

Applying Kano model to explore the quality requirements of Live Streaming of artistic performance with various Leisure Motivation

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Abstract

This study used the Kano model regression analysis to examine the degree of quality factors affecting the satisfaction of users of live streaming and to identify the attractiveness factors that influence users' preference for such content, in order to improve user satisfaction and meet appropriate consumer needs. The importance ranking of quality factors was found to be content > entertainment > uniqueness. The study also applied the leisure motivation theory model to investigate the differences in the classification of talent live streaming quality and user satisfaction evaluation among users with different leisure motivations. The results indicated that interactive exploratory users value the performers' multiple talents and interactive functions, emphasize personal characteristics and timely response to attention, which is in line with the characteristics of this group; learning-challenging users value the performers' professionalism, as well as the ability to improvise and display personal characteristics, in line with the group's preference for learning and challenging characteristics; stimulus avoidance users value the attribute qualities of healing and stress relief, humor and amusement, and pleasant mood, in line with their leisure motivation of stimulus avoidance.

Keywords: Live Streaming of artistic performance, Kano Model, Leisure Motivation Theory

1. Introduction

With the rapid development of digital technology and the fast pace of modern life, the amount of information received daily has increased dramatically, leading to increased life stress. Therefore, engaging in leisure activities during non-working hours is one of the ways for people to relieve stress and add interest to their lives. There are various types of leisure activities, and the Ministry of Education's "Leisure Education Implementation Plan" divides leisure activities into five categories: physical fitness, knowledge, entertainment, art, and service. Participating in music activities covers knowledge, entertainment, and art categories. According to the Ministry of Culture's (2020) statistics on cultural and artistic performances, the number of events for classical and traditional music, popular music, and rap reached as high as 7,566, second only to language and book categories. Among them, the number of personal performances in Taiwan or foreign cultural and artistic group activities is close to 220, indicating that performing

arts-related activities have great potential for development. Looking at the participation rate of the public in cultural and artistic activities, the participation rate in performing arts activities was 40% from 2018 to 2019, indicating that the public has a strong interest and willingness to participate in performing arts exhibitions.

A study indicates that in 2021, over 82% of global internet traffic was devoted to watching audiovisual programs (Yao-Guoqiang, 2021). The traditional way of watching and listening to programs, which creates celebrities and stars, lacks interaction and viewers can only regard idols as distant objects. However, live streaming breaks the limits of time and space, creating a mechanism for instant interaction with fans. Through chat rooms, fans can feel a sense of proximity to their idols, thereby enhancing their following. Compared to TV stars, internet celebrities and live streamers make people feel closer and more familiar. According to a survey by Creative Insight Market Research, the reasons why users watch live streams are entertainment, relaxation, and emotional

satisfaction, in addition to killing time and comforting themselves. Leisure and entertainment are also crucial factors. Nowadays, marketing tools have already followed changes in people's lifestyles

and communication technology (ICT), and live streaming has become a new corner of leisure and entertainment for people to visit and linger (Creative Insight Market Research, 2017).



Figure 1. The application of digital transformation models in performing arts to enter the live streaming industry
(Source: Central News Agency, 2020)

Iso-Ahola & Park (1989), believe that an individual's motivation for choosing leisure activities is influenced by their personal time, different growth backgrounds, and socialization processes, affecting their autonomous and more pleasant feelings towards themselves. Motivation also changes over time, and at times, an individual's past leisure activity experiences can influence unplanned leisure motivations and change the motivation for participating in a particular leisure activity. Mannell & Kleier (1997) argue that whether their needs are met will affect their leisure needs and motivations, thus affecting leisure behavior. This interactive effect creates a dynamic leisure satisfaction feedback model. To understand the feelings and satisfaction levels of the audience for talent-based live streaming in their leisure motivations and the possible benefits they may receive, a deeper investigation is necessary.

Due to the lack of literature related to the user experience and benefits of live streaming for talent-based performances in Taiwan, as well as the rapid development of online live streaming in recent years and its impact by the pandemic, online live streaming has become one of the industries that has developed rapidly. Facing the changing times and the needs of different users, the live streaming industry is the main driver for the creation of personalized program content quality. Therefore, this study focuses on the experiences and benefits of the public

participants in talent-based live streaming as a reference for the development and adjustment of different types of live streaming industries and practitioners. Through data analysis and literature review, Kano analysis results were used as the research basis, and evaluation categories were redefined based on the evaluation items, and an appropriate evaluation scale for different leisure motivation users participating in talent-based live streaming was developed to understand which factors can meet consumers' expectations, thereby attracting more potential consumers and injecting inspiration and guidance for emerging performance industries.

2. Literature Review

2.1 Live Streaming of artistic performance

With the advent of the era of self-media, online communities have become an indispensable element of modern life, and "live streaming with online interaction" has become increasingly popular in recent years during the self-media wave. Starting from sports events, game streaming, news broadcasting to now covering a diverse range of content, live streaming platforms have multiplied, including native streaming platforms and other social media platforms such as Instagram, Line, Facebook, etc., which have improved their capabilities to support live streaming. This allows users to watch

their desired live streaming programs on any device at any time. The following is a list of live streaming content categories.

Table 1. Description of Live Streaming types

Content type	Definition
Sports events	Various sports competitions, ball games, racing competitions, etc.
Gaming live streaming	Share game screen recording through mobile or computer and broadcast it live.
News reporting	Live coverage, or display of TV news content for public interaction and comments.
Lifestyle sharing	Daily events, including unboxing, cooking, makeup, pets, sponsored content, etc.
Talent performance	Showcase personal talents through the platform, mostly singing, dancing, instruments, magic, and variety shows.
E-commerce auctions	Merchants promote their products through the host and interact with the audience, increasing purchase intention.
Event promotion	For corporate events, such as product launches, allowing viewers to participate in the company's on-site activities.

Data source: Collected by this study.

In recent years, in response to the impact of the COVID-19 pandemic, performing groups both domestically and internationally have turned to online live streaming. However, most of the content consists of pre-recorded videos or tutorial videos without any interaction, similar to watching a documentary. Compared to other more interactive live streaming models, viewers are naturally less willing to pay for this type of content. Furthermore, for performing groups, online live streaming is

different from individuals using their phones to go live, as it requires funding, equipment, planning, and other aspects that are not any less than a live performance. Therefore, the concept of "non-interactive" live streaming and "growing followers" without community management faces many challenges, whether it is to alleviate the impact of the pandemic through live streaming or to generate profits through it. These challenges require further exploration.



Figure 2. Various types of live performance streaming.

Table 2. Related Literature on Live Streaming

Author	Title	Focus	Theory/Literature
Yang, Wan-Ling (2020)	An Evaluation of Short Video and Live Streaming on Social Media and Live Streaming Platforms: Behavior and Context	Descriptive Statistical Analysis Multivariate Treatment Effect Models	New Media and Social Video
Wang, Shu-Ho (2022)	The Influences of Live Streaming Concert Service Content, Publicity and Promotion Toward Ticket Purchase Intention	Survey Research Factor Analysis Descriptive Statistical Analysis One-way Analysis of Variance (ANOVA)	Online Live Concert Service Content Promotional Methods Purchase Intentions
Hsu, Tzu-Yun (2021)	Digital Generation—Exploration of Live Broadcasting and Internet Behavior	Descriptive Statistics Analysis of Variance	Satisfaction Theory Enrichment Theory Peer Effect Theory Diffusion Theory
CHEN, WEN-CHIH (2021)	Exploring the Factors Influenceing Consumer Engagement in Livestream Platform Type under the COVID-19 Pandemic	Structural Equation Models	Perceived Ease of Use Perceived Interactivity Perceived Value Consumer Participation

WANG, LING-YUN (2020)	University Students' Peceptions toward Live Streaming: the Relationship among Perceived Usefulness, Streamer Style and Audience Satisfaction	Data Analysis Method Perceived Usefulness Scale Satisfaction Scale Live Streamer Style Scale	Online Live Streaming Perceived Usefulness of Live Streaming Live Streamer Style Viewing Satisfaction
shih yahui (2022)	The study regarding the personality traits of online live-streaming, stickiness and donating	Descriptive Statistical Analysis Hypothesis Testing Analysis" Regression Analysis	Personality Traits Stickiness Tipping Behavior
TANG, YUNG-HSIAO (2021)	Live webcast under the COVID-19 epidemicApplication development discussion	Case Study Method	Overview of Live Streaming" Use of New Communication Technology" Satisfaction Research

content depth, unique talents, and performance style as angles for analysis, nor any that extracts the charismatic factors from successful cases for study.

Therefore, the focus of this study is mainly on the internet interactive live streaming platforms that have become popular since 2017. According to the study by Chen, N. C., Huang, J. H., Chen, J. Z., (2022)., In recent years, many well-known performing groups in Taiwan have joined the ecosystem of interactive live streaming, signing cooperation agreements with live streaming platforms through their management companies. They package amateur performers using the packaging techniques of celebrity artists according to their different colors and specialties, and observe daily data and analyze customer sources to understand consumer preferences. Based on widely popular topics or trends among consumers, they create content for future live streaming or live performances as a reference and have created many Performer live streamer with income exceeding tens of millions.

The related literature on interactive internet live streaming is organized as shown in Table 2. This research uses the following contents as the foundation for the strategy of digital transformation in the performance industry. Topics such as the fan economy, community management, and business models for platform marketing are now essential marketing focuses that cannot be ignored by various industries. However, most of these literature base their theories on emotional psychology, purchase intention, subscription motivation, and personality traits. They pay less attention to the impact of live stream content quality on user satisfaction, and how to enhance the factors of the live streamer's charm and professional value. Furthermore, there is no research that uses the live streamer's professionalism,



Figure 3. The accumulated revenue has exceeded 10 million Taiwan dollars
Data source: "Lan Live - " Zaya Live Streamer (search date: 20220430).

2.2 Leisure Motivation

Motivation is an internal process that causes an individual to engage in or maintain an activity, directing it towards a specific goal (Chun-hsing Chang, 1987; Loudo & Bitta, 1993). Leisure motivation can include intrinsic motivation, which refers to an individual's pursuit of leisure activities for their own enjoyment, creating psychological desires or needs that drive the individual's behavior, and extrinsic motivation, which is influenced by external factors or a quality that is attributable to others (Iso-Ahola, 1989; Losier & Bourqu, 1993). Forbes (2011) suggests that motivation is the primary factor that drives an individual's behavior, as thoughts can influence behavior. IsoAhola (1989) believes that motivation is influenced by an individual's time, different backgrounds, and socialization process, affecting an individual's choice of leisure activities for a more autonomous and enjoyable experience. Motivation also changes over time, and an individual's past leisure experiences can impact their unplanned leisure motivation and change their original motivation to participate in a particular leisure activity. Deci (1975) proposed the theory of intrinsic motivation, which promotes the continued occurrence of a behavior, providing a feeling of happiness for the individual. Iso-Ahola (1982) studied leisure motivation in social psychology and found that it often involves two behavioral characteristics: pursuit and avoidance. Pursuit refers

to an individual's pursuit of self-affirmation or self-fulfillment, such as seeking social recognition or seeking social interaction, while avoidance can be divided into individual and group levels, such as pursuing self-relaxation, avoiding personal setbacks, or avoiding contact with others.

Beard & Ragheb (1983) pointed out that the main motivation for participating in leisure activities is to release physical and mental stress, to achieve physical and mental comfort, and they developed a theoretical model of leisure motivation and compiled a leisure motivation scale. They believe that leisure motivation can be divided into four levels, including Intellectual, Social, Competence-Mastery, and Stimulus-Avoidance. The leisure motivation scale they proposed is the most complete in recent years and has good reliability, validity, and consistency through non-homogeneous group experiments. This scale is currently the most commonly used leisure motivation scale, and scholars at home and abroad have used this scale as the basis for research, and it has been supported in non-homogeneous, cultural empirical testing (Lounsbury & Polik, 1992; Munchua-Delisle & Reddon, 2005; Starzyk, Reddon & Friel, 2000). Therefore, this study also refers to the LAS scale established by Beard & Ragheb (1983), which includes the four dimensions of Intellectual, Entertainment, Competence-Mastery, and Stimulus-Avoidance, for further discussion and analysis. The study incorporates the definition of

leisure motivation proposed by Beard & Ragheb, as referenced by both domestic and foreign scholars in

recent years, and applies it to related research as summarized in Table 4.

Table 3. Definition and Measurement Items of Leisure Motivation

Dimension	Content	Question items
Intellectual Factor	Individuals engage in mental activities related to learning, exploration, discovery, creation, imagination, etc. according to their intellectual motivations.	<ol style="list-style-type: none"> 1. To learn about the things around oneself 2. To satisfy curiosity 3. To explore new ideas 4. To gain self-knowledge 5. To expand one's knowledge domain 6. To discover new things 7. To enhance creativity
Social Factor	Individuals engage in leisure activities for social reasons. This dimension includes two basic needs: the need to make friends and establish relationships, and the need to gain respect from others.	<ol style="list-style-type: none"> 1. For interacting with others 2. For finding companionship 3. For building friendships 4. For expressing one's thoughts, feelings, or talents to others 5. For showcasing one's abilities to others 6. For seeking a sense of belonging 7. For gaining respect from others
Competence/ Mastery Factor	Individuals engage in leisure activities for the purpose of challenging themselves, achieving mastery, competence, and competition.	<ol style="list-style-type: none"> 1. For the purpose of feeling pleasure or enjoyment. 2. For the purpose of improving work ability. 3. For the purpose of feeling more energetic. 4. For the purpose of developing skills and abilities. 5. For the purpose of maintaining physical and mental health. 6. Viewed as a challenge to one's own abilities.

Stimulus/ Avoidance Factor	Individuals avoid or escape from an overstimulating life. Some people need to avoid social contact, seek peace or tranquility, while others need to rest and relax themselves.	<ol style="list-style-type: none"> 1. For the purpose of being alone 2. For the purpose of providing physical relief 3. For the purpose of escaping from the fast-paced life 4. For the purpose of resting 5. For the purpose of reducing stress and tension 6. For the purpose of alleviating time pressure 7. For the purpose of slowing down the pace of life
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Source: This study is based on Beard & Ragheb (1983).

Table 4. Literature on leisure motivation by domestic and international scholars

Author	Leisure Motivation
Lin Yi-Jun (2021):	<ol style="list-style-type: none"> 1. Enhancing Intelligence 2. Establishing Social Connections 3. Stimulus Avoidance
Luo Hui-Mei (2021):	<ol style="list-style-type: none"> 1. Intellectual 2. Social 3. Challenge-Mastery 4. Stimulus-Avoidance
TuYue-Ying (2021):	<ol style="list-style-type: none"> 1. Psychological Pleasure 2. Social Belonging 3. Physical Health
Cheng Yu-Ming (2020):	<ol style="list-style-type: none"> 1. Intellectual 2. Social 3. Challenge-Mastery 4. Stimulus-Avoidance
Nasra Shoka Kara, Kezia Herman Mkwizu (2020):	<ol style="list-style-type: none"> 1. Intellectual 2. Social 3. Challenge-Mastery 4. Stimulus-Avoidance

2.3 Kano Model

2.3.1 Concept of Kano Model

Kano Model was proposed by Noriaki Kano in

1995, who believed that people tend to focus more on the "physical aspect" of quality, while the related concept of quality in the "psychological aspect" and the One-dimensional of quality are more likely to be

overlooked. Therefore, Kano proposed a "two-dimensional quality model". As shown in Figure 4, the horizontal axis represents the degree of adequacy of "quality", and the vertical axis represents satisfaction. The five curves respectively represent the quality relationship of the "Kano

Quality Model". By judging the quality, one can better understand the relationship between various quality, performance, and satisfaction and develop important quality items that can effectively improve customer satisfaction. The segments are described in detail in Table 5.

Table 5. Kano Model Elements Definition Table

Quality Element	Definition
Must-be/Basic/Essential	When the quality element is sufficient, consumers feel it is a matter of course and do not feel particularly satisfied. However, if the quality element is insufficient, consumers will be dissatisfied.
One-dimensional/Performance	When this quality element is sufficient, consumers will feel satisfied and when it is insufficient, it will cause dissatisfaction. The level of satisfaction will increase or decrease with the degree of provision. Therefore, efforts should be made to provide this quality element as much as possible, so that the more sufficient the quality is, the more satisfied consumers will feel.
Attractive	Attractive quality can be used as a weapon for product differentiation. Attractive quality elements refer to the quality requirements that go beyond satisfying the basic needs of consumers, and when sufficient resources are still available to meet such quality requirements, providing such quality elements can exceed the expectations of consumers and greatly enhance their satisfaction.
Indifferent	A quality element that does not affect customer satisfaction, whether it is sufficient or insufficient, is a quality element that customers do not care about.
Reverse	When this quality element is sufficient, it will cause dissatisfaction instead of satisfaction to consumers. However, when this quality element is insufficient, it will cause satisfaction instead of dissatisfaction to consumers.

Source: Kano (1984)

Several scholars (Jane & Dominguez, 2003; Tan & Pawitra, 2001; Matzler & Hinterhuber, 1998; Vasilash, 1995) have explicitly stated the advantages of the Kano Model in the context of application development and design. These advantages include:

- (1) Allowing businesses to better understand the needs of their products or industries, and appropriately define the characteristics of consumer goods that will enhance user satisfaction, which can aid in the pre-development stage of product development.
- (2) Providing decision-makers with a set of measurement criteria for balancing design and prioritizing attributes that have the greatest potential to increase user satisfaction. This can be especially helpful for businesses facing limited

resources and technological limitations when it comes to satisfying quality requirements.

- (3) Identifying different needs from attractive, one-dimensional, and necessary qualities, in order to differentiate between different consumers and tailor their products to meet the specific needs of their customers. This can help improve overall satisfaction levels.
- (4) The Kano Model can help identify and satisfy attractive needs, which is a critical factor in outcompeting rivals in the industry chain, and can lead to differentiating product characteristics being developed into strategies.
- (5) The Kano Model is beneficial in establishing high-value prerequisites and importance rankings in the product development process, and can be

used to construct unique quality characteristics for user satisfaction. Over time, there is a chance that consumer goods or industrial services with attractive quality attributes can be developed into consumer goods or industrial services with necessary quality attributes (Shen, Tan & Xie, 2000). In the current competitive industry

environment, industries need to constantly develop novel products and innovative industrial services to attract consumers and expand the use of Kano model and quality function deployment (QFD), which can be used in conjunction with each other (Govers, 1996; Matzler & Hinterhuber, 1998).

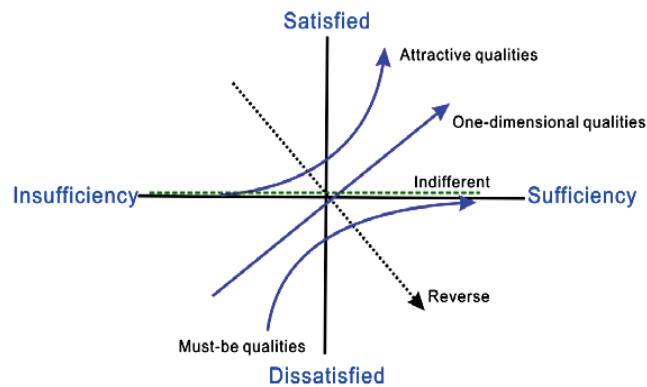


Figure 4. Relationship between quality performance and satisfaction in Kano Model
(Data source: Kano et al.,1984)

2.3.2 Kano Model Quality Attribute Assessment

To classify attributes into Kano types of quality, Ting and Chen developed a regression model to assess the impact of a quality attribute on customer satisfaction (Ting&Chen,2002). The common method of using "regression analysis" to determine "quality attributes" is to divide "quality" into "sufficient quality" and "insufficient quality" and correspond to the "regression equation" using "regression coefficients" and "significance" to determine "quality attributes." The "regression equation" is as follows (Ting & Chen, 2002):

$$P = C + \beta_1 \times K_n + \beta_2 \times K_p$$

In this "regression equation", P is "satisfaction", C is a constant term, K_n is the degree of "insufficient quality", K_p is the degree of "sufficient quality", and

β_1 and β_2 are their coefficients. In the questionnaire survey, K_n and K_p are usually scored within the range of -3 to +3, and P is also scored within the same range. In this "linear" regression equation, individual "quality evaluations" must be divided into K_n and K_p . When the value of "quality evaluation" is "positive" (e.g. 3), $K_n=0$ and $K_p=3$; when the value of "quality evaluation" is "negative" (e.g. -2), $K_n=-K_n=2$, and $K_p=0$. By the significant relationship between β_1 and β_2 , the "quality attributes" of each "quality" can be known. The relationship is shown in Table 6.

Table 6. Relationship between regression coefficient significance and quality attributes.

Quality Element	β_1 (backward) Sig.	β_2 (forward) Sig.	Remark
Attractive	n.s.		$\beta_1=0 ; \beta_2 > 0$
One-dimensional	*	*	$\beta_1 < 0 ; \beta_2 > 0$
Must-be	*	n.s.	$\beta_1 < 0 ; \beta_2 = 0$
Indifferent	n.s.	n.s.	$\beta_1=0 ; \beta_2=0$
Reverse	*	*	$\beta_1 > 0 ; \beta_2 < 0$

($p < .05$ indicates significance; n.s.: not significant; *: significant)

In this model, the meanings of β_1 and β_2 can be divided into several points:

- (1) Comparing the absolute values of β_1 and β_2 , the highest one indicates the greatest impact on "satisfaction".
- (2) From the positive or negative β_1 and β_2 , it can be determined whether there is a "positive" or "inverse" relationship between "quality" and "satisfaction". Usually, β_1 is negative and β_2 is positive, indicating a "positive" relationship between them. (Positive relationship: the stronger the "quality", the greater the "satisfaction"; inverse relationship: the stronger the "quality", the lower the "satisfaction").
- (3) The different sizes and meanings of β_1 and β_2 indicate an "asymmetric" relationship between the presence or absence of "quality" and its impact on "satisfaction". Based on the results of regression analysis, the significance of the regression coefficients β_1 and β_2 can be evaluated to classify quality. Table 6 lists the Kano quality classification criteria.

This study effectively classified the quality attributes of each experiential factor using the Kano model, which can help understand the differences between the "essential" and "degree" of different factors and the impact of each experiential factor on consumer satisfaction. The Kano quality model provides a set of classification methods that provide a new way to analyze during product design, development, or positioning, making control over "design quality" and "satisfaction" more precise. However, in the Kano quality judgment method, the reliability of the quality judgment decision matrix must be considered, so this study will adopt the judgment method of "regression analysis".

3. Research Design

The measurement tools used in the study include the "Design Quality Performance and Satisfaction Evaluation of Performance Live Streaming" and the "Leisure Motivation Scale" for users of Performance live streaming. Regarding the determination of the design quality of Live Streaming of Performance, the study first refers to relevant literature on the attractiveness and quality factors of online interactive Live Streaming of Performance (Chen, Huang, & Chen, 2022), further explores the literature, and continues to design questionnaire evaluation items. Three live streamers with more than five years of practical experience and two live streaming agency agents, managers, and art directors with more than five years of experience in live program design were then invited to conduct a focus group discussion, and 15 quality evaluation items were finally determined, as shown in Table 7.

Table 7. Quality factor analysis of Live Streaming of Performance

The evaluation scale uses a 5-point Likert scale, where the left side represents negative quality, -2 and -1 represent the degree of Feature Requirement Not Fulfilled; on the contrary, the right side represents positive quality, 2 and 1 represent the degree of Feature Requirement Fulfilled. The above 15 samples were evaluated accordingly. At the same time, the overall satisfaction of live streaming is also evaluated using a 5-point Likert scale, where 1 represents the lowest level of satisfaction and 5 represents the highest level of satisfaction. Regarding leisure motivation, the study refers to the Leisure Attitude Scale (LAS) constructed by Beard & Ragheb (1983), which is divided into four dimensions: intellectual, entertainment, competency mastery, and stimulation avoidance. This study uses 27 variables from the scale to interpret the leisure motivations of live streaming users, and the variable summary is shown in Table 13. The study uses a 5-point semantic differential scale for the questionnaire, in which the respondents themselves personally agree or disagree with each leisure motivation description item to measure their own leisure motivation characteristics. The study mainly explores the correlation between the design quality evaluation of Performance live streaming and the satisfaction of live streaming users. Therefore, the respondents are users who have watched Performance live streaming, a total of 127 (including 64 men and 64 women, and age distribution is between 12-39 years old).

4. Discussion

4.1 The Correlation between Quality Attributes Evaluation and Satisfaction of Live Streaming of Performance.

4.1.1 Factor analysis

First, the ratings of the 127 participants on each quality attribute were averaged, and factor analysis was performed using these average values. This study used Bartlett's test of sphericity and the measure of sampling adequacy (MSA) for factor analysis. The result of the Bartlett's test of sphericity reached a significant level ($P < .001$), and the MSA test showed a Kaiser-Meyer-Olkin (KMO) coefficient of about 0.91, indicating good sample adequacy of measuring users' experience quality perception provided by social networking sites in this study. Based on principal component analysis, three factors were extracted with eigenvalues greater than 1. The factor loadings obtained after rotation using the varimax orthogonal rotation method are shown in Table 7.

Quality Attributes	Factor 1	Factor 2	Factor 3
Q10 Performer live streamers demonstrate high levels of professionalism.	.811	.123	.237
Q11 Performer live streamers are multi-talented	.754	.161	.254
Q14 Live Streaming of Performance is therapeutic and stress-relieving.	.732	.380	.184
Q8 Performer live streamer is humorous and witty.	.596	.384	.182
Q6 Watching Live Streaming of Performance brings me joy.	.585	.551	.225
Q9 Live Streaming of Performance features improvisational performances.	.575	.280	.319
Q7 Live Streaming of Performance provides the latest trending information.	.563	.475	.268
Q4 Performer live streamer has an attractive appearance.	.120	.837	.252
Q12 Performer live streamers respond to fans' attention at any time.	.310	.757	.171
Q13 Live Streaming of Performance provides entertainment functions.	.385	.701	.281
Q15 Performer live streamer can provide on-demand programs.	.277	.619	.402
Q2 Live Streaming of Performance can accompany daily.	.583	.592	.122
Q1 Performer live streamers have unique personal styles.	.238	.192	.776
Q5 The visuals of Live Streaming of Performance have a sense of design.	.162	.361	.756
Q3 Memorable Live Streaming of Performance.	.429	.193	.736
Eigenvalue	4.05	3.65	2.48
Explained variance (%)	26.98	24.30	16.50
Cumulative explained variance (%)	26.98	51.28	67.78

The three factors obtained from factor analysis explain 26.98%, 24.30%, 16.50% of the variation, respectively, and the cumulative explained variance is 67.78%. Based on the adjective meanings of each factor, they were named as follows: the first factor primarily reflects the sensory needs of live streaming users, named as the Content factor; the second factor represents the social needs between users and Performer live streamers, named as the Entertainment factor; the third factor mainly reflects the demand for Performer live streamer's personal creativity and uniqueness, named as the Uniqueness factor.

To investigate the correlation between user

satisfaction with Live Streaming of Performance and factor scores, multiple linear regression analysis was conducted. Using the scores of the three factors as independent variables and the satisfaction rating as the dependent variable for 15 questionnaire items, a backward regression was performed to obtain the multiple regression equation for satisfaction and the three factors. The results are shown in Table 8. The coefficients for the Content factor (Factor 1), Entertainment factor (Factor 2), and Uniqueness factor (Factor 3) are 0.365, 0.197, and 0.200, respectively, and all have a positive effect on satisfaction. Specifically, the Content factor has a higher impact on user satisfaction compared to the other factors.

Table 8. Multiple linear regression analysis of factor scores and satisfaction.

Model	B	β	T-value	Sig.	Quality
Constant	4.375		69.440	.00	
Content	.280	.365	4.433	.00	O

Entertainment	.151	.197	2.386	.00	M
Uniqueness	.153	.200	2.424	.00	O

4.1.2 Kano Model of Quality

The study further investigates the impact of each quality item on satisfaction for Performer live streamers. The analysis method is based on Kano "regression analysis" (Ting & Chen, 2002). The regression analysis of each quality item refers to

Table 6, and judges the "Kano quality attribute" of each quality item based on whether β_1 , β_2 are significant and the positive or negative value of the number. Among them, M is "must-be quality", O is "one-dimensional quality", A is "attractive quality", I is "indifferent quality", and R is "reverse quality". The results are shown in the right column of Table 9.

Table 9. Kano quality classification results for the quality attributes of Live Streaming of Performance

Construct	Attributes	β_1	sig.	β_2	sig.	R2	Quality
Content	Q10	-.205	.059	.285	.004	.185	A
	Q11	-.232	.015	.212	.026	.140	O
	Q14	-.396	.000	.021	.833	.325	M
	Q8	-.271	.004	.255	.007	.203	O
	Q6	-.376	.000	.197	.030	.247	O
	Q9	-.401	.000	.237	.012	.165	O
	Q7	-.364	.000	.156	.108	.216	M
Entertainment	Q4	-.068	.543	.207	.044	.064	A
	Q12	-.222	.024	0.221	.025	.145	O
	Q13	-.365	.000	.137	.141	.195	M
	Q15	-.368	.000	.138	.147	.453	M
	Q2	-.342	.001	.0105	.294	.166	M
Uniqueness	Q1	-0.385	.000	.048	.645	.172	M
	Q5	-0.294	.002	.181	.044	.163	O
	Q3	-0.322	.001	.240	.010	.235	O

The results showed that the quality items of the Content factor (Factor 1), "Live Streaming of Performance is therapeutic and stress-relieving." and "Live Streaming of Performance provides the latest trending information." were classified as "Must-be quality," indicating that the designer must maintain a certain level of performance for these quality items, but increasing the standard cannot significantly improve the satisfaction of the live streaming users.

"Performer live streamers demonstrate high levels of professionalism." was classified as "Attractive quality," which explains that if a performer's talent is very professional, it can greatly improve satisfaction, but the absence of this quality item will not cause dissatisfaction among users. The quality attributes of the Content factor, such as "Performer live streamers are multi-talented," "Performer live streamer is humorous and witty," "Watching Live Streaming of

Performance brings me joy," and "Live Streaming of Performance features improvisational performances," were classified as "One-dimensional quality," indicating that the performance and satisfaction between positive quality attributes and users show a linear relationship. When positive quality attributes improve, user satisfaction will also increase. For the Entertainment factor (Factor 2), except for "Performer live streamers respond to fans' attention at any time." which was classified as "One-dimensional quality," and "Performer live streamer has an attractive appearance." classified as "Attractive quality," the rest were classified as "Must-be quality," including "Live Streaming of Performance provides entertainment functions," "Performer live streamer can provide on-demand programs," and "Live Streaming of Performance can accompany daily." That is, for live streaming users, the entertainment effect and daily companionship of Live Streaming of Performance are essential qualities that must be possessed, otherwise it may lead to reverse effects. However, the further improvement of these qualities cannot effectively increase consumer satisfaction. As mentioned earlier, these quality items have a more severe impact on low user satisfaction,

but have no significant effect on high user satisfaction. In terms of design management, this means that these quality items are basic and necessary characteristics, so design developers must maintain their level of performance and sufficiency without pursuing high levels and wasting development resources. In the Uniqueness factor (Factor 3), "The visuals of Live Streaming of Performance have a sense of design." and "Memorable Live Streaming of Performance." were classified as "One-dimensional quality," and "Performer live streamers have unique personal styles." was determined as "Must-be quality," indicating that user satisfaction with live streaming increases as the uniqueness of the performance improves.

Table 9 displays the Kano quality classification results of the quality items for each factor, which have similar trends. Therefore, this study further applies the Kano regression analysis model to explore the correlation between the three factors and satisfaction. Linear model analysis is performed with satisfaction as the dependent variable and factor scores as the independent variables. The results are shown in Table 10.

Table 10. Kano Model quality classification results of Live Streaming of Performance quality factors.

Affective factor		β_1	p	β_2	p	R2	Quality
Content	Factor 1	-.192	.030	.315	.000	.260	O
Entertainment	Factor 2	-.407	.000	.103	.228	.396	M
Uniqueness	Factor 3	-.182	.044	.190	.035	.173	O

The Content Factor (Factor 1) and Unique Factor (Factor 2) were classified as One-dimensional quality, while the Entertainment Factor was classified as Must-be quality. This analysis result is similar to the previous result, indicating that the quality requirements of direct-to-design for live streamers emphasize the emotional quality brought by live streaming, as well as the performance of the visual and sound design. Sufficient quality in these aspects can enhance user satisfaction. On the other hand, the Entertainment Factor is a Must-be quality that has a significant impact on satisfaction but only needs to meet the level of quality that users can accept, without over-supply or emphasis.

4.1.3 Experience attribute validation

To verify the correlation between different sensory attributes and user preference, a study was conducted by convening a panel of experts, including three live streamers with more than five years of experience, and two managers or art directors from live streaming agencies with more than five years of experience. The experts discussed and evaluated the relationship between sensory attributes and user preference based on the number of followers of the performers in Lan-Live Live Streaming of Performance, with a focus on instrument performance as the main area of expertise, as shown in Table 11.

Table 11. Performer live streamer (2022.07.08)

Liz , 430,000 followers	Kate , 210,000 followers	Zaya , 160,000 followers

Data source: Screenshots and data collected from Lang Live platform on 2022.07.08.

High follower count case: Liz, with 430,000 followers, has a significant relationship with the three major constructs in the Kano regression analysis. This includes factors such as "Performer live streamers have unique personal styles", "Live Streaming of Performance can accompany daily life", "Performer live streamers respond to fans' attention at any time", "Performer live streamer can provide on-demand programs", "Live Streaming of Performance provides entertainment functions", and other experiential factors that belong to the three major constructs. Therefore, Liz's live streaming as a Performer includes both the content and entertainment aspects. In addition, Liz's Performer live streaming also includes 14 other factors such as "Watching Live Streaming of Performance brings me joy", "Performer live streamer is humorous and witty", "Performer live streamers are multi-talented", and "Live Streaming of Performance provides the latest trending information", with a wide coverage as shown in Table 12.

Case study with medium level of followers: Kate, with 210,000 followers, includes experience factors such as "Live Streaming of Performance is

therapeutic and stress-relieving," "Performer live streamers respond to fans' attention at any time," "Performer live streamers demonstrate high levels of professionalism," "Performer live streamers are multi-talented," which belong to the content and uniqueness dimensions (One-dimensional). In addition, Kate includes 13 factors, as shown in Table 12.

Case study with low level of followers: Zaya, with 160,000 followers, includes experience factors such as "Performer live streamers demonstrate high levels of professionalism" and "Performer live streamers are multi-talented," which belong to the content dimension, but lacks many factors related to entertainment dimension, such as "Live Streaming of Performance can accompany daily," "Live Streaming of Performance provides entertainment functions," "Live Streaming of Performance is therapeutic and stress-relieving," and "Performer live streamers respond to fans' attention at any time," which are categorized as attractive and One-dimensional experience elements. In addition, Zaya includes 11 factors, as shown in Table 12.

Table 12. Performer live streamer (2022.11.05)

Evaluation criteria	High	Medium	Low
Case study			

		Liz 430,000 followers	Kate 210,000 followers	Zaya 160,000 followers
Expertise		Singing and dancing	Music performance	Variety show
Content	Q10	●	●	●
	Q1	●	●	●
	Q14	●	●	×
	Q8	●	×	●
	Q6	●	●	●
	Q9	●	●	●
	Q7	●	●	●
Entertainment	Q4	●	●	●
	Q12	●	●	×
	Q13	●	×	×
	Q15	●	●	●
	Q2	●	●	×
Uniqueness	Q1	●	●	●
	Q5	×	●	●
	Q3	●	●	●

4.2 Comparison of users with different leisure motives.

4.2.1 Factor analysis of leisure motives

A total of 27 questionnaire items were used for leisure motivation factor analysis. The overall data sample was found to be appropriate for factor analysis, with a KMO value of 0.93 and a Bartlett's test of sphericity p-value less than 0.001, indicating a significant level of correlation. In this study, principal component analysis was used to select factors. The number of factors was determined based on the criterion that eigenvalues were greater than 1, supplemented by scree plot judgment. Four common

factors were selected, which could explain about 70% of the total variance. To name and interpret the selected factors, the maximum variance axis method was used to rotate the factor axis. The choice of factor loadings after rotation was based on the suggestion by Hair et al. (1998), in which all variables with loadings greater than 0.5 were used to name the factor dimensions. Similarly, according to the Cronbach's alpha test results, all four leisure motivation factor dimensions had alpha values greater than 0.7, indicating that each variable within the four factors had stable consistency, reliability, and reference value. The loadings, eigenvalues, reliability, and component organization of each factor are shown in Table 13.

Table 13. Factor analysis of leisure motivation

FS	FC	OS	FL	EV	% of variance	Cumulative of %	α
Stimulus Avoidance	Reduce stress and tension	Stimulus Avoidance type	.871	6.337	63.373	63.373	0.902
	Escape from		.853				

	busy life						
	Reduce tight schedule			.850			
	Slow down life pace			.844			
	Provide physical comfort			.813			
	Seek solitude			.770			
	Refresh myself			.709			
	Promote physical and mental health			.767			
	Provide a sense of pleasure	Competence Mastery type		.734			
	Reduce stress and tension			.729			
Interactive Social	Building friendship			.899			
	Seeking companionship			.894			
	Sense of belonging			.891			
	Respect from others	Interactive Social type		.884	4.516	75.273	75.273 0.878
	Generating interactions			.839			
	Expressing thoughts and feelings			.794			
Competence Mastery	Improving work ability			.923			
	Challenging oneself			.895			
	Developing skills and abilities	Competence Mastery type		.878	4.414	73.568	73.568 0.911
	Demonstrating			.810			

Growth Intelligence	one's talents					
	Understanding oneself better	Growth Intelligence type	.854			
	Enhancing creativity		.778			
	Discovering new things		.878			
	Exploring new ideas		.877			
	Satisfying curiosity	Growth Intelligence type	.782	2.679	66.964	66.964
	Expanding knowledge areas		.763			
	Learning about surrounding things		.726			
						0.789

The factor structure identified in this study is largely consistent with the leisure motivation scale proposed by Beard and Ragheb (1983), with only a few differences in categorization. The first factor includes all items from the "Stimulus Avoidance type" and three items from the "Competence Mastery type" that originally belonged to the "making me feel more energetic," "promoting physical and mental health," and "making me feel exhilarated" categories. The second factor, "Interactive Social type," includes all items, and the third factor includes all items from the "Competence Mastery type" and two items from the "Growth Intelligence type," "learning more about myself" and "enhancing creativity."

4.2.2 Leisure Motivation Cluster Analysis and Naming

In order to group participants based on their leisure motivations, hierarchical clustering analysis using Ward's method was employed. Hair et al. (1998) suggested that the percentage of change in the agglomeration coefficient, which produces a significant drop when changing the number of clusters, indicates the appropriate number of clusters. As the percentage significantly changed when agglomerating from four to three clusters (Table 14), the optimal number of clusters was determined to be three. Secondly, non-hierarchical clustering analysis using the K-means method was used to identify the

structure of each cluster. The clustering results showed that Cluster A included 61 individuals, Cluster B included 23 individuals, and Cluster C included 43 individuals.

In order to confirm whether the average vectors of the four factors among clusters are significantly different, a multivariate analysis of variance (MANOVA) was conducted, and the statistical value of the analysis reached a significant level of 0.05 (Sig. = 0.000), indicating that the leisure motivation factors of individuals in each cluster are significantly different. At the same time, according to the Scheffe multiple comparisons and the mean size in Table 14, each cluster can be appropriately named as follows: 1) Cluster A - Interactive Exploration Type: the leisure motivation of Cluster A has higher average scores in factors 2 and 4 than the other clusters, so it is named "Interactive Exploration Type"; 2) Cluster B - Learning Challenge Type: Cluster B has the highest score in factor 1, which is mainly composed of the original construct of "Growth Intelligence", and the secondary high score is in factor 3, with the highest average score among the three clusters, mainly composed of the original construct of "Competence Mastery", so it is named "Learning Challenge Type"; 3) Cluster C - Stimulus Avoidance Type: the personality trait of Cluster C has the highest average score in "Stimulus Avoidance", so this cluster is named "Stimulus Avoidance Type".

Table 14. Schéffe multiple comparisons for leisure motivation

Factor	A	B	C	<i>p</i>	Schéffe	M
Stimulus Avoidance	-0.28	-1.01	1.53	0.000	C>A,B	C>A>B
Interactive Social	1.82	-2.00	-2.24	0.000	A>B,C	A>B>C
Competence Mastery	-2.65	1.75	-1.08	0.021	B,C>A	B>C>A
Growth Intelligence	1.75	1.87	-2.36	0.012	B,A>C	B>A>C

To investigate whether users from different leisure motivation clusters have different needs and preferences for the quality attributes of Live Streaming of Performance, as well as whether there are differences in the correlation between the performance of quality attributes and overall satisfaction, this study further applied the Kano regression model for in-depth analysis. The average ratings of quality attributes for Live Streaming of Performance by the three user clusters were used as the independent variables, and satisfaction was used as the dependent variable in the regression analysis using Equation (1), as shown in Table 15.

The Kano quality classification results for the three player groups showed that, except for "Performer live streamer has a unique personality" being classified as a must-be quality, and "Impressive content" being classified as a one-dimensional quality, the results for other quality attributes were not the same. For example, the quality attribute "Can respond to fans' attention at any time" was classified as a must-be quality for Group A players, as indifferent quality for Group B, and as a one-dimensional quality for Group C. The study further compared the regression coefficients (β_i) of each quality attribute based on the results of Kano regression analysis.

Table 15. Kano model analysis results for leisure motivation clusters

Dimension	Attribute	A	B	C	All
Content	Q10	A	M	O	O
	Q11	O	I	I	O
	Q14	A	A	M	A
	Q8	A	A	M	A
	Q6	A	I	M	O
	Q9	I	M	O	O
	Q7	A	A	M	A
Entertainment	Q4	O	I	O	O
	Q12	M	I	O	M
	Q13	A	I	M	M
	Q15	A	A	O	O
	Q2	A	I	O	O
Uniqueness	Q1	M	M	M	M
	Q5	A	A	M	A
	Q3	O	O	O	O

To determine the differences in demand between different groups, the study introduced the concept of Kano-weight. The study hypothesized that both "satisfaction improvement" and "dissatisfaction avoidance" have equal importance in improving user satisfaction. By comparing the absolute values of the "negative quality regression coefficient" (β_1) and the

"positive quality regression coefficient" (β_2), the importance of each quality attribute is determined, indicating the impact of each quality attribute on user satisfaction. The study statistically analyzed the importance ranking of each group in different quality attributes, as shown in Table 16.

Table 16. Comparison of Kano-weight among leisure motivation clusters

Dimension	Attribute	A	Beta	B	Beta	C	Beta	All	Beta
Content	Q10	A	0.445	M	0.483	O	0.420	O	0.483
	Q11	O	0.436	I	0.419	I	0.278	O	0.416

	Q14	A	0.383	A	0.411	M	0.437	A	0.435
	Q8	A	0.432	A	0.413	M	0.598	A	0.386
	Q6	A	0.430	I	0.335	M	0.462	O	0.443
	Q9	I	0.363	M	0.465	O	0.302	O	0.448
	Q7	A	0.455	A	0.492	M	0.425	A	0.373
	Q4	O	0.446	I	0.363	O	0.356	O	0.359
	Q12	M	0.679	I	0.419	O	0.474	O	0.376
Entertainment	Q13	A	0.453	I	0.319	M	0.613	M	0.498
	Q15	A	0.571	A	0.436	O	0.421	O	0.409
	Q2	A	0.448	I	0.265	O	0.378	O	0.392
	Q1	M	0.489	M	0.499	M	0.566	M	0.499
Uniqueness	Q5	A	0.370	A	0.420	M	0.411	A	0.379
	Q3	O	0.520	O	0.385	O	0.749	O	0.431

As shown in Table 17, the authors listed the top 5 quality attributes in terms of importance for each cluster. For Cluster A, the important quality attributes are Q12, Q15, Q3, Q1, Q7, among which two are Must-be quality, two are Attractive quality, and one is One-dimensional quality. Therefore, it is necessary to ensure the Must-be quality requirements and pay attention to the Attractive quality needs for Cluster A, and consider whether the provision of One-dimensional quality is sufficient. For Cluster B, the important quality attributes are Q1, Q7, Q10, Q9, Q15, of which three are Must-be quality and two are Attractive quality. Therefore, it is necessary to ensure the Must-be quality requirements and improve the corresponding Attractive quality requirements for Cluster B. For Cluster C, the important quality attributes are Q3, Q13, Q8, Q1, Q12, of which three are Must-be quality and two are Attractive quality. Therefore, it is necessary to pay attention to the Attractive quality requirements for Cluster C, effectively improve the satisfaction of One-dimensional quality, and improve the corresponding design level.

The study reorganized the previous findings and sorted the quality attributes of each cluster according

to their importance from high to low, and compared the differences in quality attribute requirements among the clusters. The results are shown in Table 17. Cluster A (Interactive Exploratory type) values the quality attributes of the performer live streamer responding to attention and providing interactive functions as necessary, as well as emphasizing the performer live streamer's personal characteristics, which are indeed similar to the cluster's emphasis on interaction and exploration. Cluster B (Learning Challenge type) values the performer live streamer's professional expertise, and also values the ability to perform improvisation and provide a point-to-play function, which is in line with the cluster's tendency towards learning and self-challenge. Cluster C (Stimulus Avoidance type) values the quality attributes of the performer live streamer's impressive program, entertainment functions, humor, personal characteristics, and responding to fans at any time, which is in line with their leisure motivation of avoiding stimulation. Due to the differences in quality attribute requirements among the clusters, it can be concluded that there are also differences in satisfaction evaluations of the performer live streamer among the different clusters.

Table 17. Comparison of leisure motivation importance

A		B		C	
Attribute	Quality	Attribute	Quality	Attribute	Quality
Q12	M	Q1	M	Q3	O
Q15	A	Q7	A	Q13	M
Q3	O	Q10	M	Q8	M
Q1	M	Q9	M	Q1	M
Q7	A	Q15	A	Q12	O
Q13	A	Q11	I	Q6	M
Q2	A	Q12	I	Q14	M
Q4	O	Q5	A	Q7	M
Q10	A	Q8	A	Q15	O
Q11	O	Q14	A	Q10	O

Q8	A	Q3	O	Q5	M
Q6	A	Q4	I	Q2	O
Q14	A	Q6	I	Q4	O
Q5	A	Q13	I	Q9	O
Q9	I	Q2	I	Q11	I

5. Conclusion

The study and analysis results indicate that the 15 types of live streaming quality can be classified into different quality categories, indicating the existence of different (two-dimensional) correlation factors between quality content and satisfaction. Factor analysis divides the 15 Live Streaming of Performance quality attributes into Content, Entertainment, and Uniqueness, with a importance ranking of Content>Uniqueness>Entertainment. Content and Uniqueness are one-dimensional quality attributes, while Entertainment is a Must-be quality attribute.

This study utilized the Leisure Motivation Scale to categorize live streaming users into three groups: interactive-explorative, learning-challenging, and stimulus avoidance types. The Kano model was applied to analyze the importance of 15 quality attributes of Live Streaming of Performance, which were categorized into content, entertainment, and uniqueness, with content being the most important. The study found that users with different leisure motivations had different requirements for quality attributes. Cluster A emphasized interaction and exploration, while Cluster B valued professionalism and self-challenge, and Cluster C prioritized stress relief and amusement.

In this study, among the 127 participants, the most preferred Performance live streaming were Liz (71 times), Kate (39 times), and Zaya (17 times). As there were differences in the number of live streaming samples, this study did not compare the preferences for different types of talents. There is a research gap in investigating the differences in preferences among live streaming users for different Live Streaming of Performance. Further research can focus on studying different types of talents separately or increasing the sample size of live streaming users to improve the reliability and validity of the results. This can provide more effective basis for the design and improvement of Performance live streaming in the future.

References

Beard, J. G., & Ragheb, M. G. (1983). Measuring leisure motivation. *Journal of Leisure Research*, 15 (3), 219-228. DOI:10.1080/00222216.1983.11969557

Chen, C. C. (2012). Applying Kano Model to Explore the Quality Requirements of Game Players

with Various Personalities-A Role-Playing Game Case Study. *Journal of Business Design*, 16, 15-33. DOI: 10.29514/TJCD.201212.0002

Chen, N. C., Huang, J. H., Chen, J. Z., (2022). Exploring the Attractive Attributes of Live Streaming of Artistic Performance. 2022 International Conference on Management Engineering. *Software Engineering and Service Sciences*, 119-126. DOI:10.1109/ICMSS55574.2022.00026

Chen, W. C. (2021). *Exploring the Factors Influencing Consumer Engagement in Livestream Platform Type under the COVID-19 Pandemic*. DOI:10.1039/D1SC01741A

Deci, E. (1975). *Intrinsic Motivation*, NY: Plenum Press. DOI:10.1007/978-1-4613-4446-93

Forbes, D. L. (2011). Toward a unified model of human motivation. *American Psychology Association*, 15(2), 85-98. DOI: 10.1037/a0023483

Govers, C. M. P. (1996). What and how of quality function deployment (QFD). *International Journal of Production Economics*, 46-47, 575 - 585. DOI: 10.1016/0925-5273(95)00113-1

Gao, J. J. (1998). A three-factor model of leisure benefits. *Outdoor Recreation Research*, 11(1), 1-21. DOI: 10.6130/JORS.1998.11(1)

Guo, Y. J. (2019). *Information Dissemination and Participation Experience of Professional Webcasting*. DOI: 10.1049/inp.20070111

Genesis Intercity Market Research Consultant (2020). Taiwan live broadcast market: What do Taiwanese netizens watch live? "investigation. Retrieved December 02, 2020, Retrieved from https://www.ixresearch.com/news/news_07_06_17.

Heo, J. K., Yong, J. K. & Yan, J. Z. (2020). Sustainability of Live Video Streamer's Strategies: Live Streaming Video Platform and Audience's Social Capital in South Korea. *Sustainability*, 12(5), 2-13. DOI:10.3390/su12051969

Hsu, C. L., Judy, L. & Miao, Y. F. (2020). Why Are People Loyal to Live Stream Channels? The Perspectives of Uses and Gratifications and Media Richness Theories. *Cyberpsychology, Behavior, And Social Networking*, 23(5), 351-356. DOI: 10.1089/cyber.2019.0547

Hsu, T. Y. (2021). *Digital Generation—Exploration of Live Broadcasting and Internet Behavior*. Retrieved from <https://ndltd.ncl.edu.tw/cgi-bin/gs32/gswweb.cgi/ccd=i dVYpg/record?r1=1&h1=5>

- Iso-Ahola, S. E. (1982). Toward a social psychological theory of tourism motivation: A rejoinder. *Annual of Tourism Research*, 9(2), 256-262. DOI: 10.1016/0160-7383(82)90049-4
- Iso-Ahola, S. E. (1997). A Psychological Analysis of Leisure and Health. *Work, Leisure and Well-being*, 131-144. DOI: 10.4324/9780203135174-16
- Jane, A. C., Dominguez, S. M. (2003). Citizens' role in health services: Satisfaction behavior: Kano's model. *Quality Management in Health Care*, 12(1), 64-71. DOI: 10.1097/00019514-200301000-00010
- Kano, N., Seraku, N., Takanashi, F. and Tsjui, S. (1984). Attractive Quality and Must-be Quality. *The Journal of Japanese Society for Quality Control*, 14(2), 39-48. DOI: 10.1002/chin.198443190
- Losier, G. F., & Bourque, P. E. (1993). A motivational model of leisure participation in the elderly. *Journal of Psychology*, 127(2), 153-171. DOI: 10.1080/00223980.1993.9915551
- Loudon, D. L. & Bitta, A. J. (1993). *Consumer behavior: Concepts and applications (4th)*. NY: McGraw-Hill. DOI: 10.2307/3151130
- Lounsbury, J. W., & Polik, J. R. (1992). Leisure needs and vacation satisfaction. *Leisure Sciences* 14 (2), 105-119. DOI:10.1080/01490409209513161
- Matzler, K., Hinterhuber, H. H. (1998). How to make product development projects more successful by integrating Kano's model of customer satisfaction into quality function deployment. *Technovation*, 18(1), 25-38. DOI:10.1016/S0166-4972 (97)00072-2
- Mowen, J. C. & Spears, N. (1999). A Hierarchical model approach to understanding compulsive buying among college students. *Journal of Consumer Psychology*, 8(4), 407-430. DOI: 10.1111/j.1470-6431.2010.00923.x
- Nobuyuki, I. (2003). *Discontinuous Era (translated by Liu Jinxiu)*. Taiwan: Taipei: Shang Zhou Publishing. (originally published in 2002) ISBN: 9789861240893
- National Arts and Cultural Activities Information System Network (2020). Retrieved December 02, 2020. Retrieved December 02, 2020, retrieved from <https://event.moc.gov.tw/mp.asp?mp=1>
- Ryan, C., & Glendon, I. (1998). Application of leisure motivation scale to tourism. *Annals of Tourism Research*, 25(1), 169-184. DOI: 10.1016/S0160-7383(97)00066-2
- Shen, X. X., Tan, K. C., & Xie, M. (2000). An integrated approach to innovative product development using Kano's model and QFD. *European journal of innovation Management*, 3(2), 91-99. DOI: 10.1108/14601060010298435
- Starzyk, K. B., Reddon J. R., & Friel, J. P. (2000). Need structure, leisure motivation, and psychological adjustment young offenders and high school student. *Journal of Offender Rehabilitation*, 31(1-2), 163-174. DOI: 10.1300/J076v31n01_11
- Sireli, Y., Kauffmann P., & Ozan E. (2007). Integration of Kano's model into QFD for multiple product design. *IEEE Transactions on Engineering Management*, 54(2), 380-390. DOI: 10.1109/TEM.2007.893990
- Sruoginis(2018). *Live Video Streaming—A Global Perspective*. Retrieved May 02, 2021. rom the World Wide Web: <http://www.iab.com/insights/live-video-streaming-2018>
- Shen, Q., Chen, J., Wu, S., He, J. (2021). Using the Kano quality model to explore the quality needs of players with different personality traits for multiplayer online battle arena mobile games. *Journal of Kansei*, 9(1), 29-51. Retrieved from <http://jokansei.twtik.org/index.php/jokansei/article/view/55>
- Tang, Y. H. (2021). Live webcast under the COVID-19 epidemic Application development discussion. Retrieved from <https://ndltd.ncl.edu.tw/cgi-bin/g32/gswb.cgi/ccd=i dVYpg/record?r1=1&h1=1>
- Ting, S., Chen, C. (2002). The asymmetrical and non-linear effects of store quality attributes on customer satisfaction. *Total Quality Management* 13(4), 547-569. DOI: 10.1080/09544120220149331
- Twinc (2020). 2020 Taiwan Internet Report. Retrieved May 02, 2021. From <https://report.twinc.tw/2020/>
- Vasilash, G. S. (1995). Attractive quality: Getting it can help. *Production*, 107(1), 64-65. DOI: 10.1049/tpe.1985.0142
- Wang, S. H. (2022). The Influences of Live Streaming Concert Service Content, Publicity and Promotion Toward Ticket Purchase Intention. Retrieved from <https://ndltd.ncl.edu.tw/cgi-bin/g32/gswb.cgi/ccd=i dVYpg/record?r1=1&h1=6>
- Yang, C. C. (2005). The Refined Kano's Model and Its Applications. *Total Quality Management*, 16(10): 1127- 1137. DOI: 10.1080/14783360500235850
- Yang, W. L. (2020). An Evaluation of Short Video and Live Streaming on Social Media and Live Streaming Platforms: Behavior and Context. Retrieved from <https://ndltd.ncl.edu.tw/cgi-bin/g32/gswb.cgi/ccd=i dVYpg/record?r1=1&h1=8>
- Yao, K. Q. (2021). *Research on the Marketing Strategy of Live Stream Concert in the Post-pandemic Era*. (Master's thesis). Retrieved from <https://hdl.handle.net/11296/f464wt>

Appendix A

Survey Questionnaire on Quality Evaluation of Talent Live Streaming using Kano Model

Dear respondent,

This study aims to understand user appeal and preferences towards talent-oriented live streams (singing, singing with instruments, playing musical instruments, variety shows), as well as the satisfaction and importance performance of streamer quality. An evaluation of the test sample will be carried out. Thank you for taking time out of your busy schedule to complete this questionnaire.

This questionnaire is anonymous, and all data will only be used for academic research and will not be disclosed individually. Please feel free to fill in the answers. There are no standard answers for all questions, please respond according to your personal feelings and opinions. Thank you once again for your assistance and support!

I. Basic Information

Gender: ☐ Male (1) ☐ Female (2)

Age: ☐ Under 25 (1) ☐ 26-35 (2) ☐ 36-45 (3)

☐ 46 and above(4)

Daily live stream viewing: ☐ Less than 1 hour (1)

☐ 1-3 hours (2) ☐ 3-5 hours (3)

☐ Over 5 hours(4)

Most often viewed type: ☐ Singing(1)

☐ Singing with instrument(2)

☐ Playing instrument (3) ☐

Variety show (4) ☐ Other(5)

II. Quality Performance Evaluation of Talent Live Streaming

Please answer the following questions based on the live stream you watch the most.

After enjoying the first five live stream clips from the test sample via the link, press the back button on your phone to continue answering the questions.

Evaluation of Talent Live Streaming Quality

Strongly Agree 5, Agree 4, Neutral 3, Disagree 2, Strongly Disagree 1

Evaluation of Talent Live Streaming Quality	5	4	3	2	1
1. How do you feel when the talent live stream has "on-demand functionality"?					
2. How do you feel when the talent live stream displays "professional level"?					
3. How do you feel when the talent live stream includes "impromptu performances"?					
4. How do you feel when the talent live stream provides "latest popular information"?					
5. How do you feel when the talent live stream presenter is "physically appealing"?					
6. How do you feel when the talent live stream has "aesthetic visual design"?					
7. How do you feel when the talent live stream "responds to fans promptly"?					
8. How do you feel when the talent live stream is "daily companion"?					
9. How do you feel when the talent live stream presents "a variety of talent performances"?					
10. How do you feel when the talent live stream is "pleasing and uplifting"?					
11. How do you feel when the talent live stream has "entertainment functionality"?					

12. How do you feel when the talent live stream has "a sense of presence"?

13. How do you feel when the talent live stream is "humorous and interesting"?

14. How do you feel when the talent live stream displays "personal characteristics"?

15. How do you feel when the talent live stream gives "a sense of authenticity"?

16. I enjoy talent live streaming.

Appendix B

Leisure Motivation Survey Questionnaire

Dear respondent,

This is a questionnaire about "Leisure Motivation." The respondents must have experience in watching talent live streams, be 18 years old (inclusive) or above, and gender does not matter. It takes about 10 minutes to complete. Thank you for sparing the time to fill it out.

This questionnaire is answered anonymously. You can freely decide whether to fill out this research questionnaire, and you can also abandon it midway or choose not to submit after filling it out. However, the questionnaire is anonymous and uncoded. Once collected, individual respondents cannot be identified, and data cannot be withdrawn. The data obtained from this research will be processed anonymously and will only be used for this academic research. We will strictly adhere to and maintain your privacy. Thank you again for your assistance and support!

I. Basic Information

Gender: ☐ Male (1) ☐ Female (2)

Age: ☐ Under 25 (1) ☐ 26-35 (2) ☐ 36-45 (3)
☐ 46 and above (4)

Daily live stream viewing: ☐ Less than 1 hour (1)
☐ 1-3 hours (2) ☐ 3-5 hours (3)
☐ Over 5 hours (4)

Most often viewed type: ☐ Singing (1)
☐ Singing with instrument (2)
☐ Playing instrument (3)
☐ Variety show (4) ☐ Other (5)

II. Leisure Motivation Survey

(The evaluation uses a 5-point Likert scale, each question has 5 options, 1-5 points, check the degree of agreement/recognition of personal leisure motivation items, the higher the score, the more agreement/recognition.)

Leisure Motivation Items

Strongly Agree 5, Agree 4, Neutral 3, Disagree 2, Strongly Disagree 1.

Leisure Motivation	5	4	3	2	1
1. Out of curiosity about the things around me					
2. To satisfy my curiosity					
3. To explore novel concepts					
4. To understand myself better					
5. To expand my knowledge					
6. To discover new things					
7. To enhance my creativity					

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8. To interact with people
 9. To seek companionship
 10. To build friendships with others
 11. To express my thoughts, feelings, and strengths to others
 12. To show my talents to others
 13. To feel a sense of belonging
 14. To gain respect from others
 15. To make me feel exhilarated
 16. To improve my work capabilities
 17. To make me more spirited
 18. To develop skills and abilities
 19. To keep myself physically and mentally healthy
 20. As a challenge to my abilities
 21. To enjoy solitude
 22. To allow my body to relax
 23. To escape the busy pace of life
 24. To rest
 25. To relieve stress and tension
 26. To lessen the sense of rush
 27. To slow down the pace of life
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