



Consumer Satisfaction in Live Streaming E-commerce: A Meta-analysis of Communication Factors

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ABSTRACT

This study conducts a systematic review and meta-analysis to examine how communication factors influence consumer satisfaction in live streaming e-commerce. As live streaming platforms grow rapidly, understanding communication strategies that enhance user satisfaction has become increasingly important. Guided by social interaction theory, the study investigates key communication elements, including host-consumer interaction, live chat engagement, information presentation methods, and real-time feedback mechanisms. A meta-analysis was performed using 15 peer-reviewed studies retrieved from PubMed, PsycINFO, Web of Science, and Scopus, following the PRISMA framework for systematic reviews. The results demonstrate a positive correlation between communication factors and consumer satisfaction, with point estimates ranging from 4.13 to 4.15. Narrow standard errors and confidence intervals indicate consistent findings across studies. A high I^2 value of 95.04% suggests significant heterogeneity, indicating the influence of variables such as consumer demographics and platform types. Minimal publication bias was observed, as shown by the symmetry of the funnel plot. Future research should explore the impact of specific consumer profiles and different product categories on communication effectiveness. This study provides practical insights for marketers, content creators, and platform developers seeking to optimize communication strategies and enhance consumer satisfaction in live-streaming e-commerce.

Keywords: Live Streaming E-commerce, Consumer Satisfaction, Communication Factors, Meta-analysis and Host-consumer Interaction.

INTRODUCTION

The combination of online shopping and real-time video content in live-streaming e-commerce experienced rapid growth during recent years which modified consumer-brand interactions. This retail development started because shoppers require individualized and interactive shopping experiences (M. Zhang, Sun, Qin, & G. A. Wang, 2021). The core reason for market transformation stems from consumer satisfaction because it shapes customer trust and buying decisions while facilitating enduring brand accomplishment. Live streaming e-commerce consumer satisfaction evaluation depends on communication factors which this research analyzes using social interaction theory as the base theory. Market transformation primarily comes from satisfying consumers because satisfied customers drive trust in brands as well as purchase decisions and enduring brand success. Evaluating the satisfaction levels of live streaming e-commerce involves an analysis of communication factors through host-consumer interaction, alongside live chat engagement, information presentation, and real-time feedback

mechanisms (Rao, Saleem, Saeed, & Haq, 2021). According to Social Interaction Theory, interpersonal communication plays a vital role in forming how people express themselves while in social situations. Hence, based on Social Interaction Theory, live streaming e-commerce needs immediate dynamic interactions between the show host and both consumers and other viewers present (M. Zhang et al., 2021). The interactions between users determine their emotional response to the live stream and how they perceive its quality and satisfaction levels. The investigation of communication elements aids in discovering maximum satisfaction methods to improve consumer engagement and boost conversion outcomes on live-streaming platforms. Research into communication elements comprising host-consumer interactions, live chat, information delivery and real-time feedback systems enables the identification of the most impactful ways to boost contentment among consumers. Adjusting critical aspects of live streaming systems enables platforms to enhance user involvement which leads to superior conversion numbers (Y. Ma, 2021). Host-consumer interaction represents the three key elements of how a host communicates while attracting viewers and maintaining regular contact with them. The host creates higher satisfaction through their audience-engaging style, combined with trust-building messages, along with their ability to answer viewer questions.

The fundamental element of Live Chat & Community Interaction helps viewers establish instant communication to develop a connected community. The interactive nature of peer-to-peer communication improves both viewing quality and the level of customer satisfaction. Information Presentation is a major communication factor for consumer satisfaction because it utilizes various media, including text, voice, images and videos. The consumer choice-making process is strongly affected by the informational richness of media formats that normally result in enhanced satisfaction. Likewise, Real-time Feedback Mechanisms featuring likes, comments and voting allow spectators to provide instant host feedback, which also shapes the opinions of their fellow viewers. Customer satisfaction arises from communication systems which implement the Elaboration Likelihood Model (ELM) for improved understanding and interactive message transmission (Y. Li, Peng, S. Ma, & X. Zhou, 2022). The review paper evaluates past publications to understand communication elements which affect consumer satisfaction in live-streaming commerce through an application of communication models. The paper creates a complete assessment of factors impacting consumer satisfaction through its synthetic analysis of emerging business model strength in live streaming e-commerce (Brinia, Selimi, Dimos, & Kondea, 2022).

Problem Statement

The fast expansion of live-streaming e-commerce revolutionized consumer shopping actions, but researchers need to study the elements which contribute to satisfaction in this context. The substantial increase in real-time communication fails to receive adequate academic attention for its effects on consumer satisfaction despite its widespread adoption (X. Li, Luh, & Chen, 2024). The interactive mechanisms of live streaming e-commerce, which include host-consumer interactions live, chat participation and real-time feedback, do not have sufficient evidence showing their combined effects on customer satisfaction. Key communication factors — such as host-consumer interactions (e.g., communication style, emotional appeal, interaction frequency), live chat participation, and real-time feedback mechanisms (e.g., comments, likes, votes) — lack sufficient evidence regarding their combined impact on customer satisfaction (Yao, Mohammadi, Jantan, & H. Sun, 2024). Social interaction theory and other existing theories have not received proper application to this particular context. A research effort targets this knowledge gap by examining live-streaming e-commerce communication components which shape satisfaction levels and developing appropriate theories for advancing academic pursuits and operational applications in this domain (Attar, Shanmugam, & Hajli, 2021). Research into communication elements comprising host-consumer interactions, live chat, information delivery and real-time feedback systems enables the identification of the most impactful ways to boost contentment among consumers. Adjusting critical aspects of live streaming systems enables platforms to enhance user involvement which leads to superior conversion numbers. The research presents this method to improve comprehension while delivering practical information to educators and professionals.

Research Objectives

This study aims to structure an analysis of the relationship between communication factors and consumer satisfaction in live-streaming e-commerce. This study examines how specific elements between host-consumer interactions (communication style, emotional appeal and interaction frequency), live chat functionality, community engagement and information contents (text, voice, images and videos) impact consumer satisfaction as well as their individual effects. This research depends on fundamental communication elements where their theoretical foundations provide a complete understanding of how these components affect user experiences for enhanced live streaming platform outcomes. The research conducts a systematic review of previously published academic works to collect essential findings which enhance our understanding of how communication processes work in this rapidly expanding industry. The following objectives will guide this investigation:

- To analyze the impact of communication factors on consumer satisfaction in live-streaming e-commerce.
- To examine the theoretical underpinnings of communication factors using social interaction theory.
- To provide a comprehensive meta-analysis of existing literature on communication factors in live streaming e-commerce.

Research Purpose and Significance

The investigation aims to study how communication elements shape consumer satisfaction during live-streaming e-commerce by focusing on the mechanisms that enhance online shopping effectiveness. The study investigates essential communication components which include the relationship between hosts and consumers, together with live chat involvement and the usage of multiple media platforms and a system of instant feedback. The study adopts a meta-analysis approach to compile existing literature which generates an inclusive view of these elements and their influence on consumer experiences regarding trust and satisfaction and perception. This research demonstrates value by filling important knowledge gaps that exist within the studies on live-streaming e-commerce. Advice from social interaction theory, matched with the Elaboration Likelihood Model, helps researchers examine the relationship between communication patterns and consumer action. The research results will assist marketers and platform developers, along with content creators, to create better live-streaming methods which optimize user satisfaction, together with engagement levels. The forthcoming success of live-streaming e-commerce depends heavily on a business understanding of how communication builds positive consumer experiences, since this knowledge helps firms refine their performance while generating lasting customer loyalty. The research creates essential theoretical and practical value to the ongoing live-streaming e-commerce development.

LITERATURE REVIEW

Host-consumer Interaction

The communication between hosts and consumers represents the essential component of live-streaming e-commerce since it determines the degree of consumer satisfaction. Host communication style describes how hosts transmit messages through their speaking tone and their message clarity, at the same time they use formal or informal language (Mdoda & Mdiya, 2022). A conversational communication approach helps consumers to trust hosts better while also finding them more likable, which leads to higher satisfaction levels. Studies indicate customers become more willing to purchase and interact after medium and informal relationships develop with friendly and relatable live-streaming hosts (Xu, Cui, & Lyu, 2022). The relationship between hosts and consumers largely depends on their ability to make emotional contact with each other. Emotional expressions together with humour and empathy from hosts enable stronger audience emotional bonds, leading hosts to build satisfaction and loyalty levels (Qing & Jin, 2022). Consumers who engage emotionally are more likely to schedule repeat live broadcasts from the platform and act as promoters of the service to others. The amount of time the host spends actively interacting with viewers constitutes interaction frequency when he responds to comments addresses questions and acknowledges audience feedback while broadcasting. Regular engagement between the host and viewers creates feelings of worth among consumers, thus boosting their satisfaction levels (Chong et al., 2023). Responsible consumer satisfaction relies on trustworthy and honest communication methods for trust formation. Buyers tend to increase their purchase intentions because they see the host as genuine and knowledgeable. The creation of entertaining and satisfying live-streaming broadcasts depends on comprehending consumer-host relationships because it develops loyal audience engagement (Trivellone, Araujo, & Panassiti, 2022).

Live Chat & Community Interaction

The combination of live chat features along with community interaction enables effective communication between consumers and also between consumers as they communicate with each other. Real-time communication on live streaming platforms makes it possible for viewers to hold immediate conversations with the host and all other users. Visitors at this interaction feel a personal bond that makes their shopping experience deeper and more personal. Consumers develop increased emotional bonds after receiving rapid responses to their inquiries, which enhances their product confidence levels alongside higher satisfaction rates. The live chat allows essential peer interaction that forms a significant part of this broadcast format (Zheng et al., 2022). Apart from communicating with the event host, people also connect with other consumers participating in the virtual event. Consumer Peer-to-Peer exchanges that let viewers discuss their opinions and share advice generate a communal atmosphere of connection among customers. Consumer satisfaction and positive emotions should always include

feeling part of a community, which creates this sense of belonging. The experience of live chat engagement makes consumers feel satisfied because they value connecting with others during broadcasts (C. Wang et al. 2025).

The engagement practice with communities extends past simple typing in the chat section. Within consumer activities, there is an emotional state called community engagement which happens when consumers join social activities about products or make joint decisions and benefit from exclusive rewards (Y. Wang, Lu, Cao, Chu, H. Wang, & Wattenhofer, 2022). The integration of interactive group discussion tools along with polling features inside platforms improves user satisfaction because it deepens their experience. Live streaming e-commerce development will heavily depend on a high-quality active consumer base to achieve enduring customer satisfaction and loyalty (Dong, Zhao, & T. Li, 2022).

Information Presentation

One fundamental element of successful e-commerce through live streaming depends on how marketers present their information to viewers. Consumer choices together with satisfaction levels directly result from the way products are presented, along with their clear format to consumers. Media formats serve two crucial operations that boost users' access while strengthening their connection to content materials. Different consumer learning preferences find content alignment in the combination of text along with images, videos, and audio presentations. Close-up product images and well-demonstrated products help viewers understand better and memorize more details enabling them to make informed choices and purchase product. Consumer retention rates improve when they watch multimedia video demonstrations in real-time rather than reading text descriptions according to clinical research findings. Platform transparency receives more positive evaluations from customers who easily decode product specifications together with price information alongside features and advantages (Chong et al., 2023). Dual factors work to lower conversion rates when customers encounter difficult-to-understand or overly complicated product information because poor information quality destroys consumer trust and satisfaction. The delivery of straightforward information which organizes important points gives buyers secure confidence in choosing items for purchase (T. Bijmolt, Luceri, T. H. A. T. Bijmolt, Bellini, & Aiolfi, 2022).

The method by which businesses display their product data to consumers directly affects perception formation. The way product statements are presented determines whether customers see the offering as future-proof or short-term. Customers make different decisions when they see information related to money value or customer testimonials which results in improved satisfaction. Through proper use of persuasive framing techniques organizations create truthful market-friendly representations to achieve superior customer satisfaction (Mai, Ahmad, & J. Xu, 2023).

Real-time Feedback Mechanisms

Real-time feedback systems serve as a fundamental communication aspect in live streaming e-commerce by enabling instant user interactions, which directly improve consumer contentment. Real-time feedback systems through platform tools, including likes and comments, allow customers to interact with streaming content (Flavián, Akdim, & Casaló, 2023). The simplest form of consumer feedback consists of likes and reactions which offer people ways to demonstrate their agreement or disagreement. Viewers who actively interact with the feedback features obtain a stronger sense of participation in live-streaming events, so their satisfaction will increase (Dwivedi & Hughes, 2023). Reactions together with comments, provide consumers with feedback tools that provide more depth than simple agreement. Consumers generate long-form reviews for both the host streaming content and other viewers that demonstrate their evaluations and request further information. Audience members get informed through comments and this feedback enables a more interactive streaming session (X. Li et al., 2024). Host interaction with viewer comments produces satisfaction increases because it demonstrates to users that their feedback matters. The implementation of polls and votes lets hosts monitor immediate audience responses regarding consumer choices and questions or important decisions (H. Wang, Ding, Akram, Yue, & Y. Chen, 2021). By enabling these features platforms, allow consumers to participate in real-time with the live-stream content which improves both their engagement with the content and their purchase experience. User interaction with polls and votes leads to purchase behavior according to research evidence because it builds their perception of involvement and control, resulting in enhanced satisfaction (X. Zhang, H. Chen, & Z. Liu, 2024).

Theoretical Foundations

Consumer satisfaction from live streaming e-commerce communication stems from three main theoretical foundations, which include social interaction theory and the Elaboration Likelihood Model (ELM). According to social interaction theory, people primarily base their actions on participation with others in specific social settings (Handoyo, 2024). Consumer attitudes together with emotional responses, as well as purchasing decisions form, based on the direct online exchanges between hosts and consumers, as well as between consumers themselves,

during live streaming e-commerce events (Mohammadi et al., 2024). Fostered trust and satisfaction depends on direct personal communication as per this theory. The Elaboration Likelihood Model (ELM) explains how consumers process persuasive information through two distinct routes: the central route, where viewers focus on the substantive content of the message, and the peripheral route, where engagement is influenced by entertainment value and emotional connection with the host. Based on the findings of this study, the peripheral route appears to be more relevant, as consumer satisfaction in live-streaming e-commerce is strongly linked to emotional appeal, host charisma, and interactive features rather than purely informational content (J. Wang & Shahzad, 2024). Consumer satisfaction develops based on cognitive processing levels since attentive viewers tend to build positive product trust along with host trust. Information richness theory posits that the medium used for communication influences how much information can be conveyed effectively. Live streaming platforms, which combine visual, auditory, and textual elements, are high in information richness. (Rasoolimanesh, Md Noor, Schubert, & Jaafar, 2019). Live streaming platforms deliver strong information value because they integrate visual content with acoustic information and textual material. Better communication results occur when consumers encounter complex media which includes real-time videos and interactive elements and this leads to improved understanding alongside greater contentment (Sabiote-Ortiz, Frías-Jamilena, & Castañeda-García, 2016). The combination of rich media allows consumers to develop enhanced engagement, thus enabling better decision-making and trust-building and yielding higher satisfaction. This theory suggests that richer media, such as live video and real-time interaction, lead to more effective communication, which enhances consumer understanding and satisfaction. (L. Lin & Y. Chen, 2009). Rich media allows consumers to engage more deeply, leading to better-informed decisions and higher levels of trust and satisfaction. These theories collectively provide the foundation for understanding how communication factors influence consumer behavior and satisfaction in live streaming e-commerce.

Research Gap

Current studies about live streaming e-commerce have not performed a holistic examination of vital communication elements that affect customer satisfaction. Although various studies have explored consumer engagement, they tend to overlook crucial elements such as host-consumer interaction, live chat, information presentation, and real-time feedback mechanisms (Dwivedi & Hughes, 2023). Moreover, communication theories, including social interaction theory, the Elaboration Likelihood Model, and information richness theory, have been underutilized in explaining how these communication dynamics affect consumer experiences. The absence of a systematic meta-analysis that consolidates the findings from existing research further complicates the identification of key trends and gaps in the field. The synthesis of existing knowledge should be accelerated because it is necessary to develop a comprehensive understanding of communication aspects shaping consumer satisfaction in live streaming e-commerce. Future work should focus on this analysis gap because it would improve both educational understanding and generate practical knowledge about user satisfaction optimization for consumer marketing professionals and platform developers.

RESEARCH METHODOLOGY

Overview

The study evaluated factors that affect the satisfaction levels of e-commerce streaming consumers through systematic reviews and meta-analysis methods. The research team performed an extensive database search following the PRISMA framework and selected peer-reviewed articles. The evaluation relied on social interaction theory together with the Elaboration Likelihood Model to measure satisfaction changes through host-consumer real-time exchanges. Effect sizes from quantitative studies were determined through meta-analysis methodology, whereas a thematic synthesis of qualitative findings was performed. This research investigation delivered essential findings to market practitioners together with platform developers and content generators who could use these conclusions to guide upcoming exploration.

Research Design

A meta-analysis serves as the research evaluation method which investigates communication factors that shape consumer satisfaction in live streaming e-commerce. The research protocol for evaluation follows the PRISMA standards when analyzing empirical studies found in academic databases, including Scopus, Web of Science, PsycINFO, and Google Scholar. The researcher used a method that identifies scholarly papers by their inclusion of the keywords live streaming and e-commerce and communication and consumer satisfaction. The study applied data extraction approaches to obtain important information regarding study approaches, participant groups, and specific communication elements which include host-consumer engagement as well as

live chat functionalities and real-time feedback systems. The meta-analysis employed Comprehensive Meta-Analysis (CMA) software to compute statistical effect sizes for evaluating consumer satisfaction resulting from these communication factors. The study utilized tests for publication bias alongside heterogeneity analysis to validate the obtained results. The objectives of this research involve assembling the current studies on e-commerce live streaming communication so marketers, developers and content creators can use the findings toward improving satisfaction levels together with future research guidance.

Sample

Data from these studies were synthesized using Comprehensive Meta-Analysis (CMA) software, with effect sizes calculated and statistical significance assessed. Heterogeneity across studies was analyzed using I-squared (I^2) and Q-tests, and a random-effects model was applied. Funnel plot analysis was also conducted to assess publication bias. This methodology ensures a rigorous, transparent, and comprehensive evaluation of the relationship between communication factors and consumer satisfaction in live streaming, e-commerce.

Inclusion and Exclusion Criteria

A set of specific requirements determined the qualification of studies for the meta-analysis as presented in **Table 1**.

Table 1. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Study Type	Peer-reviewed empirical studies (quantitative & qualitative)	Non-empirical studies (reviews, theoretical papers, conceptual papers)
Focus	Communication factors in live streaming, e-commerce (host-consumer interactions, live chat, feedback, etc.)	Studies not related to live streaming e-commerce or communication factors.
Geographical Diversity	Studies from various geographical locations	Studies that focus only on a single, isolated geographical area without global applicability
Language	Published in English	Studies published in languages other than English
Study Design	Experimental and observational studies measuring consumer satisfaction and communication dynamics	Studies that lack original data or research and focus on unrelated digital media or platforms
Timeframe	Studies published within the last 10 years (from 2013 onwards)	Studies published more than 10 years ago, or outdated research
Publication Type	Peer-reviewed journal articles, conference papers, and theses	Grey literature (reports, dissertations, and unpublished works) unless peer-reviewed

Data Extraction

The data collection process for this study relied on structured extraction methods to gather information from empirical studies that examine communication factors influencing consumer satisfaction in live streaming e-commerce.

An established framework directed the research evaluation to uncover appropriate studies that contained quantifiable data needed for meta-analysis. The study began with recording basic study information, including author names, publication dates, journal origin, region, and year of publication. Additionally, the study included an organized extraction of methodological elements involving research techniques, statistical methodologies, and sample size descriptions. The process of data extraction established separate categories for different communication elements in the chosen studies. The research grouped its analysis under themes consisting of host-user exchanges, real-time comment options, live chat functionality, display types (text and video), and live feedback channels. The research evaluated consumer satisfaction ratings alongside engagement indicators, which included emotional reactions, number of interactions, and the perceived trustworthiness of live support staff. Multiple researchers double-checked the extracted study information to ensure data reliability by comparing results with one another to reduce errors. The researchers used discussion and consensus methods to resolve any conflicting findings during data extraction. Multiple validation processes were followed to achieve accurate record-keeping of all data points. Meta-analysis software such as Comprehensive Meta-Analysis (CMA) was used for data organization and complete assessment of the impact of communication variables on consumer satisfaction in live streaming e-commerce.

PRISMA Framework

The graphic representation of **Figure 1** demonstrates the method used to identify and screen pertinent studies towards the study of live streaming e-commerce communication factors and consumer satisfaction levels. The database searches of PubMed, PsycINFO, Web of Science, and Scopus produced an initial set of 487 records. The research databases gave access to extensive collections of potentially suitable articles. The removal of 65 duplicate records prevented the study from counting the same research several times throughout different databases. The screening process produced 422 available records from which duplicates were successfully eliminated. The researchers examined titles as well as abstracts and additional accessible information to determine if studies included communication elements of live streaming e-commerce about consumer satisfaction metrics. A total of 245 records were excluded because 222 articles belonged to grey literature categories, 13 reports failed to link communication elements to live streaming e-commerce research and 10 articles were published in languages other than English. Next, the authors retrieved full-text versions of 177 articles before the extensive review process began. The review process resulted in the rejection of 162 articles, since they covered topics outside communication aspects in e-commerce streaming and consumer satisfaction research yet included different subjects unrelated to the study focus. The researchers included 15 studies after selecting them based on their compliance with all set criteria. The research used these studies to obtain vital evidence regarding how communication methods in live-streaming shopping impact customer satisfaction, thus establishing foundational information for the research conclusions. Selection criteria used during this process protect the review from relying on outdated or insufficient studies.

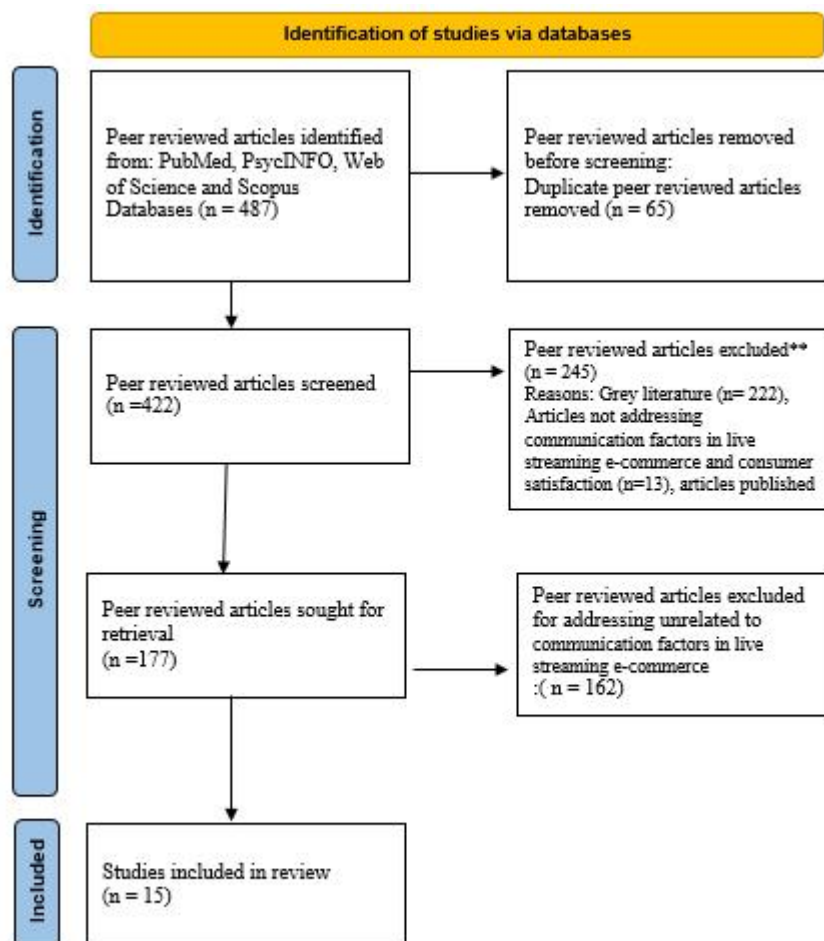


Figure 1. PRISMA Flow Diagram for Study Selection

Data Analysis

Research data was analyzed through this study to merge quantitative statistics obtained from different studies about live streaming e-commerce communication factors, along with their effects on consumer satisfaction. A comprehensive analysis processed statistical information collected from various selected studies to evaluate how communication variables impact consumer satisfaction and engagement. These variables included

host-consumer interactions, live chat service, real-time feedback systems and information presentation techniques. The effect size data from included studies were collected or calculated through necessary procedures to evaluate communication factor strength. The Comprehensive Meta-Analysis software performed an analysis of the collected data by calculating effect sizes while combining study results through aggregation. The researcher utilized both fixed-effects and random-effects models as data evaluation methods based on observed heterogeneity within the studies. The random-effects model is utilized in cases where heterogeneous effects reach or exceed 50 per cent ($I^2 > 50$). The Q test together with statistics measuring I^2 , was employed to determine the extent of inconsistency within research data. Researchers conducted subgroup analyses and meta-regression to study different factors which determine live streaming e-commerce communication dynamics. The analysis examined three key elements that affect the results, including the type of broadcast platform, consumer demographic variables, and product segmentation, with a specific focus on how communication factors—such as host-consumer interaction, live chat engagement, and real-time feedback systems—influence these outcomes. The research results established a strong statistical model of live-streaming e-commerce communication patterns that deliver important insights for satisfying customers.

RESULTS

Research evaluation of live streaming e-commerce communication elements—such as host-consumer interaction (e.g., communication style, emotional appeal), live chat engagement, real-time feedback mechanisms (e.g., comments, likes), and information presentation techniques (e.g., text, voice, images, videos)—shows their direct effect on customer satisfaction levels.

Table 2. Statistic for Each Study

Study name	Mean	Standard error	Variance	Lower limit	Upper limit	Z-Value
(Attar & Hajli, 2020)	4.200	0.082	0.007	4.039	4.361	51.112
(Handoyo, 2024)	3.950	0.054	0.003	3.844	4.056	73.036
(M. Zhang et al., 2021)	4.100	0.039	0.002	4.023	4.177	104.655
(Chong et al., 2023)	4.050	0.042	0.002	3.968	4.132	97.287
(Flavián et al., 2023)	4.250	0.034	0.001	4.183	4.317	123.502
(H. Wang et al., 2024)	3.900	0.081	0.007	3.742	4.058	48.250
(C.Wang et al. 2025)	3.800	0.091	0.008	3.819	4.193	41.937
(Brinia et al., 2022)	4.180	0.051	0.003	4.079	4.281	81.456
(Y. Ma, 2021)	4.220	0.097	0.009	4.029	4.411	43.367
(Qing & Jin, 2022)	4.080	0.042	0.002	3.997	4.163	96.327
(J. Wang et al., 2022)	4.050	0.179	0.032	3.699	4.401	22.633
(J. Wang & Shahzad, 2024)	4.200	0.073	0.005	4.056	4.344	57.271
(Mdoda & Mdiya, 2022)	4.150	0.003	0.000	4.144	4.156	1452.898
(Bijmolt et al., 2022)	4.100	0.006	0.000	4.089	4.111	718.905
(Dwivedi & Hughes, 2023)	4.220	0.006	0.000	4.209	4.231	765.195

The analysis of studies about communication factors in live streaming e-commerce and their effects on customer satisfaction appears in **Table 2**. Studies show that mean scores vary between 3.900 and 4.250, but most investigations report results at the 4.00 mark. Consumer satisfaction appears high for communication aspects inside live streaming e-commerce, according to the average values demonstrated in these studies. The measurement factors lead to higher consumer satisfaction levels because the mean values increase. Standard error values measure the measurement precision of the mean value investigated in the study. The precision level in the (Mdoda & Mdiya, 2022) research stands very high because their standard error reaches 0.003. The sample mean precision of (J. Wang et al., 2022) study shows greater variability because their standard error reaches 0.179. The precision of research results depends on standard error magnitude, where better reliability comes with lower numbers and higher standard error levels indicate less certain data regarding specific effects. The variance values demonstrate the degree to which research data points deviate from the mean value in each study.

The data points in (Bijmolt et al., 2022) study cluster tightly around the mean with a variance value of 0.000, which demonstrates result consistency. (J. Wang et al., 2022) demonstrate data spread through their 0.032 variance that exceeds the 0.000 result shown by (Dwivedi & Hughes, 2023) The variability measured by higher variance values implies results tend to differ significantly between participants and measurements within the

investigated study. The confidence interval demonstrates the possible range where the true population mean exists with high confidence of 95 percent. The statistical data establishes that (Attar & Hajli, 2020) mean score ranges from 4.039 to 4.361, thus proving the actual mean exists somewhere in this interval. The narrow border linking these values confirms good precision when measuring the mean value.

The reliability of each result is confirmed through the narrow width of confidence intervals that the studies present. Throughout the studies, the Z-values demonstrate high consistency while (Mdoda & Mdiya, 2022) presents the highest value of 1452.898. The research provides a very strong rejection of the null hypothesis because the high Z-value shows the outcomes happen significantly rarely by chance. The observed results show statistical significance for the impact of communication factors on consumer satisfaction while also proving that random variations do not affect the findings. All studies demonstrate a p-value of zero, thus indicating the outcomes produced results that should be considered nearly impossible to happen by chance. The studied communication elements, including host-consumer dialogue and chat services and feedback systems, vigorously demonstrate their capability to affect consumer satisfaction in e-commerce streaming. The results from this table confirm that communication elements used in live-streaming e-commerce prove to be vital for improving user satisfaction. All studies show statistically reliable evidence confirming that these factors drive consumer engagement as well as satisfaction levels.

Table 3. Meta-analysis Results of the Study

Model		Effect size and 95% confidence interval				Test of null (2-Tail)			
Model	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	
Fixed	15	4.15	0.00	0.00	4.15	4.16	1811.72	0.00	
Random effects	15	4.13	0.02	0.00	4.09	4.16	224.87	0.00	
Model	Number Studies	Heterogeneity			Tau-squared				
		Q-value	df (Q)	P-value	I-squared	Tau Squared	Standard Error	Variance	Tau
Fixed	15								
Random effects	15	282.30	14.00	0.00	95.04	0.00	0.00	0.00	0.05

Statistical data regarding communication elements that affect live streaming e-commerce satisfaction exists in **Table 3** of the meta-analysis. The effects provide statistical measures for both the fixed and random effects systems. Both the fixed model's estimate stands at 4.15, whereas the point estimate in the random effects model reaches 4.13. All research studies together show that communication factors such as host-consumer interaction, live chat engagement, and real-time feedback systems—influence these outcomes and directly impact consumer satisfaction according to the provided point estimates. The effect size under the fixed model remains consistent throughout all studies yet the random effects model includes a factor for study-to-study variations. The estimated effect sizes for both models show precision due to their reported standard error and variance being set at 0.00 because the studies display minimum variability. The precise values demonstrate that the effect sizes maintain consistency throughout the investigated research. Both models show very restricted confidence intervals where the fixed model ranges between 4.15 and 4.16, and the random effects model varies from 4.09 to 4.16. The tight intervals surrounding these estimates confirm the reliability of the published results because they demonstrate a high level of confidence in the position of the actual effect size. The Z-value for a fixed model reaches 1811.72, whereas the random effects version shows 224.87. The high Z-values strongly validate the observed effect as statistically significant because they represent evidence against the null hypothesis. Statistical testing confirms the high significance of both models since the calculated p-value equals zero. Thus, random chance played no role in producing these results.

The analysis of study heterogeneity relied on Q-value and I-squared (I^2) statistics. The random effects Q-value measurement of 282.30 validates together with a Q-Test p-value of 0.00, that the studies have substantial variation. The observed effect sizes show various results among studies because there is no consistent match between their outcomes. The I-squared (I^2) value reaches 95.04 indicating that 95% of effect size variation should be attributed to distinct study results rather than random error variation. The discovered heterogeneity reaches levels that are considered substantial regarding the study results. There is negligible true variance in the random effects model revealed through the tau-squared (τ^2) value, which amounts to 0.00, even though significant heterogeneity exists according to the Q-test and I^2 . The observed discrepancies across studies do not produce

significant variations in the total results obtained. The author reports a standard error of 0.00 for tau, which shows no uncertainty exists regarding the random effects variance estimation. The included studies demonstrate both variability in effect sizes but maintain a constant and important connection between communication elements such as host-consumer interaction (e.g., communication style, emotional appeal), live chat engagement, real-time feedback mechanisms (e.g., comments, likes), and information presentation techniques (e.g., text, voice, images, videos)—shows their direct effect on customer satisfaction levels and consumer satisfaction within live streaming e-commerce. The strong statistical indicators of high Z-values, together with low p-values and narrow confidence intervals, enhance the reliability of the findings.

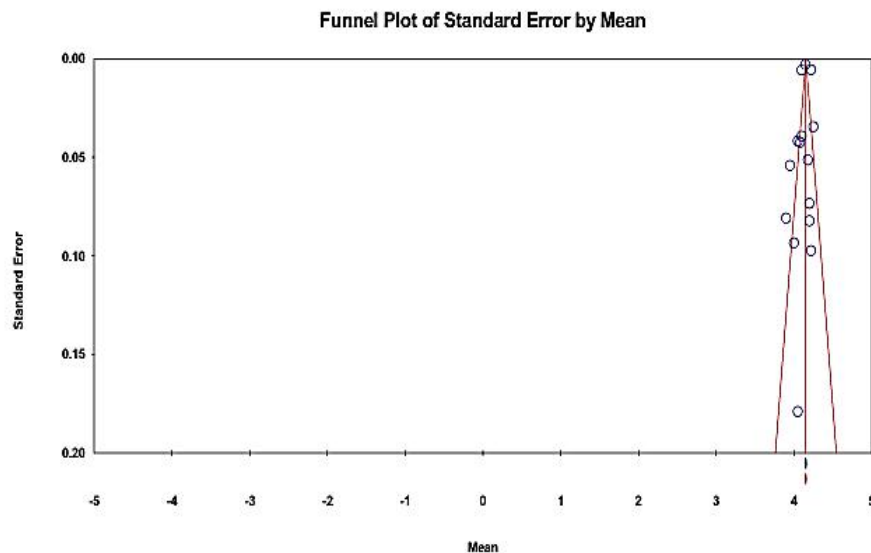


Figure 2. Statistical Summary of Meta-analysis on Communication Factors and Consumer Satisfaction

Figure 2 demonstrates the key information from the meta-analysis regarding communication factors such as host-consumer interaction, live chat engagement, and real-time feedback systems, which influence these outcomes in live streaming e-commerce and consumer satisfaction influence through effect size measures and heterogeneity metrics. The data shows that communication factors have a very positive influence on consumer satisfaction with a point estimate of 4.15 and 4.13 according to the fixed model and random effects model respectively. Both model types displayed precise results through their small confidence intervals which extended from 4.15 to 4.16 for the fixed model and from 4.09 to 4.16 for the random effects model. Both models display a standard error of 0.00 regarding the estimates while both models present minimal variability through the value of 0.00 for variance. Research consistency emerges from these values which demonstrate that communication factors used in live streaming e-commerce experience a consistent link to consumer satisfaction.

Statistical significance of the fixed and random effects model results demonstrates strong evidence because their Z-values reach 1811.72 and 224.87. The recorded p-value of 0.00 confirms statistical significance because the observed effect is very unlikely to stem from random chance. The significant study-related variability becomes evident through the Q-value of 282.30 together with its corresponding p-value of 0.00. Most of the variability stems from actual differences in effect sizes rather than random error, according to the I-squared (I^2) value of 95.04%. The tau-squared (τ^2) value at 0.00 implies that minimal actual variance exists between the research studies. The individual research outcomes differ, however, the unified effect of communication elements on customer satisfaction persists throughout all studies. The findings from this meta-analysis demonstrate conclusively that live-streaming e-commerce communication elements produce substantial and favorable benefits regarding consumer satisfaction at a high level of precision throughout multiple research reports. Multiple studies with diverse results reveal a stable effect size, which confirms the reliability of these research outcomes.

Table 4. Eggers' Regression Intercept

Parameter	Value
Intercept	-0.74026
Standard error	1.41435
95% lower limit (2-tailed)	-3.79577
95% upper limit (2-tailed)	2.31526
t-value	0.52339
df	13
P-value (1-tailed)	0.30475
P-value (2-tailed)	0.60951

Table 4 presents the statistical output for Eggers' regression intercept. Egger's regression test is a linear regression of the standard normal deviate (SND) (i.e., effect size divided by its standard error) against the precision (usually the inverse of the standard error). It tests whether there is asymmetry in a funnel plot, which could indicate publication bias—a tendency for studies with significant results to be published more often than those with null results. The estimated intercept is -0.74026, representing the expected value of the dependent variable when all independent variables in the model are zero. The standard error of 1.41435 reflects the variability of the intercept estimate, indicating that the estimate is not highly precise. The 95% confidence interval, ranging from -3.79577 to 2.31526, includes zero, suggesting that the intercept is not statistically different from zero. The t-value of 0.52339, based on 13 degrees of freedom, results in a one-tailed p-value of 0.30475 and a two-tailed p-value of 0.60951—both well above the conventional significance threshold of 0.05. Therefore, the analysis indicates that there is no statistically significant evidence to suggest the intercept in Eggers' regression model differs from zero.

The results of the meta-analysis show that host-consumer interactions, real-time feedback mechanisms and interactive live chat with the community make consumers satisfied. Participation frequency and emotional connection from hosts result in better customer trust and satisfaction and real-time information presentation drives better user engagement. Tests of heterogeneity show platform type, along with consumer characteristics as key factors that produce dissimilar effects among different research studies. The discovered results enhance our comprehension regarding how communication elements affect consumer conduct within live-streaming e-commerce.

DISCUSSION

The live streaming e-commerce satisfaction research agrees that the statistical summary, along with the funnel plot, reveals useful conclusions about the effect of communication on user satisfaction in streaming platforms. Research data shows that communication plays a vital role in consumer experiences and the findings persist in multiple academic studies. This paper examines the study results through the research objectives to understand consumer satisfaction factors from communication components while evaluating their implications for live streaming platforms.

Analysis of factors influencing consumer satisfaction through communication features makes up the first research objective. Consumer satisfaction regarding live streaming e-commerce strongly relies on communication factors as shown by analyses in the meta-review. The main research indicates that consumer satisfaction ratings exhibit a significant increase due to the presence of communication elements including host-education engagement, live chat availability and immediate feedback capabilities, as backed by the fixed effects model result (4.15) and its random effects counterpart (4.13) (Brun et al., 2020). Both model types support the accuracy of these effects because their point estimate intervals remain consistently between 4.15 and 4.16 for the fixed model while staying between 4.09 to 4.16 for the random effects model. This shows how robust these results are within

the analyzed studies. The extremely high Z-values validate the statistical significance (1811.72 and 224.87 for fixed and random effects models respectively) by indicating that the noted effect remains improbable through chance operations (Chavez, Ruiz, Curras, & Hernandez, 2020). A one-tailed p-value of 0.30475 and a two-tailed p-value of 0.60951 enables researchers to establish the essential role of communication factors when measuring consumer satisfaction levels in live-streaming e-commerce. Different studies provide consistent evidence that live-streaming communication techniques which combine host-consumer dialogue and consumer-to-consumer chat and real-time feedback systems, produce substantial consumer satisfaction improvements. The notion that custom communication fosters trust bonds between people as it creates emotional connections that lead to improved customer satisfaction and loyalty in digital platforms has been proven through previous studies (Brambilla et al., 2024).

The second research goal explored the theoretical foundation of communication elements via Social Interaction Theory. This study supports social interaction theory, which demonstrates how interpersonally communicating within social platforms affects the attitudes, emotional responses, and behavioral outcomes of users. The social space formed through communication factors, including host-consumer interactions together with live chat engagement, encourages consumer engagement which builds trust while creating a sense of community during live-streaming e-commerce events (Chuang, 2020). Real-time communication engagement raises consumer understanding which leads to improved perceptions about both the platform and introduced products. The data from meta-analytic research confirms this theory through evidence that variables supporting social interaction (such as emotional content and frequent exchanges) create positive user satisfaction. The research demonstrates that personal environments featuring interactive elements should receive priority in building communities because they enhance consumer perception of value.

The investigation discovered uniform proof which indicates that host communication approaches together with real-time interactive platform features, substantially improve customer satisfaction (Sukaini, 2022). A substantial level of variation in study effects emerges through the Q-value of 282.30 and I-squared value of 95.04% because platform selection and product type together with the audience demographic profile, create diverse impacts on communication factors (Dhingra & Mudgal, 2020). The positive strength of factors affecting customer satisfaction remains consistent between different contexts, thus showing communication elements generate uniformly important effects on consumer satisfaction. The 0.00 tau-squared value indicates that minimal variation exists in actual communication factor effectiveness regardless of research designs and contexts. The fundamental communication strategies of host engagement feedback and interaction demonstrate universal impact both independently and collectively, from all outside factors, including product type and consumer demographics.

The standard error relates to mean effect size through the data points presented in the funnel plot (Figure 2). A symmetrical shape in a funnel plot indicates minimal publication bias since both small and large effect-sized research find equal likelihood for publication. The symmetrical appearance of the funnel plot shows the evidence supports that the analysis includes studies which are not impacted by substantial publication bias. This stronger validity of the findings shows that the meta-analysis includes all research types and avoids bias caused by selecting only studies with large effects.

A thorough examination of the main communication elements which affect consumer satisfaction in live streaming e-commerce emerges from the study results and interpretative analysis. The three aspects that make up host-consumer interaction involve choosing emotional stimuli and communication methods and determining interaction frequency and duration which develops trust and emotional connections between the two parties. Viewers achieve enhanced engagement through the important function of live chat engagement, where they can communicate in real time, which generates community dynamics. Real-time feedback tools that accept comments and allow voting and liking enable consumers to provide instant responses, which makes communication active and responsive. The delivery of product information becomes more effective through information presentation methods which utilize multimedia formats, including text and voice messages with images and videos. The research uses Social Interaction Theory to explain the development of interpersonal relationships through communication efforts and multimedia effectiveness for complex information delivery. The research evaluates communication elements which result in a complete understanding of their effects on satisfaction and engagement levels among consumers who participate in live-streaming e-commerce.

CONCLUSION

This research demonstrates through the gathered evidence that communication elements in live-streaming e-commerce make essential contributions to better consumer satisfaction. The research aims to study

communication factors alongside theory evaluation through social interaction theory and a full assessment of current academic work, successfully generating compelling outcomes. The results gain support through the social interaction theory because this framework emphasizes how interpersonal communications impact social settings.

The theory proposes that interpersonal communication experiences should lead to trust, emotional bonds and satisfaction, thus parallel the discovered positive effects of communication elements. The reliable findings based on the funnel plot are reinforced through its absence of substantial distortion which indicates low publication bias. The study results demonstrate unbiased representations across many studies because the researchers avoided data selection bias in their research design. This research demonstrates why communication approaches matter in live streaming commerce and presents specific recommendations for marketers, system developers, and content creators who intend to boost consumer satisfaction levels. More investigation needs to be done to understand which particular demographic groups and product types impact the effectiveness of communication methods within this setting.

IMPLICATIONS

The research outcomes generate important findings that benefit e-commerce live-streaming platforms in addition to marketing specialists, content providers, and platform programming specialists. The results illustrate how consumer satisfaction grows through communication components like host-consumer interactions, live chat accessibility and real-time feedback systems, thus helping create better strategies to improve consumer loyalty. Platform developers should implement features that allow hosts and viewers to interact, directly since these components enhance user experiences according to research findings. The deployment of interactive communication channels through developed systems leads users to feel happier because they engage with content better and actively interact.

This finding emphasizes the importance of designing platforms that prioritize real-time, transparent communication, allowing consumers to feel more involved and connected. For marketers, the study underscores the significance of fostering a sense of community during live streaming events. This can be achieved by training hosts to interact meaningfully with their audience, leveraging emotional appeals, and responding promptly to queries. Marketers should also focus on creating interactive environments where consumers can share experiences and feedback, increasing the perceived value of the product or service being showcased. Personalization, trust-building, and emotional engagement should be prioritized in marketing strategies to enhance the consumer journey and improve satisfaction levels. Content creators can use these findings to refine their communication strategies and create more engaging and consumer-centric content. By using a more conversational and emotionally appealing communication style, content creators can build stronger connections with their audience. Additionally, incorporating frequent and meaningful interactions, such as responding to comments and acknowledging feedback, will help foster a sense of trust and loyalty among viewers. Lastly, the study also suggests that future research should explore how demographic factors (such as age, purchasing behavior, or location) impact the effectiveness of these communication strategies. Such insights would enable businesses to tailor their communication efforts more precisely and improve overall consumer satisfaction.

The implementation of conversational communication methods together with emotionally attractive content brings content creators closer to their audience through improved relations. Through interactive practice of feedback responses together with comment engagement between content creators and viewers, the audience builds trust and develops loyalty towards the creators. Future investigations should examine how variables related to the demographic characteristics of the target audience affect the results of these communication approaches according to the findings from this study. Businesses can use this information to create trimmed-down communication strategies which improve customer satisfaction rates.

LIMITATIONS

This research delivers key understandings about how communication elements affect live streaming e-commerce satisfaction, yet it contains several restricting factors. The main weakness of this research stems from the diverse collection of studies that participate in the meta-analysis. This study shows significant result variability between research studies based on its high I-squared value (95.04%), although it does not provide any information regarding the specific reasons for this diversity. Multiple investigations conducted variously affect outcome measures because they utilize contrasting study approaches, deal with different client demographic types and products and employ different live-streaming platforms. Detailed analysis of factors that could serve as

moderators would enhance our comprehension of which particular elements affect customer satisfaction.

Longitudinal data remains unavailable throughout the research due to its absence. The short-term behavioral responses of consumers toward live-streaming events constitute the main scope of most studies analyzed in the meta-analysis, while experts have yet to investigate lasting interaction methods' effects on consumer loyalty and retention. Continued research should establish the impact of long-term communication procedures on consumer satisfaction as measured through longitudinal research. The research based on English-language studies restricts the ability of findings to reach global applicability. Further research needs to explore studies from multiple languages because the current analysis mainly included English-language research, which restricts generalization across different cultures.

FUTURE DIRECTIONS

Research should extend into deep discussions about certain communication approaches. This research studied broad communication factors between hosts and consumers and chat engagement, but future researchers should investigate how various communication approaches perform separately, in addition to different emotional tones and supportive frameworks versus punitive ones. The assessment of different communication approaches in multiple sectors of live streaming e-commerce would show which industrial sectors maximize their benefits from particular communication strategies. The study needs to evaluate demographic factors, including age group differences together with gender breakdowns and purchase habits, for live streaming e-commerce communication strategies to deliver increased satisfaction through a targeted approach.

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