer literature has concentrated on Generation Z, who are assumed to be the natural audience for digital avatars (Wang et al., 2025). Whether the same persuasive logic holds for millennials, who are older, more experienced as consumers, and arguably more skeptical of advertising, remains insufficiently understood.

The empirical literature on virtual influencer effectiveness has grown rapidly since 2021, but its findings are scattered and at times contradictory. One stream reports that virtual influencers can match or even outperform human influencers. Credibility attributes of AI influencers, such as trustworthiness, expertise, and attractiveness, have been found to increase consumer engagement and, through it, purchase intention (Jayasingh et al., 2025). Content quality and influencer credibility jointly drive engagement and purchase intention (Angmo et al., 2025), and engagement has been identified as a key mediator even in specialized categories such as organic food (Liu et al., 2026). Human-like virtual influencers appear to trigger emotional mechanisms that translate into purchase behavior (Yadav & Kumar, 2026), while playfulness and expertise build the trust that underpins consumer responses (J. Kim et al., 2024).

A second stream highlights boundary conditions and limitations. Virtual influencers are perceived as less authentic than human influencers, although this gap narrows among consumers who hold a strong belief that machines are objective and accurate, the so-called machine heuristic (Lee et al., 2024). Their effectiveness is sensory-specific: virtual influencers are less persuasive for products whose key attributes must be touched, tasted, or smelled, because consumers doubt that a digital entity can genuinely experience such products (Zhou et al., 2023). The degree of human likeness also involves trade-offs. More realistic anthropomorphic images do not automatically yield higher purchase intention (Pan et al., 2024), and human-like virtual influencers tend to inspire more trust while anime-like ones generate more novelty (E. Kim et al., 2024). Comparative work further shows that human influencers retain advantages on several dimensions of consumer response (Belanche et al., 2024), and that diversity cues embedded in virtual personas shape how consumers evaluate them (Ferraro et al., 2024).

These contrasting results suggest that the question is no longer whether virtual influencers work, but under which conditions, through which mechanisms, and for which consumers. Theoretical lenses used to answer this question are also diverse. Studies draw on source credibility theory, social influence theory (Davlembayeva et al., 2024), parasocial interaction theory (Garg & Bakshi, 2024), technology acceptance models such as AIDUA

(Kembau et al., 2025b), and the computers-as-social-actors paradigm (Arsenyan & Mirowska, 2021). Without an integrative synthesis, marketers and researchers lack a coherent picture of how these mechanisms combine to shape purchase decisions.

The Indonesian context makes this question especially pressing. Indonesia is one of the world's largest social media markets, with around 170 million users, and local virtual influencers are increasingly visible in brand campaigns (Kembau et al., 2025a). Recent Indonesian studies among users aged 18 to 35, a range that spans younger millennials and Generation Z, show that positive emotion is the strongest driver of willingness to accept virtual influencers, while perceived risk and social influence play a smaller role (Kembau et al., 2025b). Other findings indicate that virtual influencers generate stronger positive emotion when followers judge them useful, whereas human influencers are more easily forgiven when content feels clumsy (Kembau et al., 2025a). In a related vein, relatability, trustworthiness, and authenticity of influencers shape purchase intention among Indonesian Generation Z and millennials through emotional value and parasocial relationships (Tuzzahro, 2026). These studies, however, focus on acceptance, emotion, or intention rather than on the purchase decision itself, and they seldom isolate millennials as a distinct segment.

Three gaps emerge from the literature. First, most studies measure purchase intention rather than the broader purchase decision process, which includes need recognition, information search, evaluation of alternatives, choice, and post-purchase evaluation. Second, millennials are rarely examined as a distinct cohort in virtual influencer research; they are either merged with Generation Z or left out entirely. Third, the mechanisms identified across studies, namely credibility, content, anthropomorphism, engagement, emotion, and parasocial bonds, have not been integrated into a single explanatory model that links virtual influencer attributes to millennial purchase decisions. The novelty of this article lies in three contributions. It is, to the authors' knowledge, the first systematic review to center millennial consumers in assessing the effectiveness of virtual influencer marketing, contrasting their responses with those of Generation Z where evidence allows. It proposes an integrative Credibility–Engagement–Decision (CED) framework that maps influencer attributes, mediating mechanisms, boundary conditions, and decision outcomes onto the stages of the consumer purchase decision process. Finally, it situates global evidence within the Indonesian market, drawing on recent local studies to derive implications for brands operating in mobile-first, collectivistic economies.

Accordingly, this study addresses three research questions. RQ1: What characterizes recent research on virtual influencer marketing and consumer purchase responses? RQ2: Which attributes and mechanisms explain the effectiveness of virtual influencers on purchase decisions, particularly among millennials? RQ3: Which boundary conditions limit this effectiveness, and what are the implications for theory and practice?

METHODS

This study used a systematic literature review (SLR) design guided by the PRISMA 2020 reporting protocol. An SLR was chosen because the research questions concern the state, mechanisms, and boundary conditions of an evidence base that is growing quickly but remains fragmented across marketing, communication, and human–computer interaction journals. The review combined descriptive mapping of study characteristics with a thematic synthesis of findings.

Search strategy

The search was conducted on 27 October 2026 in two stages. The primary search used Consensus, an academic search engine that draws on the Semantic Scholar corpus, with two queries: "The Effectiveness of Marketing Using Virtual Content Creators (Influencers) on Millennial Consumers' Purchase Decisions" and its Indonesian equivalent, "efektivitas pemasaran berbasis pembuat konten (influencer) virtual terhadap keputusan pembelian konsumen milenial". Each query returned 16 records, giving 32 records in total. A supplementary search was then run in Google Scholar using the string *"virtual influencer" AND ("purchase intention" OR "purchase decision" OR "consumer engagement") AND*

("millennial" OR "Indonesia" OR "human influencer"), which added 9 records not captured by the primary search, including Indonesian studies and widely cited conceptual works.

Eligibility Criteria

Studies were included if they (1) were published between 2021 and 2026; (2) appeared in a peer-reviewed journal; (3) had an active DOI that resolved to the publisher's page and was indexed in Google Scholar; (4) examined consumer responses to virtual influencers, or influencer mechanisms directly relevant to millennial purchase decisions, such as trust, engagement, emotion, purchase intention, or purchase behavior; and (5) were written in English or Indonesian. Studies were excluded if they were theses, conference proceedings, editorials, or commentaries; if the publishing outlet did not meet basic quality checks such as transparent peer review and indexing; or if they did not report any consumer-level outcome.

Selection process

Of the 41 records identified, 8 were duplicates across the two Consensus queries and were removed, leaving 33 unique records. Titles and abstracts were then screened against the eligibility criteria. Eight records were excluded at this stage: two were grey literature (a master's thesis and a conference proceeding), two were published in outlets that did not meet the quality checks, and four were reviews or commentaries that did not report consumer-level outcomes. The remaining 25 articles were retrieved in full, assessed for eligibility, and all were retained for synthesis. Figure 1 summarizes the selection process.

41 records narrowed to 25 included studies

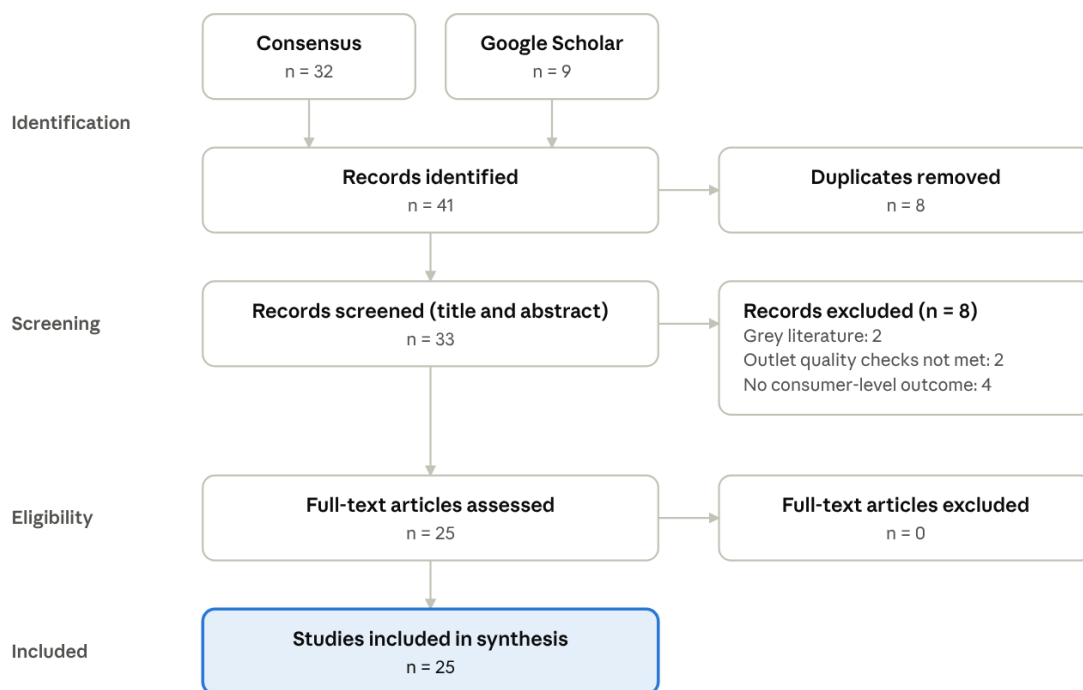


Figure 1 · PRISMA 2020 flow of study selection

Data extraction and analysis

For each included study, the following data were extracted into a coding matrix: author and year, country or market context, research design, focal constructs, the outcome variable, and the principal finding. Analysis proceeded in two steps. First, descriptive mapping summarized the distribution of studies by year, design, and context to answer RQ1. Second, thematic synthesis was used to answer RQ2 and RQ3. Findings were coded inductively, and the codes were grouped into four higher-order categories: influencer

attributes, mediating mechanisms, boundary conditions, and decision outcomes. These categories formed the basis of the integrative framework presented in the Results and Discussion. To reduce interpretive bias, each coded finding was traced back to the original abstract and results section, and claims were stated only at the level of detail reported by the source study.

RESULTS AND DISCUSSION

Characteristics of the reviewed studies (RQ1)

The 25 included studies show a field that is young but accelerating. One study was published in 2021, two in 2022, three in 2023, nine in 2024, seven in 2025, and three in the first ten months of 2026. Nearly two-thirds of the corpus therefore appeared from 2024 onward, mirroring the rapid commercial adoption of AI-generated personas. Table 1 lists the included studies and their principal findings, and Table 2 summarizes their research designs.

Table 1. Studies included in the review (n = 25)

No	Author (year)	Context / sample	Design	Main finding relevant to purchase decisions
1	Arsenyan & Mirowska (2021)	Instagram; one human, one human-like and one anime-like influencer over 11 months	Comparative case study	Audience reactions differ by influencer type; authenticity and social identity shape acceptance of virtual agents
2	Lou et al. (2022)	Social media users	Mixed methods	Consumers recognise virtual influencers as artificial yet still respond to their perceived authenticity
3	Sands et al. (2022)	Consumers exposed to AI vs human influencers	Scenario-based consumer study	Consumers engage with AI influencers, but trust and personal connection differ from human influencers
4	Zhou et al. (2023)	Multiple product categories	Multi-study experiments	Virtual influencers are less effective for products judged by touch, taste or smell
5	Gerlich (2023)	357 respondents	Survey	Virtual influencers perceived as trustworthy and credible, raising purchase intention
6	Sanchez-Alarcón et al. (2023)	Millennials; fashion and beauty	Survey	Digital influence is associated with millennials' purchasing decisions
7	J. Kim et al. (2024)	Virtual influencer followers	Survey	Playfulness and expertise build trust, which drives consumer behaviour
8	Garg & Bakshi (2024)	Beauty vlogger audiences, India	Survey (SEM)	Credibility attributes and parasocial interaction raise trust and purchase intention
9	Lee et al. (2024)	Virtual vs human influencers	Experiment	Virtual influencers seen as less authentic; machine heuristic moderates the gap
10	Davlembayeva et al. (2024)	Virtual influencer followers	Survey	Social influence processes explain behavioural responses to virtual influencers
11	Pan et al. (2024)	Anthropomorphic images	Experiments	Greater realism does not automatically raise purchase intention
12	Ferraro et al. (2024)	Diverse virtual personas	Experiments	Diversity cues in virtual influencers shape consumer evaluations

13	E. Kim et al. (2024)	Human-like vs anime-like influencers	Experiment	Human-like influencers earn more trust; anime-like ones offer more novelty
14	Mouritzen et al. (2024)	Influencer marketing landscape	Conceptual	Defines customisation, flexibility, ownership and automation; maps opportunities and risks
15	Belanche et al. (2024)	Human vs virtual influences	Comparative quantitative study	Human influencers retain advantages on several consumer responses
16	Cao et al. (2025)	Generation Z and millennials	Survey, multi-group analysis	Perceived value and source credibility drive engagement and purchase intention, with cohort differences
17	Jayasingh et al. (2025)	AI influencer followers	Survey (SEM)	AI influencer credibility increases engagement and purchase intention
18	Angmo et al. (2025)	Virtual influencer followers	Survey	Content and credibility jointly raise engagement and purchase intention
19	Barari et al. (2025)	Social media influencer studies	Meta-analysis	Influencer effects run through several mechanisms and vary with moderators
20	Wang et al. (2025)	Generation Z, China	Survey	Core virtual influencer characteristics shape purchase intention under dual moderation
21	Kembau et al. (2025a)	223 Instagram users aged 18–35, Indonesia	Survey, multi-group PLS-SEM	Useful virtual influencers spark stronger positive emotion than human ones
22	Kembau et al. (2025b)	235 Instagram users aged 18–35, Indonesia	Survey, PLS-SEM (AIDUA)	Positive emotion is the strongest driver of accepting virtual influencers
23	Liu et al. (2026)	Organic food consumers	Survey	Consumer engagement mediates the effect of virtual influencers on purchase intention
24	Yadav & Kumar (2026)	Human-like virtual influencers	Survey (SEM)	Engagement and emotional mechanisms link virtual influencers to purchase behaviour
25	Tuzzahro (2026)	Generation Z and millennials, Indonesia	Survey	Relatability, trust and authenticity raise purchase intention via emotional value and parasocial bonds

Table 2. Distribution of research designs

Research design	Number of studies	Share (%)
Quantitative survey (mostly SEM / PLS-SEM)	14	56
Experimental or scenario-based	7	28
Case study or mixed methods	2	8
Conceptual	1	4
Meta-analysis	1	4
Total	25	100

Two patterns stand out. Survey-based structural models dominate, which means the literature is strong at estimating associations among perceptions and intentions but weaker at establishing causality or observing actual purchases. Only one study in the corpus focuses solely on millennials (Sanchez-Alarcón et al., 2023), two compare millennials explicitly with Generation Z (Cao et al., 2025; Tuzzahro, 2026), and two Indonesian studies sample the 18–

35 age band that overlaps with younger millennials (Kembau et al., 2025a, 2025b). This confirms the cohort gap identified in the introduction.

Influencer attributes that drive effectiveness (RQ2)

The most consistent finding is that source credibility remains the gateway to persuasion, whether the source is human or virtual. Trustworthiness, expertise, and attractiveness of AI influencers raise consumer engagement and purchase intention (Jayasingh et al., 2025), and the same credibility attributes drive trust and purchase intention for human beauty vloggers (Garg & Bakshi, 2024). For virtual influencers, credibility is built partly through design. Playfulness and perceived expertise generate trust (J. Kim et al., 2024), and consumers may even rate virtual influencers as more credible and relevant than expected (Gerlich, 2023). Credibility is thus not an inherent property of being human; it is a perception that brands can engineer.

The second attribute is content. Informative, entertaining, and well-crafted content enhances engagement independently of who delivers it (Angmo et al., 2025), and perceived value, including functional and emotional value, explains why consumers engage with virtual influencer posts (Cao et al., 2025). Indonesian evidence sharpens this point: when followers judge an influencer genuinely useful, virtual influencers generate stronger positive emotion than human ones (Kembau et al., 2025a). This suggests a division of labour in which virtual influencers excel at delivering clear, utility-oriented information.

The third attribute is anthropomorphism, which works as a double-edged sword. Human-like virtual influencers inspire more trust, whereas stylised or anime-like ones attract attention through novelty (E. Kim et al., 2024). Yet greater realism is not always better; highly realistic images do not guarantee higher purchase intention (Pan et al., 2024), consistent with the unease that near-human agents can provoke (Arsenyan & Mirowska, 2021). Diversity cues add another layer, since consumers evaluate how a virtual persona represents identity and inclusion (Ferraro et al., 2024).

Mechanisms linking virtual influencers to purchase decisions (RQ2)

Across the corpus, virtual influencers rarely affect purchase decisions directly. Their influence travels through three mediating mechanisms. The first is consumer engagement. Engagement mediates the link between virtual influencers and purchase intention in general product contexts (Jayasingh et al., 2025; Angmo et al., 2025) and in specialised categories such as organic food (Liu et al., 2026). The second is emotion. Positive emotion emerged as the strongest predictor of willingness to accept virtual influencers among young Indonesians (Kembau et al., 2025b), and emotional mechanisms translate exposure to human-like virtual influencers into purchase behaviour (Yadav & Kumar, 2026). The third is the parasocial relationship, the one-sided sense of intimacy followers develop with a persona. Parasocial interaction strengthens trust and purchase intention (Garg & Bakshi, 2024), carries the effect of relatability and authenticity on purchase intention (Tuzzahro, 2026), and amplifies positive feelings toward both human and virtual influencers (Kembau et al., 2025a).

Social influence theory offers a useful umbrella for these mechanisms. Consumers may comply with, identify with, or internalise the messages of a virtual influencer, and these processes shape their behavioural responses (Davlembayeva et al., 2024). The meta-analytic evidence similarly shows that influencer effects run through multiple parallel routes rather than a single pathway (Barari et al., 2025). For purchase decisions, this implies that virtual influencers act mainly at the early and middle stages of the decision process: they stimulate need recognition, supply information during search, and shape evaluation of alternatives through trust and emotion.

Boundary conditions (RQ3)

Four boundary conditions limit virtual influencer effectiveness. The first is perceived authenticity. Consumers know that virtual influencers are artificial and tend to judge them as less authentic than humans (Lee et al., 2024), although many still respond to a constructed, "authentically fake" persona (Lou et al., 2022). The second is product type. Because virtual influencers cannot physically experience products, they are less persuasive

for goods whose value depends on touch, taste, or smell (Zhou et al., 2023). The third is consumer cognition: individuals who believe machines are objective show a smaller authenticity penalty (Lee et al., 2024). The fourth is relational depth. Human influencers keep advantages on several consumer outcomes (Belanche et al., 2024), and differences in trust and personal connection persist even when consumers are willing to follow AI influencers (Sands et al., 2022). In Indonesia, human influencers are also forgiven more readily when content falls short, whereas virtual influencers are judged more strictly on utility (Kembau et al., 2025a). Ethical risks, such as undisclosed artificiality and unrealistic standards, further constrain long-term effectiveness (Mouritzen et al., 2024).

The millennial lens

The limited cohort-specific evidence nonetheless points to a distinct millennial profile. Millennials respond to digital influence in categories where visual presentation matters (Sanchez-Alarcón et al., 2023), and the routes from perceived value and credibility to engagement differ between millennials and Generation Z (Cao et al., 2025). Compared with Generation Z, for whom novelty and playful design carry more weight (Wang et al., 2025; E. Kim et al., 2024), millennials appear to reward utility, expertise, and relatability. Indonesian findings that utility-based judgements and positive emotion dominate acceptance among 18–35-year-olds (Kembau et al., 2025a, 2025b), together with evidence that relatability and authenticity drive purchase intention in both cohorts (Tuzzahro, 2026), support this reading. For millennials, therefore, a virtual influencer is effective when it behaves like a knowledgeable, consistent, and transparent advisor rather than a novelty act.

An integrative Credibility–Engagement–Decision framework

Synthesising these findings, Table 3 presents the Credibility–Engagement–Decision (CED) framework, which links virtual influencer attributes to millennial purchase decisions through mediating mechanisms and boundary conditions.

Table 3. The Credibility–Engagement–Decision (CED) framework

Component	Elements	Supporting studies	Implication for millennial purchase decisions
Influencer attributes	Credibility (trust, expertise, attractiveness); content value; calibrated anthropomorphism; diversity cues	Jayasingh et al. (2025); Angmo et al. (2025); E. Kim et al. (2024); Pan et al. (2024); Ferraro et al. (2024)	Triggers need and attention
Mediating mechanisms	Consumer engagement; positive emotion; parasocial relationship; social influence processes	Liu et al. (2026); Kembau et al. (2025b); Tuzzahro (2026); Davlembayeva et al. (2024)	Shapes information search and evaluation of alternatives
Boundary conditions	Perceived authenticity; product sensory type; machine heuristic; relational depth; disclosure ethics	Lee et al. (2024); Zhou et al. (2023); Belanche et al. (2024); Mouritzen et al. (2024)	Strengthens or weakens the conversion from intention to choice
Decision outcomes	Purchase intention; purchase decision; acceptance and loyalty	Gerlich (2023); Cao et al. (2025); Yadav & Kumar (2026)	Final choice and post-purchase evaluation

The framework carries three practical implications. Brands targeting millennials should prioritise credibility and useful content over spectacle, assigning virtual influencers to product categories that are evaluated visually or functionally, such as fashion, technology, and digital services. Campaigns should openly disclose the artificial nature of the persona, since transparency protects the authenticity on which millennial trust depends. Finally, a hybrid strategy appears most promising: virtual influencers deliver consistent, data-rich

recommendations, while human influencers supply lived experience and emotional depth, particularly for sensory products. Theoretically, the framework moves the debate from a binary comparison of human versus virtual endorsers toward a conditional model in which effectiveness depends on attribute fit, mediating mechanisms, and cohort characteristics.

CONCLUSIONS

This systematic review of 25 studies published between 2021 and 2026 concludes that marketing through virtual influencers can be effective in shaping millennial consumers' purchase decisions, but its effectiveness is conditional rather than automatic. Virtual influencers persuade when they are perceived as credible, when their content delivers clear functional and emotional value, and when their degree of human likeness is calibrated rather than maximised. Their influence on purchase decisions is mostly indirect, flowing through consumer engagement, positive emotion, parasocial relationships, and social influence processes. Effectiveness weakens when consumers perceive the persona as inauthentic, when the product depends on sensory experience, and when the relationship requires the depth and forgiveness that human creators still command.

For millennials specifically, the evidence suggests that utility, expertise, relatability, and transparency matter more than novelty. The proposed Credibility–Engagement–Decision framework integrates these findings and maps them onto the stages of the consumer decision process, offering a basis for both future research and campaign design. For brands in Indonesia and similar mobile-first markets, the practical message is to use virtual influencers as transparent, knowledge-rich advisors for visually or functionally evaluated products, and to combine them with human influencers for categories that depend on lived experience.

This review has limitations. It relied on two search platforms and a modest corpus, and most included studies measured purchase intention rather than actual purchases. Future research should isolate millennials as a distinct cohort, use longitudinal designs and behavioural or transaction data to observe real purchase decisions, test the CED framework empirically through structural modelling, and examine how disclosure regulations on AI-generated personas affect millennial trust and buying behaviour.

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