

A Review of E-commerce Live Streaming Research

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Abstract: The rapid development of technology has led to the emergence of new business models such as e-commerce live streaming. As a new business model, e-commerce live streaming has promoted the deep integration of digital technology and the real economy, and has important historical significance for the new round of e-commerce economic transformation. Meanwhile, as a gateway to the new economy, e-commerce live streaming has shown strong optimization effects in reducing costs, improving efficiency, and enhancing the experience from the perspectives of merchants, consumers, and even society. Although scholars have conducted various studies on e-commerce live streaming, there are few studies analyzing relevant research literature from a statistical perspective. Based on this background, this study used bibliometric method and adopted CiteSpace 6.1 R6 analysis software to analyze 201 literature related to "e-commerce live streaming" in Web of Science, revealing the research rules of scholars on this topic and providing important references for researchers to understand this field.

Keywords: E-commerce live streaming, Bibliometric method, Trends in paper publication, Keyword clustering analysis, Research on related topics.

1. Introduction

In recent years, due to the development of Internet technology and the popularization of mobile terminals, webcasting has gradually become the norm in social life, and has evolved into a new online business outlet. The live streaming promotes the authenticity, visualization and interactivity of online shopping. The live streaming focuses on the more detailed and vertical needs of consumers, attracts potential consumers, improves the conversion rate, and produces significant sales effects. Therefore, traditional e-commerce platforms such as AliExpress and Joybuy have launched live business activities one after another. Some international sellers, such as Walmart and Amazon.com, have also become aware of the benefits of livestreaming and have launched their own livestreaming commercial activities and platforms. Social media sites, such as Facebook and Instagram, have also incorporated more functions related to live streaming e-commerce. The academic research that accompanies live broadcast business practice also recognizes the importance of e-commerce live streaming. Although the relevant research time is still short, it is in a period of rapid growth. This article mainly reviews the publication trends, keyword clustering analysis, and related topic research of e-commerce live streaming.

2. Research Method

This section adopts the bibliometric method and uses the bibliometric tool software CiteSpace 6.1 R6 to conduct visual analysis on the relevant core literature. This part analyzes the

trend of literature publication, extracts keywords from literature titles, abstracts, keywords and citations, and then conducts keyword clustering and keyword emergence detection to explore the hot changes and development trends in international research on e-commerce anchors.

In order to have a more comprehensive understanding of the current academic research on the topic of "e-commerce live streaming", this section uses the core collection of the Web of Science database as the data source. On the Web of Science search page, use the advanced search method, the subject is "e-commerce live streaming" or "e-commerce live broadcasting", the document type is "article" or "review", the language is "English", and the publication time is not limited. By screening the literature and eliminating irrelevant literature and duplicate literature, a total of 201 published academic papers were finally identified for visual analysis.

3. Trends in Paper Publication

Scholars' research on "e-commerce live streaming" began in 2018, and the first scholar to study e-commerce live streaming was Li et al. (2018). The title is "Modelling the Roles of Cewebrity Trust and Platform Trust in Consumers' Propensity of Live-Streaming: An Extended TAM Method". The results of this study indicate that, both cewebrity trust and platform trust will greatly influence users' intention to reuse a certain platform. Moreover, results also indicate that cewebrity trust is far more important than platform trust. The annual publication status of scholars' research on "e-commerce live streaming" is shown in Figure 1.

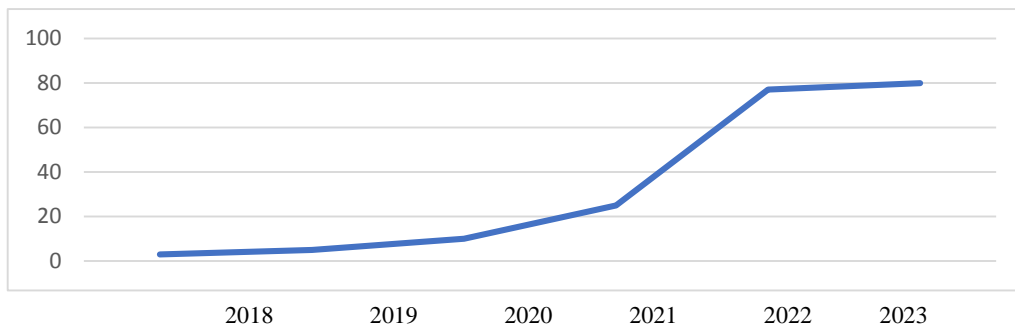


Figure 1. Web of Science Article Trend Chart on "E-commerce Live Streaming"

Note: This figure is drawn based on data accurately retrieved from the Web of Science database. The search was conducted on April 11th, 2024.

From the total number of literature, scholars have not published many articles on the research of "e-commerce live streaming", with a total of only 201 articles in the past six years. The number of articles published in the early stage was small, but it was in a stable growth stage. In 2022, the number of articles published increased significantly, reaching 77, and in 2023, it reached 80. This indicates that research on e-commerce live streaming has attracted the attention of many scholars since 2022.

From the perspective of national or regional distribution, research on "e-commerce live streaming" is mainly distributed in countries and regions such as the People's Republic of China, the United States, Taiwan, South Korea, Australia. Please refer to Table 1 for details.

Table 1. Statistical Table of Top 10 Countries/Regions for Web of Science Papers on "E-commerce Live Streaming"

Serial Number	Countries / Regions	Number	Proportion
1	PEOPLES R CHINA	92	50.00%
2	USA	27	14.67%
3	TAIWAN	12	6.52%
4	SOUTH KOREA	10	5.43%
5	AUSTRALIA	9	4.89%
6	ENGLAND	6	3.26%
7	CANADA	5	2.72%
8	FRANCE	4	2.17%
9	GERMANY	4	2.17%
10	THAILAND	4	2.17%

Note: This figure is drawn based on data accurately retrieved from the Web of Science database. The search was conducted on April 11th, 2024.

From the above table, it can be seen that China has the highest number of published papers in the world, with 92 papers accounting for 50.00%, followed by the United States with 27 papers accounting for 14.67%, while other countries have a relatively small proportion, each not exceeding 10%.

4. Keyword Clustering Analysis

Using CiteSpace 6.1.R6 software, 201 documents were analyzed. No setting a time range, Node Type as Keyword, algorithm as Log-Likelihood Ratio (LLR Logarithmic Maximum Likelihood Ratio), and keyword clustering map (as shown in the Figure 3) can be obtained. The Mean Silhouette value is an index to measure the homogeneity of the entire cluster members. The larger the value, the higher the similarity of the cluster members. The keyword co-occurrence map shows that there are 211 nodes and 918 connections, the network density is 0.0414, the Q value is 0.4929 (>0.3), and the MS value is 0.7869 (>0.7). These data show that the keyword cluster map has a reasonable structure and good homogeneity.

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 WoS: D:\文件资料\参考文献11_直播相关的论文\1.学位论文-博士论文\E-commerce live streaming\data
 Timespan: 2018-2023 (Slice Length=1)
 Selection Criteria: g-index (k=25), LRF=3.0, L/N=10, LBγ=5, α=1.0
 Network: N=211, E=519 (Density=0.0414)
 Largest CC: 204 (96%)
 Nodes Labeled: 1.0%
 Pruning: None
 Modularity Q=0.4929
 Weighted Mean Silhouette S=0.7869
 Harmonic Mean(Q, S)=0.6061

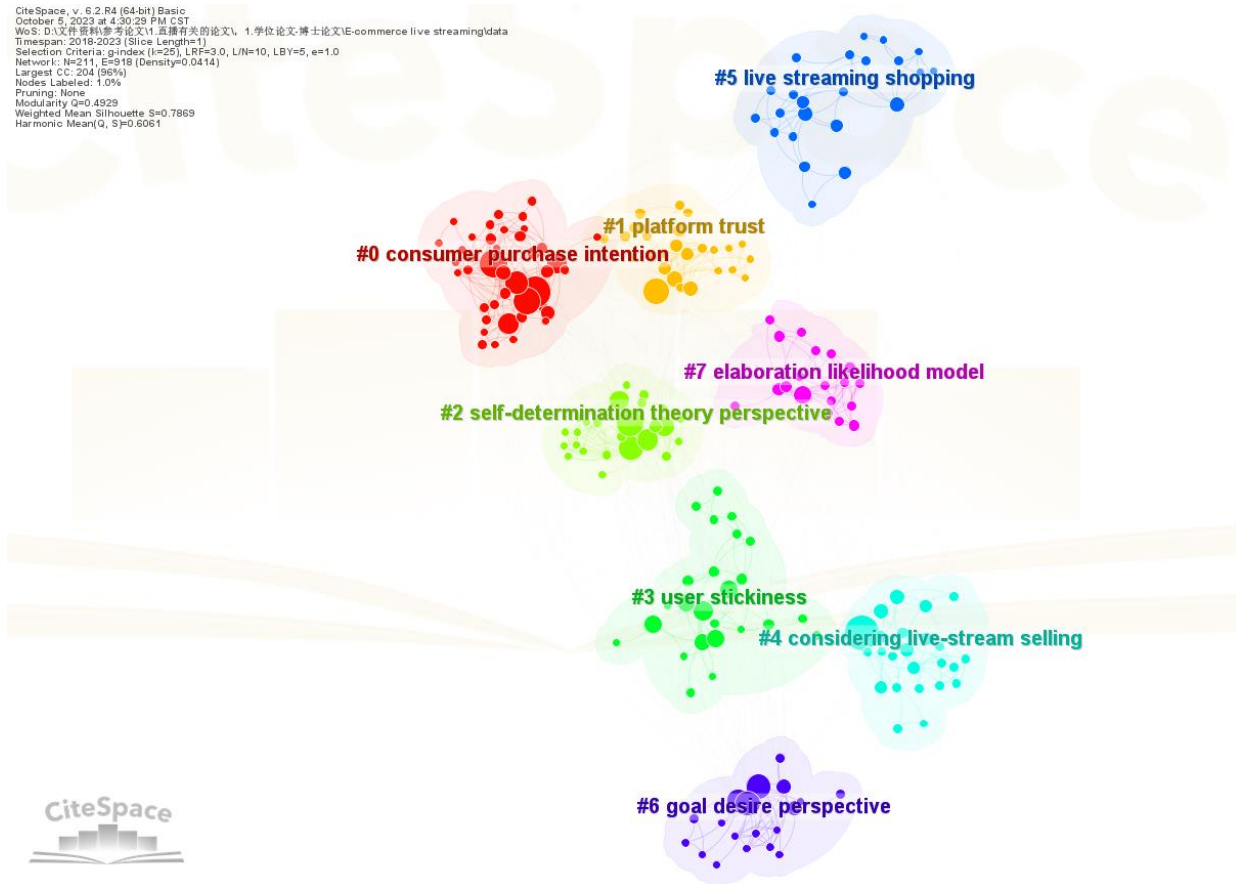


Figure 2. Keyword Clustering Map of E-commerce Live Streaming

Note: This figure is drawn based on data accurately retrieved from the Web of Science database. The search was conducted on April 11th, 2024.

From the above figure, it can be seen that the keywords of these 201 papers mainly focus on the following types of papers: consumer purchase intention, platform trust, self-determination theory perspective, user stickiness, considering live-stream selling, live streaming shopping, goal desire perspective, and elaboration likelihood model. The following will select the words with the highest concentration for research review.

In terms of consumer purchase intention, Guo et al. (2021) examined the influence of live streaming functionality on consumers' cross-border purchase intention from the perspectives of overall perceived value and overall perceived uncertainty. Liu et al. (2022) investigated the influence of tourism e-commerce live streaming functions (interactivity, authenticity, and entertainment) on consumers' purchase intention from the perspective of consumer traffic experience and trust; Dong et al. (2022) established a live streaming e-commerce evaluation system that includes information quality, system quality, service quality, telepresence, and social presence, proving that the quality of live streaming e-commerce in the five dimensions mentioned above is the standard and has a positive influence on green trust, thereby enhancing green purchasing intention. Liu et al. (2023) constructed a model of the influence of visibility, authenticity, and interactivity of live streaming platforms on consumer purchase intention, and explored the mediating role of trust in both. There are still many literature studies on e-commerce live streaming from the perspective of consumer purchase intention. Based on the data accurately retrieved from the Web of Science database on April 11, 2024, this researcher

conducted preliminary statistics and found that out of 201 studies on e-commerce live streaming, 72 studies focused on consumer purchase intention, accounting for 35.82%. It can be seen that in the research of e-commerce live streaming, studying from the perspective of consumer purchase intention is a hot topic and also a relatively important perspective.

In terms of platform trust, Liu et al. (2022) verified that the live streaming functions of tourism e-commerce (interactivity, authenticity, and entertainment) have a positive influence on consumers' traffic experience and trust, respectively; Both traffic experience and trust have a positive influence on consumers' willingness to purchase; The traffic experience and trust level play a mediating role in the relationship between the live streaming function of tourism e-commerce and consumer purchase intention. Dong et al. (2022) demonstrated that the quality of live streaming e-commerce has a positive influence on consumer trust, thereby enhancing purchasing intention. Lee et al. (2023) found that regardless of the food in the live broadcast, trustworthy influencers significantly affect consumers' perceived value, leading to impulsive buying and consumption. This indicates that in live streaming commerce, it is very important to create a sense of trust among consumers.

In terms of self-determination theory, Zhao et al. (2018) used self-determination theory to study the different motivations (i.e. intrinsic and extrinsic) that drive live streamers to continuously play videos on platforms. Wang et al. (2019) established a model based on self-determination theory to illustrate how social business characteristics affect consumer behavior and promote social business interests from the perspective of external motivation. Koe&Sakir (2020) used self-determination theory to determine the factors that influence entrepreneurs' motivation to adopt e-commerce.

This indicates that in the field of e-commerce live streaming research, self-determination theory is an important reference theory.

5. Research on Related Topics

At present, although the research on e-commerce live streaming is not rich, it shows a growing trend. Specifically, focus on the following aspects:

Research related to user (consumer) perception, attitude, and behavior. Haimson & Tang (2017) compared Facebook and Snapchat live broadcasts and found that immersion, immediacy, interactivity and sociality are important sources of attraction for users to watch live broadcasts. Yin (2020) verified that perceived usefulness, situational factors, and the behavior of following others significantly affect consumers' purchase intention, among which perceived usefulness has a relatively small influence. Based on the SOR theory, Liu et al. (2020) divided the characteristics of online live shopping into interactivity, authenticity, entertainment and visibility, and constructed a research model on the influence of online live shopping characteristics on consumer purchasing behavior. Zheng et al. (2021) based on the social presence theory and the SOR model, explored the influence of the overall social presence constructed from the three dimensions of consciousness, emotion and cognition in the context of live delivery with goods, and the influence on consumers' impulse purchase intention.

Research related to anchors. Qian & Li (2020) studied the characteristics of e-commerce anchors and the interaction between e-commerce anchors and audiences, and the results showed that the popularity, professionalism and product participation of e-commerce anchors are important characteristics to promote audience purchases. Ma (2021) believes that the products recommended by well-known internet celebrities are more likely to cater to consumers' self-presentation needs, and anchors are more likely to be considered as fashion trendsetters, which can better promote consumers' perceived enjoyment, social interaction and social presence. Fei & Zhou (2021) demonstrated the influence of different anchor types (traditional stars and web anchors) on consumer brand attitudes and purchase intention through behavioral experiments. Lu (2021) used econometric methods to prove that female anchors, government official anchors, and on-site picking scene live broadcasts have more influence on the development of fresh agricultural product e-commerce than male anchors, non-government official anchors, and off-site picking scene live broadcasts.

(3) Research related to live broadcast platform factors. Lu et al. (2018) found that the atmosphere of the live broadcast room, the novelty of the live broadcast, and the authenticity of the live broadcast have a significant influence on user attitudes and purchase intention. Gong et al. (2020a) based on the self-determination theory, explored its influence on consumers' impulsive purchases from the perspective of live broadcast platform design, and found a chain intermediary mechanism in which psychological ownership and self-efficacy exist. Gong et al. (2020b) explored the positive influence of live broadcast platform information content on consumers' impulsive purchases, and explored the mediating role of psychological distance and the moderating role of anchor admiration. Huang et al. (2021) based on the fine processing possibility model, proved that the characteristics of the live broadcast platform, as the central path, have a positive effect on the immersive experience and satisfaction

of consumers. Wang & Zhang (2020) summarized the basic concepts of scenario communication, starting from different perspectives such as communicators and users, analyzed the application practice of scenarios in the process of live streaming sales, proposed live streaming sales in the era of scenarios, reconstructed the connection between products, information, and users, and its essence is the migration of marketing paradigms driven by technology.

(4) Research related to the product. Chen & Lin (2018) pointed out that through the interaction with the anchor, consumers can know the product usage information actually displayed, so as to gain fun and experience. Chen et al. (2020) based on the refined processing possibility model, proved the influence of product quality and perceived anchor knowledge on consumers' purchase intention through questionnaire survey data of 545 consumers. Zhang et al. (2020) demonstrated that product type moderates the negative influence of live streaming on perceived uncertainty using quasi-experimental and two-experimental designs. Park & Lin (2020) based on the relevant research on celebrity endorsement and matching hypotheses, discussed that in the context of online shopping in China, the match between the anchor and the product affects the perceived attractiveness and credibility; the match between the anchor and the product content affects the utilitarian and hedonic attitude towards the content.

(5) Research related to the nature and development law of live e-commerce. Guo (2020) pointed out that as a new stage of e-commerce development, the gene of e-commerce live streaming is e-commerce, which essentially consumption is upgrading. The anchor is the key to achieving "product efficiency integration", and can improve transaction efficiency and brand loyalty by completely restructuring the "human-goods-scenes". Ma & Ding (2021) taking the number, sales and marketing potential of anchors in Tiktok as measurement indicators, selected 8 typical commodity industries as examples, and used spatial interpolation, spatial autocorrelation, Gini coefficient and other methods to analyze the spatial distribution characteristics of Tiktok live broadcast cargo level, and used geological detector model to analyze the influencing factors. Wang (2021) analyzed the characteristics of e-commerce live streaming from the perspectives of essence, behavioral logic, industrial logic, and trends, and pointed out that with the continuous improvement of industry standardization, the influence of e-commerce live streaming on industrial transformation, economic empowerment, and social influence will continue to strengthen. Zhao & Liang (2021) found through extensive literature review, practical research, observation, comparative analysis, and other research that the overall development of live streaming sales business models in the new era is characterized by diversification, mainly reflected in five aspects: diversification of anchors, diversification of categories, diversification of carrier forms, diversification of services, assistance to rural revitalization and national poverty alleviation; e-commerce live streaming currently faces severe challenges such as a lack of substantive innovation in services, worrying product quality, uneven anchor capabilities, blurred product category classification, lack of industry norms and standards, and blind spots in live streaming to assist farmers.

6. Conclusion

Through a review of existing literature, research on e-commerce live streaming has the following characteristics:

firstly, the research area is relatively concentrated, mainly in East and South Asian countries. For example, existing research mostly focuses on live streaming consumers in China, South Korea, and Thailand as samples. And e-commerce live streaming in China has developed the fastest and most representative. Secondly, there are differences in the research focus between China and the international community. China's research focuses more on qualitative analysis, analyzing the current situation, problems, and countermeasures of the live streaming commerce industry from a more macro perspective; However, international research focuses on empirical research, mostly focusing on the micro level of a specific factor.

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