

Virtual Influencer Marketing: Examining the Impact of Perceived Authenticity and Source Attractiveness on Brand Trust with Digital Literacy as a Moderator

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ABSTRACT

The marketing landscape is witnessing a strategic shift from human to AI-powered virtual influencers (VIs). While their use is growing, their impact on brand trust remains unclear, especially concerning key attributes like perceived authenticity and source attractiveness, and how these are filtered by consumers' digital literacy. This quantitative study employed an online survey to collect data from 153 Indonesian social media users from Generations Y and Z who were actively exposed to VI content. Data were analysed using Structural Equation Modelling (SEM) with Partial Least Squares (PLS) to test hypotheses regarding the influence of perceived authenticity and source attractiveness on brand trust, with digital literacy as a moderating variable. The results confirmed that both perceived authenticity ($\beta = 0.612$, $p < 0.001$) and source attractiveness ($\beta = 0.328$, $p < 0.001$) have a significant positive effect on brand trust. Furthermore, digital literacy was found to be a significant, albeit weaker, moderating factor in this relationship ($\beta = 0.167$, $p = 0.015$), indicating that a consumer's level of digital sophistication influences how they process VI's attributes to form brand trust. The study concludes that the effectiveness of VIs is not universal but is critically dependent on the audience's level of digital literacy. For theorists, this study extends models like the Elaboration Likelihood Model by validating their application to non-human entities. For managers, the findings underscore the need to prioritize authentic narrative-building and strategic VI alignment with brand identity.

Keywords: Virtual Influencer; Social Media; Digital Literacy



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INTRODUCTION

The dominance of social media platforms in contemporary marketing has given rise to a new paradigm in which digital public figures, or influencers, have become key actors in shaping consumer opinions and behavior. However, this ecosystem is not without its challenges, such as controversy, image consistency, and the inherent human limitations of conventional influencers. In response to these dynamics, the industry has begun to shift towards more controllable and sustainable solutions, namely the use of virtual characters created entirely using computer graphics and AI technology. The shift from reliance on human influencers to these designed digital entities marks a strategic evolution in branding and marketing communication strategies, offering narrative precision and immunity to the reputational risks often associated with human figures (Kotler & Keller, 2016).

The two-step flow of communication theory states that instead of being directly impacted by the media, individuals will get influence through interpersonal communication conveyed by an opinion leader (Littlejohn *et al.*, 2016:157). In the digital era, buzzers, influencers, and endorsers are frequently linked to the idea of opinion leaders (Yuanita, 2021). It should be mentioned that human influences occasionally display prejudice and irrationality. On the other hand, marketers have more control and authority over sponsored content since virtual influencers are subject to algorithms that may be customized to meet their demands (Gerlich, 2023). The detachment of virtual influencers from physical reality allows for the development of narratives and characters that are fully integrated with the fantasy world of the products they promote, thereby increasing the hedonistic appeal for consumers (Sokolova & Kefi, 2020). Thus, when virtual influencers endorse a brand, customers will associate that brand with it, which will help to create a more favorable brand impression (Thomas & Fowler, 2021). Over the past three to four years, various brands from every industry have collaborated with virtual influencers and demonstrated their commitment to this innovation and creativity, such as Renault, IKEA, Prada, and Samsung (Nguyen *et al.*, 2021).

In Indonesia, spending on influencer marketing is projected to grow rapidly, reaching USD 248 million by 2025, with an increasingly significant portion allocated to virtual influencers (Ross, 2024). This trend is driven by key demographic characteristics, with Gen Z (born 1997-2012) showing higher levels of acceptance and engagement compared to Millennials (born 1981-1996). A survey by Ross (2024) revealed that 68% of Gen Z respondents in Indonesia expressed interest in content presented by virtual influencers, while the figure for Millennials was only 45%. The advantage of Gen Z is related to their nature as true digital natives who have been familiar with avatars and the virtual world since childhood, as well as the added value they see in terms of unlimited creativity, character consistency, and novelty offered by these digital entities. Therefore, understanding the perceptions and determining factors of the effectiveness of virtual influencers, especially among Indonesian Gen Z, is crucial for the success of future digital marketing strategies. Scholarly investigations of virtual influences are still in their infancy. Because human-like virtual influencers that produce material for social media are still relatively new, it is insufficient. It's unclear if the communication principles that govern social media influencers also apply to virtual influencers who resemble real people (Xie-Carson *et al.*, 2024). This gap in the literature suggests that more study is desperately needed ((Chloe) Ki *et al.*, 2022).

Since the development of human-like virtual influencers producing material on social media is still relatively new, academic research on virtual influencers is still in its infancy and is lacking. It's unclear if the communication principles that govern social media influencers also apply to virtual influencers who resemble real people (Xie-Carson

et al., 2024). This gap in the literature suggests that more study is desperately needed. Using consumer digital literacy as a moderating variable, this study expands on earlier research by examining the impact of virtual influencers on brand trust while accounting for factors like authenticity and source attractiveness. While earlier research has examined virtual influencers in a global context Schwemmer & Ziewiecki (2018) and Djafarova & Trofimenko (2019), this study focuses on the Indonesian consumer context by examining how virtual influencer attributes, like perceived authenticity and source attractiveness, affect consumer trust in a brand. The moderating effect of digital literacy in metropolitan regions with greater levels of technology-related knowledge will also be investigated in this study.

LITERATURE REVIEW

Brand Trust

In the context of this study, brand trust refers to customers' confidence in a brand's capacity to deliver on its promises in a particular circumstance. Brand trust is essential for fostering long-term usage and purchase loyalty as well as customer loyalty, according to Chaudhuri & Holbrook (2001). The theoretical underpinnings of brand trust are deeply rooted in relationship marketing theory, which applies principles of interpersonal relationships to the context of brands and consumers (Morgan & Hunt, 1994). According to this view, trust is a key mediating variable that fosters commitment, reduces uncertainty, and encourages cooperation within a relationship. When consumers trust a brand, they are more inclined to spend more, become devoted supporters, and overlook sporadic errors.

The development of brand trust is not instantaneous but is a cumulative process shaped by consistent positive experiences, transparent communication, and the brand's adherence to its core values over time (Munandar & Efawati, 2020). In today's digital marketplace, where information is abundant and skepticism is high, establishing and maintaining brand trust has become even more critical, serving as a significant competitive advantage that directly influences purchase decisions, brand loyalty, and overall firm performance (Chaniago & Efawati, 2022). Building long-lasting connections with customers requires trust, which is generally considered to be an essential part of every brand. Experts in the field of brand research typically examine how consumers' psychology shapes brand trust (Ling *et al.*, 2023). Amyx *et al.* (2016) discovered that customers' opinions of the brand are what lead to the development of brand trust. Customers will thus have a high level of brand trust when they believe the brand to be trustworthy and safe.

Influencer Virtual

A new paradigm within the digital sphere has emerged due to artificial intelligence's (AI) improvement, and the use of AI-based totally digital influencers on social media systems has revolutionized digital advertising strategies. This phenomenon represents a strategic shift within the idea of client engagement, wherein the authority and influence formerly ruled via traditional human influencers is starting to get replaced by using algorithmically generated virtual personas. This alteration not best demands situations the conventions of authenticity and agree with but also opens up new dimensions in content personalization and branding marketing campaign scalability.

Huang and Rust (2021, p. 31) conceptualize AI as the use of computational machinery to emulate skills inherent in humans, which includes doing bodily or

mechanical obligations, questioning, and feeling, which take the form both truly or as robots. The interactions with robots and AI in people's everyday lives are growing, and emotions closer to robots play a massive function inside the willingness to interact with them (Smith, Sherrin, Fraune & Šabanović 2020). Panjraht and Tiwari (2021) argue that AI-powered VIs has the ability to reduce human's tension that otherwise ought to arise with human influencers. As visible throughout the literature review and theoretical framework, the modern-day research indicates contradictory results. This could be because of the truth that Vis, as an advertising and marketing tool, is a brand new phenomenon and have not but been very well examined. People generally tend to ascribe human attributes and characteristics, both psychological and bodily, to robots while being exposed to them in the market, which is the phenomenon of Anthropomorphism (Kim, Schmitt & Thalmann 2019). But, Kim, Schmitt, and Thalmann (2019) located that once humans face an anthropomorphized robotic. That is, the more warm the temperature the robot portrays, the greater the terrible attitudes humans get, which sounds contradictory. That is due to the phenomenon of the Uncanny Valley theory, a feeling of unease for the robotic or artificial entity while it gets too near human beings in its appearance and fictional personal traits.

According to research by Thomas & Fowler (2021), virtual influencers are considered more controllable than actual humans due to the fact they may be now not laid low with scandals or non-public issues, thereby lowering reputational hazard for manufactures. Zhong's (2022) research suggests that there's a correlation among virtual influencers and logos agree with. Virtual influencer endorsement commercials on social media, those with greater interactions can encourage extrinsic motivations, even as the content material of the commercial can encourage intrinsic motivations via gratifying the target audience's wishes for love and belongingness, cognitive and self-actualization. But, research carried out by using Madinga *et al.* (2024) suggest that there may be no tremendous impact among digital influencers and logos agree with. This study determined that despite the fact that digital influencers are considered attractive and futuristic, they always score in terms of authenticity and perceived honesty in comparison to human influencers.

Perceive Authenticity

The perception of authenticity is a crucial element in assessing virtual influencers' efficacy. Unlike human influencers, whose authenticity is built on life experiences, the authenticity of virtual influencers is algorithmically curated. Previous research has shown that, despite being artificial, virtual influencers can evoke perceptions of authenticity when they display human traits, such as relatable narratives and consistent personalities (Thomas & Fowler, 2021). According to the authenticity management framework (Audrezet *et al.*, 2020), an influencer's perception of authenticity can be shaped by providing honest disclosures about partnerships with brands and expressing honest opinions about products. This framework further highlights the importance for influencers to convey the behind-the-scenes efforts they undertake, such as how thoroughly they evaluate a product before recommending it, as well as acknowledge partnerships (Audrezet *et al.*, 2020).

However, compared to human influencers, VIs often face skepticism due to their lack of authentic life experiences, which can hinder emotional connection (Sundar & Kim, 2019). Research by Lou *et al.* (2023) demonstrates that perceived authenticity in VIs is multidimensional, encompassing both attribution authenticity (transparency regarding their artificial nature) and moral authenticity (alignment with ethical values). Interestingly, when brands strategically reveal the non-human identity of VIs, this can

increase trust (Westerman *et al.*, 2014). However, conflicting findings also exist, as some consumers continue to reject VIs, perceiving them as manipulative (A. J. Kim & Ko, 2010). The extant literature on consumer responses to highly artificial personas is equivocal; however, there is a demonstrable body of evidence indicating that sensible and high-quality virtual influencers can enhance engagement (Kim *et al.*, 2024). However, research conducted by Erdogan (2020) states that virtual influencers (who are often considered less authentic and less credible) have difficulty influencing brand trust. If the mediator stage is weak, then the final impact on brand trust and loyalty will also be weak. For consumers who are already very skeptical about influencer marketing practices as a whole, an increase in perceived authenticity is not strong enough to build brand trust.

H1: The perceived authenticity of virtual influencers has a positive and significant effect on brand trust.

Source Attractiveness

The idea of source attractiveness is a key pillar of persuasion and advertising and marketing communicate ideas. This concept was popularized by Petty & Cacioppo (1986) and further developed by marketing experts such as Solomon, Engel, Blackwell, and Miniard. Source attractiveness refers to the extent to which a communicator (in this case, an influencer) is perceived to possess qualities that make them appealing to the audience, which can then enhance the effectiveness of their persuasive message (Lou & Yuan, 2019). Petty & Cacioppo (1986), created the Elaboration Likelihood Model (ELM), which offers a fundamental framework for comprehending the 2 paths of persuasion. The ELM's fundamental tenet is that there are two one of a kind methods to alter one's mindset: the important route and the outer edge course. The primary direction involves both motivation and processing talents and involves someone's careful and cautious assessment of the real qualities of the records furnished in a conversation. However, without closely inspecting the communicate's actual substance, the peripheral technique includes converting attitudes by way of associating the message with either high-quality or bad cues within the persuading putting. It is within this peripheral route that the construct of source attractiveness finds its primary theoretical grounding. Source attractiveness, encompassing physical attractiveness, likability, and similarity to the audience, functions as a powerful peripheral cue. Within the current digital and social media marketing landscape, this hypothesis has been expanded to include influencers, where their perceived attractiveness and charisma serve as key peripheral cues that can trigger positive brand associations and foster brand trust, especially when the audience is not deeply engaged with the product category. Thus, the ELM positions source attractiveness not as a universally dominant force, but as a potent persuasive tool whose impact is contingent upon the receiver's level of elaboration, effectively explaining when and why an attractive source can significantly influence consumer decision-making.

The Heuristic-Systematic Model states that while assessing a message, consumers frequently employ mental shortcuts, or heuristics. The elegance of an influencer is a straightforward yet powerful heuristic cue. Followers' self-assurance in sponsored content is undoubtedly by way of an influencer's informative cost, beauty, resemblance to fans, and dependability, which eventually increases brand recognition and purchase (Lou & Yuan, 2019). However, have a look by using D. Y. Kim & Kim (2021) demonstrates that the improvement of relational consideration is not drastically impacted by an influencer's beauty. According to research by Lee & Lim (2022), found that the attractiveness of the virtual influencer had a direct and positive effect on brand trust. This means that when consumers perceived the virtual influencer as physically and socially attractive, their trust

in the brand being promoted increased significantly. However, research conducted by Kim, J., & Lee, S. (2022) reveals that for virtual influencers, attractiveness has only a small and indirect effect on brand trust. The factors of authenticity and expertise are far more decisive in building trust.

H2: The source attractiveness of virtual influencers has a positive and significant effect on brand trust

Digital Literacy

Gilster (1998) defines the capacity to comprehend and utilize information from a variety of computer-based sources is known as digital literacy. This involves the capacity to use photos in addition to the basic skills of using software and digital equipment, reproduce and disseminate information, provide information, and develop social-emotional competencies. A digitally literate individual must have operational and technical skills, demonstrate critical thinking and the ability to evaluate digital content, and use the web safely for professional, educational, and other routine activities.

Social media literacy comprises three core dimensions: technical skills, critical evaluation skills, and communicative competence (Livingstone *et al.*, 2011). Technical skills encompass platform navigation and content creation abilities, while critical evaluation involves assessing the credibility of information and recognizing potential biases (Jones-Jang *et al.*, 2021). Specifically, communicative competence includes the ethical use of social media, including awareness of digital footprints and responsible sharing practices (Pangrazio & Sefton-Green, 2022). Research carried out through Septyanto *et al.* (2023) shows that virtual literacy strengthens the influence of brand image on logos agree with. Customers with high digital literacy and a very good brand image are more powerful in constructing brand trust. However, in step with Hajli *et al.* (2017), digital literacy has a vulnerable or inconsistent moderating effect on the relationship among perceived social support and buy intention in the context of social trade.

H3: Digital literacy has a moderates impact the relationship between perceived authenticity and source attractiveness in the direction of brand trust

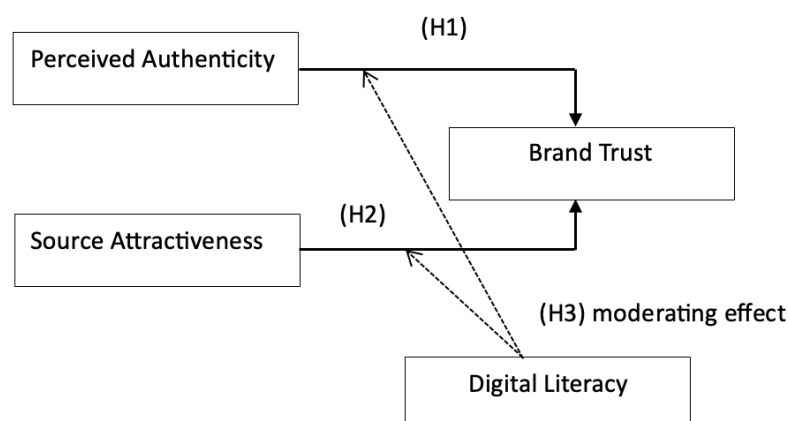


Figure 1. Model of Research
Source: Own Compilation, 2025

RESEARCH METHOD

Generation Z (born 1997–2012) and Generation Y (Millennials born 1981–1996), who had each been uncovered to digital influencers on social media, had been the respondents selected by means of purposive sampling. Some questions on age, gender, occupation, social media utilization, platform choices, exposure to digital influencers, and frequency of engagement with them were used to collect the respondents demographic profiles. Researchers were better able to comprehend the respondents' characteristics thanks to this knowledge, which also gave context for how this group engages with virtual influencer content.

In order to evaluate hypotheses on the effect of the links among authenticity perception, source attractiveness, brand trust, and digital literacy, this study used a quantitative technique, a research strategy that places a high priority on numerical data (numbers) and statistical analysis. Data collection was conducted via a survey.

This study utilizes a quantitative study technique with Structural Equation Modelling (SEM) the use of Smart PLS to examine the outcomes of virtual influencers on customer brand trust. Partial Least Square (PLS) is an analysis method that is not based on assumptions of measurement scale, data distribution, and sample size (Ghozali, 2008). Wold in Ghozali (2008) states that PLS is an effective analysis technique as it is not based on many assumptions. In addition, PLS can measure variable relationships in the shape of formative relationships, which cannot be measured by SEM. PLS can also be used for prediction and to confirm theories in addition to explaining the existence or absence of relationships between latent variables. Based on the above explanation, Table 1 presents the questionnaire data for respondents.

Table 1. Variable question

Indicator	Sub Variable	Question
PA 1	Virtual influencers appear lifelike and natural in conveying a message	The virtual influencer's way of delivering messages feels lifelike and natural
PA 2	Virtual influencers display realistic emotions	How much do you agree that the emotions shown by virtual influencers appear genuine and realistic?
PA 3	Virtual influencers can create emotional closeness with their audience	When following virtual influencers, I feel a sense of personal connection and emotional closeness.
SA 1	Virtual influencers have an impact on purchasing preferences on social media	The recommendations from virtual influencers can influence my buying decisions on social media.
SA 2	Virtual influencers share similar interest and value with consumers	I feel that virtual influencers share similar interests and values with me.
SA 3	Virtual influencers have an attractive communication style and appearance	I found the virtual influencer's communication style and visual appearance to be appealing.
BT 1	Trust in virtual influencers increases trust in brand	My trust in virtual influencers makes me more likely to trust the brands they promote.
BT 2	Credibility influences perceptions of credibility	I perceive a brand as more credible when it is endorsed by a virtual influencer I find credible.
BT 3	Virtual influencers recommendations are considered trustworthy	I consider the product or brand recommendations from virtual influencers to be trustworthy.

DL 1	Consumers can distinguish among virtual influencers and human influencers on social media	I will easily tell the difference between virtual influencers and human influencers on social media.
DL 2	Consumers realize that virtual influencers may be motivated by commercial interest	I understand that posts by virtual influencers are usually created for commercial purposes and brand promotion.
DL 3	Consumers understand that collaborating with virtual influencers is a part form of marketing.	I recognize that when a brand collaborates with a virtual influencer, it is a strategic marketing tactic.

Source: Own compilation (2025)

According to Suhardi (2023), the operational definition of a variable is an explanation of how a variable will be measured in a study. The aim is to show how a concept is measured or operationalized so that it can be studied or measured empirically. Table 2 shows the operational definitions of the variables used in this research.

Table 2. Operational definitions variable

Variable	Indicator	Sub Variable
Perceived Authenticity (Belanche <i>et al.</i> , 2021; Sung <i>et al.</i> , 2021)	PA 1	Virtual influencers appear lifelike and natural in conveying a message
	PA 2	Virtual influencers display realistic emotions
	PA 3	Virtual influencers can create emotional closeness with their audience
Source Attractiveness (Schouten <i>et al.</i> , 2020; Sokolova & Kefi, 2020)	SA 1	Virtual influencers have an impact on purchasing preferences on social media
	SA 2	Virtual influencers share similar interest and value with consumers
	SA 3	Virtual influencers have an attractive communication style and appearance
Brand Trust (Torres <i>et al.</i> , 2019)	BT 1	Trust in virtual influencers increases trust in brand
	BT 2	Credibility influences perceptions of credibility
	BT 3	Virtual influencers recommendations are considered trustworthy
Digital Literacy (Chuah & Kabilan, 2021; Nguyen <i>et al.</i> , 2021)	DL 1	Consumers can distinguish between virtual influencers and human influencers on social media
	DL 2	Consumers realize that virtual influencers may be motivated by commercial interest
	DL 3	Consumers understand that collaborating with virtual influencers is a part form of marketing.

Source: Own compilation (2025)

Respondents filled out questionnaires with the Likert scale, which served as the study's measuring instrument. Five points, from 1 (strongly disagree) to 5 (strongly agree), were utilized in the Likert scale evaluation. Data preparation (5-point Likert scale) and theoretical model creation based on hypotheses were the first steps in the PLS-SEM analysis. Convergent validity testing (factor loadings > 0.7, AVE > 0.5) and reliability testing (composite reliability > 0.7) were then used to evaluate the model. Furthermore, the bootstrapping approach was used to test the structural model in order to assess the predictive capacity (R²), path coefficient significance (p-value < 0.05), and predictive relevance (Q² > 0), followed by mediation analysis of consumer behavior variables, and reporting of results in the form of path coefficients, t-values, and effect sizes (f²) to answer the research questions.

RESEARCH RESULTS

This study involved 153 respondents who completed a questionnaire, with their active exposure to virtual influencer material on social media being the main trait. Generally speaking, 72% of the respondents were young consumers from Generation Z (ages 18 to 24), who made up the sample. This suggests that youthful audiences are pretty engaged with digital material, especially virtual influencers. The gender distribution additionally found out a choice for female responses (62%), with students making up the largest occupational category (42%).

The concentration of young respondents, predominantly female, shows that this group responds very well to digital marketing tactics that use virtual influencers, highlighting the significance of adjusting material to the tastes and actions of the audience. Data on how people use social media is shown in Table 3. A high degree of digital involvement is demonstrated by the fact that most respondents (47%) spend three to five hours a day on social media. This pattern demonstrates how virtual influencers are increasingly influencing consumer choices, particularly among youthful audiences who are engaged on the internet. In Indonesia, Instagram is the most popular site for connecting with virtual influencers, according to 57% of respondents, further solidifying its position as a crucial digital marketing avenue.

Table 3. Descriptive analysis result

Respondent's Characteristic	Category	Frequency (n=153)	Percentage (%)
Age Category	Gen Z (18-24 years)	110	72%
	Gen Y (25-40 years)	43	28%
Gender	Male	58	38%
	Female	95	62%
Job	Student	64	42%
	Full-Time Employee	46	30%
	Part-Time Employee	43	28%
Social Media Usage/Day	1-3 hours/day	31	20%
	3-5 hours/day	72	47%
	More than 5 hours/day	50	33%
The Most Interested Platform	TikTok	31	20%
	YouTube	18	12%
	X	9	6%
	Instagram	87	57%
	Facebook	8	5%

Source: Own compilation (2025)

To make certain the research tools satisfy the requirements for unique and reliable measurement, validity and reliability tests have been carried out. Factor loadings > 0.7 ($p < 0.05$) and Average Variance Extracted (AVE) > 0.5 have been used to assess convergent validity, showing that the signs appropriately mediated the concept (Hair *et al.*, 2017).

If each construct's rectangular root of the AVE is higher than the inter-construct correlation, discriminant validity is glad (Fornell & Larcker, 1981). Internal consistency became indicated by using reliability testing with Composite Reliability (CR) > 0.7 and Cronbach's Alpha > 0.7 (Bagozzi & Yi, 1988). Table 4 displays the findings from the validity and reliability tests.

Table 4. Validity and reliability result

	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Source Attractiveness	0.866	0.866	0.924	0.804
Literacy Digital	0.913	0.915	0.938	0.851
Perceived Authenticity	0.911	0.911	0.933	0.856
Brand Trust	0.875	0.876	0.929	0.806

Source: PLS Result Compilation (2025)

Adequate convergent validity is proven with the aid of the AVE values, which display the share of variance defined through each concept, above the cautioned cutoff of 0.50 (Fornell & Larcker, 1981). Moreover, all Composite Reliability values are greater than 0.70, which reinforces the sign's constant assessment of every latent variable and suggests good internal consistency (Bagozzi & Yi, 1988). Overall, the constructs employed in this study are more accurate and reliable thanks to the matrix shown in Table 4, which also offers a strong basis for additional investigation.

According to the findings of hypothesis testing, consumers' brand trust driven by virtual influencers is significantly impacted by the factors perceived authenticity, source attractiveness, and digital literacy (Table 5). With a noticeably substantial T value of 7.442 and a P value of 0.000, the Perceived Authenticity variable has a positive impact of 0.612. Consistent with this study, customers are a ways more likely to agree with a commercial enterprise after they consider virtual influencers to be real and applicable. This emphasizes how crucial authenticity is in fostering audience engagement.

With a direct effect of 0.328 (T-value = 4.356, P-value = 0.000), the findings of assessing the variable source attractiveness produced by virtual influencers demonstrate a favorable and substantial impact on customer confidence in buying a brand. Brands should prioritize high-quality digital content since these studies show that innovative, visually attractive, and well-designed material greatly enhances audience engagement and brand trust.

Table 5. Hypothesis test result

Hypothesis	Relationship	Direct Effect	Total Effect	T-Value	P-Value	Result
H1	Perceived Authenticity → Brand Trust	0.612	0.612	7.442	0.000	Supported
H2	Source Attractiveness → Brand Trust	0.328	0.328	4.356	0.000	Supported
H3	Digital literacy moderates the relationship between perceptions authenticity and source attractiveness on brand trust	0.167	0.167	2.507	0.015	Supported

Source: PLS Result Compilation (2025)

The combination of Digital Literacy and Technological Capability shows an effect size of 0.167 (T value = 2.507, P value = 0.015). This occurs because data-literate consumers tend to be better able to understand the value exchange behind their data collection, and can appreciate the relevance and convenience offered by personalized advertising (Martin & Murphy, 2017). Conversely, for consumers with low data literacy, this personalization practice can actually be perceived as intrusive. Customers' concern about privacy yet continued sharing of their data is known as the "privacy paradox," and it is frequently made worse by their ignorance of the ways in which their data is gathered, utilized, and sold (Acquisti *et al.*, 2015). Without the competence to analyze privacy

policies, manage application permissions, and understand digital footprints, users become highly vulnerable to privacy violations, persuasive manipulation, and data exploitation by digital platforms (Zuboff, 2019).

DISCUSSION

Perceived Authenticity on Brand Trust

The study's findings suggest that consumer brand trust is positively and significantly impacted by the authenticity perception variable. This finding is consistent with other research that highlights that in order to attain the best outcomes, marketing strategies involving virtual influencers must be consistent with the influencer's life story and appear natural (Casaló *et al.*, 2020). Research findings consistently demonstrate that perceived authenticity in virtual influencers significantly enhances consumer brand trust, as these digital personas, despite being computer-generated, can cultivate genuine-seeming relationships and transparent communication. When consumers perceive a virtual influencer as authentic, believing their endorsements are sincere, their personality is consistent, and their narrative is relatable. It mitigates the inherent "artificial" barrier. It fosters a sense of reliability and integrity. This established trust is then transferred to the associated brand, making consumers more confident in the brand's promises and more willing to engage in a transactional relationship, ultimately proving that perceived authenticity is a powerful and significant driver of brand trust in the digital marketing landscape.

Authenticity benefits virtual influencers, according to study by Alimamy & Kuhail (2023), authenticity has a positive impact on virtual influencers. Customers' intentions to buy can be directly impacted by the authenticity and trustworthiness that have been established (J.H. Kim & Song, 2020). Marketing theories like the self-determination hypothesis contend that when consumers believe an influencer's material reflects genuine expression and intrinsic motivation rather than promotion motivated by extrinsic incentive, they are more inclined to interact with the influencer (Deci & Ryan, 1985).

Source Attractiveness on Brand Trust

The findings indicate that brand trust is positively and significantly impacted by the source attractiveness attribute. This result aligns with the hypothesis of the Source Attractiveness Model put out by the findings indicate that brand trust is positively and significantly impacted by the source attractiveness attribute. This result aligns with the hypothesis of the Source Attractiveness Model put forward by McGuire (1985), which states that the credibility of a message source is built not only by expertise but also by attractiveness. This attractiveness includes similarity, familiarity, and physical and non-physical likability possessed by the source. When consumers perceive a brand as being associated with an attractive source, they tend to project these positive traits onto the brand, thereby building the perception that the brand is more trustworthy, authentic, and congruent with their self-values (self-congruity theory). Therefore, the positive influence of source attractiveness on brand trust can be explained through the heuristic periphery mechanism in the Elaboration Likelihood Model (Petty *et al.*, 1997). This concept, rooted in the "halo effect" suggests that a virtual influencer's perceived physical appeal, likability, and stylishness make them more persuasive and appealing to their audience. Consumers are naturally drawn to aesthetically pleasing and charismatic figures, even digital ones, and this positive perception transfers to the brands they endorse. When a

virtual influencer is seen as attractive, they are viewed as more credible and their recommendations are considered more valuable, thereby fostering a sense of reliability and confidence in the brand they are promoting, which directly strengthens the consumer's trust in that brand. Consequently, the strategic deployment of an attractive virtual influencer serves as a critical antecedent in the consumer's psychological process of developing trust in the associated brand, mitigating the inherent skepticism towards non-human endorsers.

Digital Literacy as a Moderating Variable

Digital literacy is a crucial factor and critical variable in understanding the relationship between perceptions of authenticity and source attractiveness on consumer brand trust. This is particularly relevant in diverse and dynamic digital markets such as Indonesia. The findings reveal that digital literacy contributes to enhancing consumers' ability to analyze virtual influencers as part of a brand's social media marketing strategy. The consistency of these findings with the results of studies by Chuah & Kabilan (2021) and Belanche *et al.* (2021) reinforces the proposition that digital competence is an important prerequisite for consumers in navigating interactions with complex digital elements. Previous studies also underscore the role of digital literacy as a crucial moderating variable, particularly in the context of young demographic groups that are inherently digitally skilled, such as Generation Z and Millennials (Generation Y).

The findings indicate that for individuals with high digital literacy, the positive impact of both perceived authenticity and attractiveness on brand trust is substantially attenuated. These consumers possess a more sophisticated and critical understanding of digital marketing constructs, leading them to deconstruct the curated nature of the virtual influencer's persona and endorsements, thereby mitigating the persuasive power of these surface level cues. Conversely, for consumers with lower digital literacy, the influence of perceived authenticity and attractiveness on brand trust is significantly greater, as they are less likely to critically evaluate the commercial and artificial origins of the influencer, leading to a more direct, less scrutinized transfer of trust. This underscores that the efficacy of virtual influencer marketing is not universal but critically depends on the audience's level of digital sophistication.

CONCLUSIONS

This study makes several significant contributions to the theoretical understanding of virtual influencer marketing and its impact on consumer behaviour. First, it extends the Source Attractiveness Model and the Elaboration Likelihood Model (ELM) by empirically validating that peripheral cues, such as the aesthetic appeal and likability of a non-human entity, remain potent drivers of brand trust in the digital realm. This confirms that the heuristic processing of attractiveness is not limited to human sources and can be effectively leveraged by algorithmically created personas.

Second, the research deepens the discourse on perceived authenticity in human-computer interaction. It demonstrates that for virtual influencers, authenticity is not an inherent trait but a perceived quality constructed through lifelike communication, realistic emotions, and the ability to foster emotional closeness. This finding bridges the gap between traditional authenticity literature and the emerging context of synthetic media, showing that the paradox of manufactured authenticity can be a viable pathway to building brand trust. Most importantly, this study introduces a crucial nuance by identifying digital literacy as a key moderating variable. The findings reveal that the effectiveness of virtual influencers is not universal but is critically dependent on the

audience's level of digital sophistication. This contributes to a more granular theoretical model, suggesting that the established pathways from influencer attributes to brand trust are not linear but are filtered through the consumer's critical evaluation skills. This positions digital literacy not merely as a competency but as a central factor that can amplify or attenuate the persuasive power of digital marketing constructs.

The findings of this study offer several actionable insights for marketing managers and brands considering or currently leveraging virtual influencers in their digital strategy. Given that perceived authenticity is the strongest driver of brand trust, managers should move beyond purely aesthetic design. Brands and agencies developing or collaborating with virtual influencers must focus on crafting relatable narratives, consistent personalities, and transparent communication. Second, while source attractiveness is a significant factor, its power lies in strategic alignment. Managers should select or design virtual influencers whose attractiveness encompassing visual style, communication tone, and values closely aligns with the brand's identity and target audience. The moderating role of digital literacy necessitates a segmented marketing approach. For audiences with high digital literacy, campaigns should be more transparent, technologically sophisticated, and focus on high-quality, innovative content that can withstand critical scrutiny. For segments with lower digital literacy, the persuasive power of authenticity and attractiveness cues is stronger and can be leveraged with a more direct narrative.

There are a number of limitations to this study that could open up new research directions. First, only respondents from Generation Z and Generation Y were included in the research sample, which may not accurately reflect the variety of the Indonesian community, especially when it comes to variations in consumer behavior, economy, and geography. Future research should expand the market segment coverage to understand how age variations affect consumer perceptions of virtual influencers.

Second, this study uses online questionnaires to collect self-reported data, which might lead to response bias. Deeper understanding of consumer attitudes and actions regarding virtual influencers may be possible with the application of qualitative techniques like focus group discussions (FGDs) and in-depth interviews.

Finally, the short-term customer involvement is the main emphasis of this investigation. Future studies might examine how customer interactions with virtual influencers affect brand loyalty and buying patterns over the long run. Furthermore, it's critical to consider how technology advancements like AI-based customisation will increase the efficacy of virtual influencers in marketing initiatives for brands.

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