

The Expectation and Satisfaction of Chinese Young Visitors for Longmen Calligraphy Works' Image Symbolism

Meng Li¹, Velu Perumal^{1,3*}, Sazrinee Binti Zainal Abidin¹, Ng Chwee Fang², and Abdul Rohim Tualeka³

¹*Department of Industrial Design, Faculty of Design and Architecture, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

²*Department of Foreign Languages, Faculty of Modern Languages and Communication, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

³*Department of Occupational Health and Safety, Kampus-C, Universitas Airlangga, 60115 Surabaya, Indonesia*

ABSTRACT

Longmen calligraphy is one of the highest achievements of Weibei calligraphy and plays a significant role in helping young learners acquire Weibei calligraphy skills. Chinese calligraphy is a compulsory subject for young learners; however, their interest in learning calligraphy has declined in recent years. This study investigates the expectations and satisfaction of young Chinese visitors regarding the image symbolism of Longmen calligraphy works. A quantitative research approach was adopted, and Importance-Performance Analysis (IPA) was employed to analyse the data. The sample consisted of 407 young visitors to the Longmen Grottoes. The study examined visitors' expectations and satisfaction levels to identify their preferences for the image symbolism of five selected calligraphy works. Based on the findings, this study proposes strategies to enhance young people's interest in learning calligraphy.

Keywords: Expectation and satisfaction, chinese youngster, longmen calligraphy work, image symbolism

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E-mail addresses:

gs59234@student.upm.edu.my (Meng Li)

velu@upm.edu.my (Velu Perumal)

sazrinee@upm.edu.my (Sazrinee Binti Zainal Abidin)

chweefang@upm.edu.my (Ng Chwee Fang)

abdul-r-t@fkm.unair.ac.id (Abdul Rohim Tualeka)

* Corresponding author

INTRODUCTION

In the history of Chinese calligraphy, the Longmen Twenty Statues Inscriptions are regarded as representative masterpieces of Weibei calligraphy (Li, 2022). Weibei calligraphy not only inherited elements of clerical script from the Han Dynasty (202 BC - 220 AD) but also laid the foundation for the emergence of regular script in the Tang Dynasty (618-907 AD),

marking a crucial transitional stage from clerical to regular script (S. Xu, 2023). As shown in Figure 1, this transformation reflects an important phase in the evolution of Chinese calligraphy. The preservation of calligraphy is essential for the inheritance and development of Chinese culture and also contributes to the diversity of global cultural creativity. Interpreting and understanding the Longmen calligraphy works can provide a comprehensive understanding. Longmen calligraphy works can provide deeper insights into the historical development

process of Chinese calligraphy and enhance public appreciation of the art form (L. Xu, 2022).

However, recent studies have shown that contemporary young people have limited time to learn calligraphy, and their interest and concentration are insufficient (Jia, 2023). In addition, the limited resources for calligraphy education have led to youngsters' lack of exposure and interest in calligraphy. In addition, limited educational resources have reduced their exposure to calligraphy, further weakening their engagement.



Figure 1. One of Longmen's calligraphy works

Existing teaching content and approaches also fail to effectively stimulate learners' interest (Jia, 2023). Moreover, a survey conducted by Niu (2010) indicates that visitors to the Longmen Grottoes tend to focus primarily on the Buddha carvings, often overlooking the calligraphy works. Therefore, understanding young visitors' preferences in calligraphy is crucial for enhancing their engagement. By analysing these preferences, it is possible to identify effective entry points for stimulating interest and improving learning outcomes (Jia, 2023).

Through visitor satisfaction surveys, a more comprehensive understanding of audience perception can be achieved. Based on these findings, targeted improvement strategies can be proposed to support heritage managers in promoting the value of calligraphy and enhancing public engagement and learning.

Zhu (2018) notes that the origin of Chinese characters can be traced back to pictographic forms, with oracle bone inscriptions representing an early stage in the development of Chinese writing. This stage marks a crucial transition from image-based symbols to abstract textual symbols, enabling the recording of production, daily life, thoughts, and emotions. Chinese characters convey meaning through visual form and gradually evolved into a unique aesthetic system.

With the development of Chinese history, calligraphy has transformed into an art form that combines both practical and aesthetic functions. The evolution of

Chinese characters has progressed through stages such as oracle bone script, bronze inscriptions, stone drum script, large seal script, small seal script, clerical script, and regular script, forming a rich and diverse tradition of calligraphy.

The symbolic meaning of images is fundamental to the interpretation of artworks (Zhao, 2024). Recent studies in visual culture and heritage interpretation emphasise that visitors do not passively receive visual information but actively construct meaning through cultural frameworks (Smith, 2006; Urry, 2002). In this context, calligraphy can be understood as a visual cultural artefact, where symbolic meanings are negotiated between the artwork and the viewer. Image symbolism thus serves as a bridge between visual form and cultural interpretation, influencing how young visitors perceive and engage with calligraphy works.

From this perspective, calligraphy image symbolism can be defined as the process of generating a certain meaning. For instance, visual elements such as brushstrokes, structure, layout, etc., serve as the expression forms of symbols. While the images, as cultural intermediaries and aesthetic associations, play the role of the content of the symbols. Through the process of perception and interpretation, these elements form the symbolic meaning shaped by historical, cultural and psychological backgrounds. (Arnheim, 1974; Jung, 1968; Peirce, 1931–1958; Saussure, 1916).

Within Chinese calligraphy, symbolic meaning extends beyond visual resemblance to include expressive qualities such as

strength, order, and rhythm. These qualities evoke shared cultural perceptions and emotional responses, contributing to the aesthetic experience of calligraphy.

From technique to aesthetic expression, calligraphy represents a continuous process of expansion (Hung, 2024). Writing serves a dual function: as a practical means of communication and as an artistic form of expression. While it retains its linguistic functions—such as conveying information and expressing intentions—it is distinguished by its strong aesthetic and artistic value.

Calligraphy imagery can be further categorised into external and internal dimensions. External imagery refers to visible formal features, including character structure and writing techniques. Structural aspects involve configurations such as top-bottom, left-right, enclosed, semi-enclosed, and single-component structures, as well as relationships between stroke positions. Key structural features include the alignment of the character centre, proportional relationships among components, and overall contour shape. In addition, writing techniques play a crucial role in calligraphic expression. From an artistic perspective, these techniques not only convey meaning but also reflect broader cultural aesthetics (S. Xu & Shen, 2023). In the case of Longmen calligraphy, such techniques are manifested in strong and forceful brushstrokes, variation in stroke forms, and irregular distribution of strokes.

Internal imagery refers to more implicit aspects, including style, aesthetic qualities,

emotional expression, and underlying meanings (Zhao, 2024). As noted by Y. Xu and Shen (2022), Longmen calligraphy exhibits stylistic characteristics such as grandeur, orderliness, and expressiveness. In terms of latent meaning, these works often convey historical narratives, religious content, and contextual information about Buddha statues. The Longmen Twenty Statues Inscriptions encapsulate the diverse characteristics of Weibei calligraphy and represent a comprehensive embodiment of the Longmen calligraphic style.

In summary, based on existing research, this study identifies a total of 12 image symbolism features of Longmen calligraphy, encompassing both internal and external dimensions, as shown in Table 1.

The objective of this study is to investigate the expectations and satisfaction of Chinese young visitors to the Longmen Grottoes regarding the image symbolism of five selected Longmen calligraphy works, namely Bei Hai Wang Yuan Xiang, Shi Ping Gong, Zheng Chang You, Ci Xiang, and He Lan Han.

Furthermore, this study aims to analyse young visitors' interest preferences in calligraphy learning, examine their understanding of Longmen calligraphy works, and propose strategies to enhance their engagement with and appreciation of Longmen calligraphy.

Research Limitations

This study has several limitations that should be acknowledged. First, the sample was limited to 407 Chinese young visitors to

Table 1

The feature dimensions of the image symbolism of the Longmen calligraphy works

Image Type	Dimensionality	Feature
External Image	Structural Character	The center of the font is vertical
		Each part of the font is a different size
		The fonts have different contour shapes
	Writing Technique	The brushstroke is strong and powerful
		The brushstroke shapes in the calligraphy work are various
Internal Image	Brushwork Style	The brushstroke distribution is irregular
		Majestic style
		Orderly style
	Latent Meaning	Fun style
		Record the historical background and events
		About religion
		The introduction to the statues

the Longmen Grottoes, which may restrict the generalisability of the findings to other visitor groups or cultural contexts.

Second, the scope of the study focused on visitors' expectations and satisfaction regarding the image symbolism of Longmen calligraphy works. As such, other factors that may influence calligraphy appreciation—such as prior knowledge, educational background, or cultural experience—were not examined in detail.

Third, the analysis was confined to the Longmen Twenty Statues Inscriptions, with particular emphasis on five representative calligraphy works. Although these works were selected to reflect stylistic diversity, they may not fully represent all characteristics of Longmen calligraphy.

Finally, the study relied on questionnaire-based data collection, which

may be influenced by respondents' subjective perceptions and self-reporting bias. Future research may incorporate qualitative methods or experimental approaches to provide a more comprehensive understanding of calligraphy image symbolism and audience perception.

METHOD

This study employed a questionnaire survey to collect quantitative data. Questionnaire-based methods are widely used in social science research to capture attitudes, perceptions, and behavioural tendencies through structured instruments (Murphy, 2023). In this study, the questionnaire was designed to measure visitors' expectations and satisfaction regarding the image symbolism of Longmen calligraphy works.

Compared with other data collection methods, questionnaire surveys allow for the efficient collection of data from a relatively large sample, enabling statistical analysis and enhancing the objectivity of the findings (Frey, 1994). In addition, standardised questionnaire design ensures consistency in data collection and facilitates comparative analysis across respondents (Vaziri, 2012).

To improve the validity and reliability of the data, the questionnaire was designed with clear research objectives and a manageable number of items. Each dimension was measured using a limited set of focused questions to reduce respondent fatigue and improve response quality.

In addition, Importance-Performance Analysis (IPA) was selected because it allows for the simultaneous evaluation of visitors' expectations and satisfaction, providing a structured framework to identify priority areas for improvement. Compared with other methods, IPA is particularly suitable for cultural heritage studies as it translates subjective perceptions into actionable insights (Bacon, 2003; Matzler et al., 2003; Patton, 2002).

In the study, the five selected calligraphy works were chosen as representative examples of the Longmen Twenty Statues Inscriptions, reflecting variations in style, structure, and inscription content. However, as purposive sampling was adopted, the findings may not be fully generalisable to all visitor groups. Future studies may consider broader sampling strategies and comparative analysis across different calligraphy styles.

Study Sample

Purposive sampling was adopted in this study to select participants who met specific research criteria. This sampling approach is appropriate when the research focuses on a particular group with shared characteristics, allowing for more targeted and relevant data collection (Thomas, 2022).

The sample consisted of young Chinese visitors from different regions who visited the Longmen Grottoes, with an age range of 18 to 25 years. This group was selected as it represents the target population of interest for examining young audiences' perceptions of calligraphy.

According to Cochran's sample size formula, a minimum sample size of 385 is required at a 95% confidence level. The final sample of 407 respondents, therefore, meets the recommended threshold for statistical analysis.

As a non-probability sampling method, purposive sampling enables researchers to select participants based on predefined criteria, such as relevance to the research topic and willingness to participate (Oliver, 2015). While this approach enhances the focus and practicality of the study, it may also limit the generalisability of the findings.

Data Collection Tools

The data for this study were collected using a structured questionnaire titled "Survey of Chinese Young Visitors' Expectations and Satisfaction with the Image Symbolism of the Longmen Twenty Statues

Inscriptions,” developed by the researchers. Respondents completed the questionnaire by scanning a QR code using their mobile devices.

PROCESS AND PROCEDURE

Before data collection, the questionnaire was designed based on the 12 dimensions of image symbolism identified for the Longmen Twenty Statues Inscriptions. The questionnaire consisted of three sections: (1) demographic information, (2) expectation assessment, and (3) satisfaction evaluation of five representative calligraphy works.

The questionnaire was developed and administered using the online survey platform Wenjuanxing. Before the formal survey, a pilot test was conducted with 80 young visitors and one calligraphy practitioner to ensure clarity, reliability, and validity of the instrument. Minor revisions were made based on the pilot results.

The formal survey was conducted anonymously. Participants were informed of the purpose and content of the study before participation, and informed consent was obtained before they proceeded to complete the questionnaire. The overall research process is illustrated in Figure 2.

After the data collection was completed, the data were analysed using appropriate statistical methods. Detailed results are presented in the Results section.

Data Analysis

The data collected in this study were analysed using IBM SPSS Statistics. Importance-Performance Analysis (IPA) was employed to examine the relationship

between visitors' expectations (importance) and satisfaction (performance) regarding the image symbolism attributes of Longmen calligraphy.

IPA is a widely used analytical technique that presents data in a two-dimensional grid, where importance and performance values are plotted along the vertical and horizontal axes, respectively (Feng et al., 2014). This approach enables researchers to identify priority areas for improvement by comparing the relative importance and performance of different attributes (Matzler et al., 2003).

The IPA framework categorises attributes into four quadrants: (1) “Keep up the good work” (high importance, high performance), (2) “Concentrate here” (high importance, low performance), (3) “Low priority” (low importance, low performance), and (4) “Possible overkill” (low importance, high performance). These quadrants provide a clear basis for interpreting visitor perceptions and identifying areas that require managerial attention (Ford, 1999; Lai & To, 2010).

Given its ability to translate subjective perceptions into actionable insights, IPA is particularly suitable for analysing visitor experience in cultural heritage contexts. In this study, it was used to evaluate young visitors' perceptions of calligraphy image symbolism and to identify key attributes that influence their engagement (Figure 3).

RESULTS

The questionnaire data were analysed to provide a detailed overview of the findings.

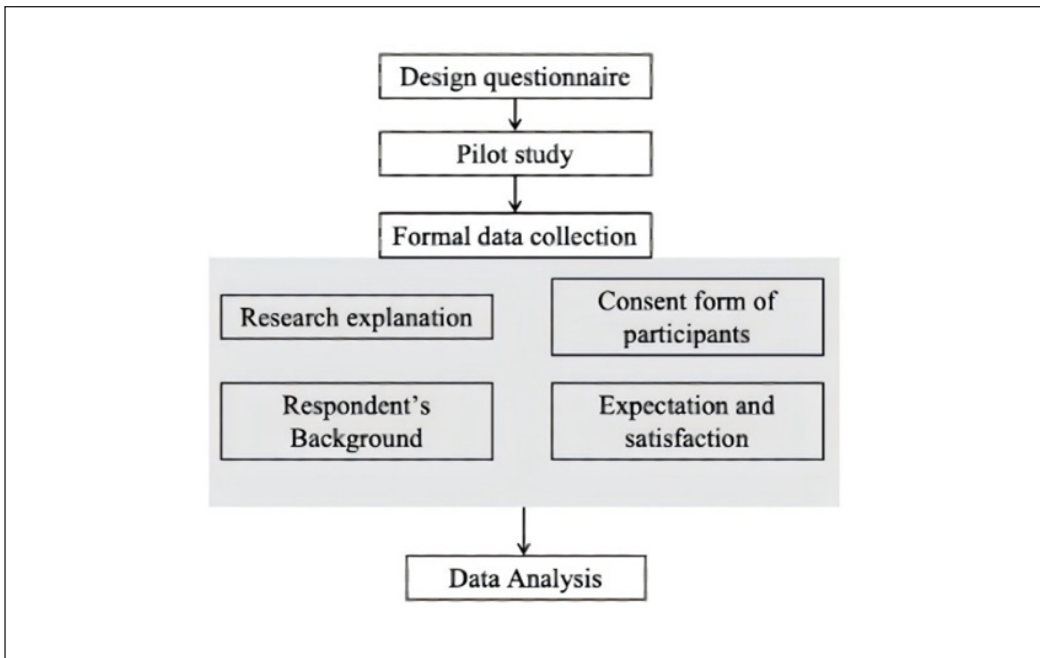


Figure 2. The process of the questionnaire survey

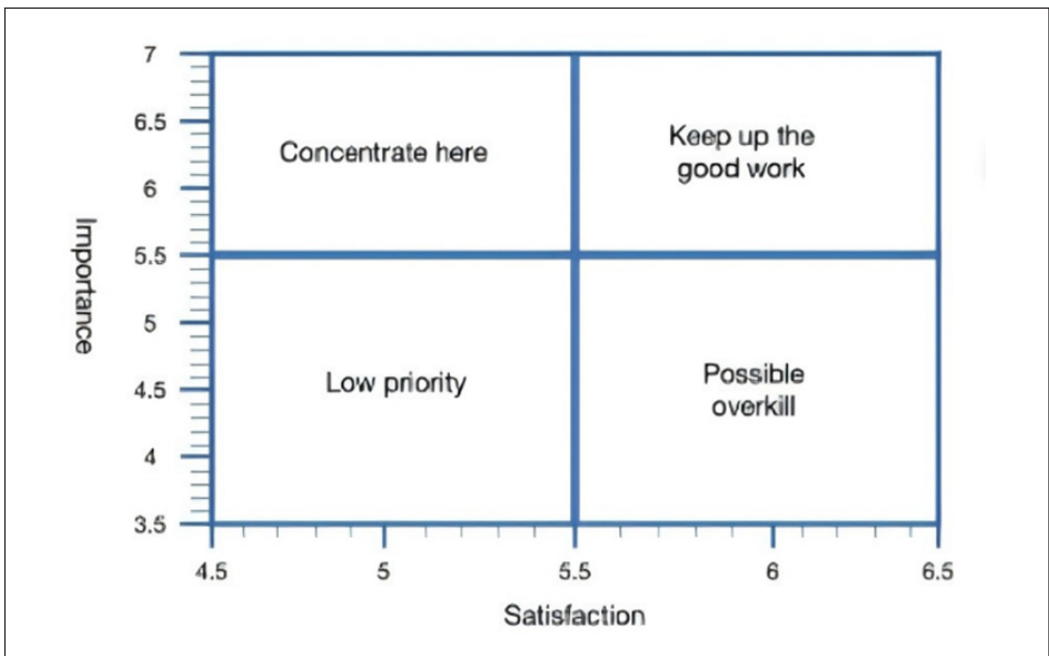


Figure 3. IPA quadrant diagram

Personal Information of Respondents

Among the respondents, males accounted for 52.33% of the sample, while females represented 47.67%. In terms of age distribution, 45.21% of respondents were aged 18-21, and 54.79% were aged 22-25.

Regarding calligraphy experience, 41.03% of respondents were amateur learners with 6–10 years of experience, while 36.61% were beginners with 0–5 years of experience. In addition, 22.36% of respondents were classified as advanced learners with more than 10 years of experience.

These demographic characteristics are summarised in Table 2.

Reliability Analysis

For the expectation section, Cronbach's alpha coefficients for the four variables were 0.845, 0.849, 0.837, and 0.853, respectively. All values exceed the

recommended threshold of 0.7, indicating good internal consistency and reliability of the measurement instrument. The detailed results are presented in Table 3.

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy for this survey was 0.850, indicating that the data were suitable for factor analysis. The detailed results are presented in Table 4.

For the satisfaction section, the data for the five calligraphy works were analysed separately. Table 5 presents the Cronbach's alpha values for the four variables in the questionnaire, while Table 6 reports the corresponding KMO values for sampling adequacy.

Cronbach's alpha values are influenced by factors such as the number of items, inter-item correlations, and dimensionality. Previous studies suggest that acceptable alpha values typically range from 0.70 to 0.95 (Tavakol & Dennick, 2011).

Table 2
Frequency analysis results of personal information of respondents in the questionnaire survey

Characteristics of the participants	Option	Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	213	52.33	52.33
	Female	194	47.67	100.00
Age	18-21 years old	184	45.21	45.21
	22-25 years old	223	54.79	100.00
Learning Level of Calligraphy	Beginner (0-5 years of learning experience)	149	36.61	36.61
	Amateur (6-10 years of learning experience)	167	41.03	77.64
	Professional (10 years of learning experience)	91	22.36	100.00
Total		407	100.0	100.0

Table 3
Cronbach's Alpha analysis results of Chinese young visitors' expectations

Dimensionality	Number of Terms	Sample Size	Cronbach's alpha
Brushwork Style	3	407	0.845
Structural Character	3	407	0.849
Writing Technique	3	407	0.837
Latent Meaning	3	407	0.853

Table 4
KMO and Bartlett's Test of Chinese young visitors' expectations

	KMO	0.850
	Approx. chi-square	2560.812
Bartlett Test	df	66
	P value	0.000

Table 5
Cronbach's Alpha Analysis results of Chinese young visitors' satisfaction

Work	Dimensionality	Number of Terms	Cronbach's Alpha
Bei Hai Wang Yuan Xiang	S Brushwork Style	3	0.87
	S Structural Character	3	0.859
	S Writing Technique	3	0.816
	S Latent Meaning	3	0.851
Shi Ping Gong	S Brushwork Style	3	0.838
	S Structural Character	3	0.86
	S Writing Technique	3	0.817
Zheng Chang You	S Latent Meaning	3	0.838
	S Brushwork Style	3	0.893
	S Structural Character	3	0.883
Ci Xiang	S Writing Technique	3	0.837
	S Latent Meaning	3	0.886
	S Brushwork Style	3	0.85
	S Structural Character	3	0.858
He Lan Han	S Writing Technique	3	0.873
	S Latent Meaning	3	0.831
	S Brushwork Style	3	0.897
	S Structural Character	3	0.847
	S Writing Technique	3	0.905
	S Latent Meaning	3	0.896

Sample Size: 407

Table 6
KMO and Bartlett's test of Chinese young visitors' satisfaction

	KMO	0.819	
Bei Hai Wang Yuan Xiang	Bartlett Test	Approx. Chi-Square	2292.011
		df	55
		P value	0.000
	KMO	0.865	
Shi Ping Gong	Bartlett Test	Approx. Chi-Square	2504.094
		df	66
		P value	0.000
	KMO	0.847	
Zheng Chang You	Bartlett Test	Approx. Chi-Square	3111.307
		df	66
		P value	0.000
	KMO	0.858	
Ci Xiang	Bartlett Test	Approx. Chi-Square	2687.560
		df	66
		P value	0.000
	KMO	0.864	
He Lan Han	Bartlett Test	Approx. Chi-Square	3219.458
		df	66
		P value	0.000

In this study, all Cronbach's alpha values exceeded 0.70, indicating strong internal consistency across all dimensions of the questionnaire.

Regarding construct validity, KMO values between 0.60 and 0.70 are generally considered acceptable for factor analysis (Nkansah, 2018). In this study, all KMO values exceeded 0.60, indicating that the data were suitable for factor analysis and that the questionnaire demonstrated satisfactory validity.

IPA Results

Importance-Performance Analysis (IPA) was employed in this study to evaluate

the relationship between young visitors' expectations (importance) and satisfaction (performance) regarding the image symbolism attributes of Longmen calligraphy.

According to the IPA framework, attributes are categorised into four quadrants based on their importance and performance values (Saggaf, 2017). Quadrant A ("Concentrate here") includes attributes with high importance but low performance, indicating priority areas for improvement. Quadrant B ("Keep up the good work") represents attributes with both high importance and high performance, which should be maintained.

Quadrant C (“Low priority”) includes attributes with low importance and low performance, suggesting limited immediate concern. Quadrant D (“Possible overkill”) refers to attributes with low importance but high performance, where resources may be over-allocated.

As illustrated in Figure 4, the horizontal axis represents the importance of attributes, reflecting young visitors’ expectations, while the vertical axis represents performance, indicating their satisfaction levels. This framework provides a systematic basis for analysing visitor perceptions and identifying key factors influencing engagement with Longmen calligraphy.

This pattern suggests that young visitors tend to prioritise visually striking and easily interpretable symbolic features. From a visual perception perspective, bold and irregular strokes create stronger visual

stimuli, which are more likely to attract attention. Meanwhile, from a cultural perspective, religious and historical elements provide narrative context, enhancing interpretability. This indicates that the effectiveness of calligraphy appreciation is closely related to the accessibility of its symbolic meaning.

Bei Hai Wang Yuan Xiang Statue Inscription

As depicted in Figure 5, the survey findings concerning the Bei Hai Wang Yuan Xiang Statue Inscription reveal several key attributes distributed across the four quadrants.

In the first quadrant, known as the ‘advantage area’, five attributes stand out, including distinct contour shapes, orderly style, strong brushstrokes, religious references, and introductions to the statues.

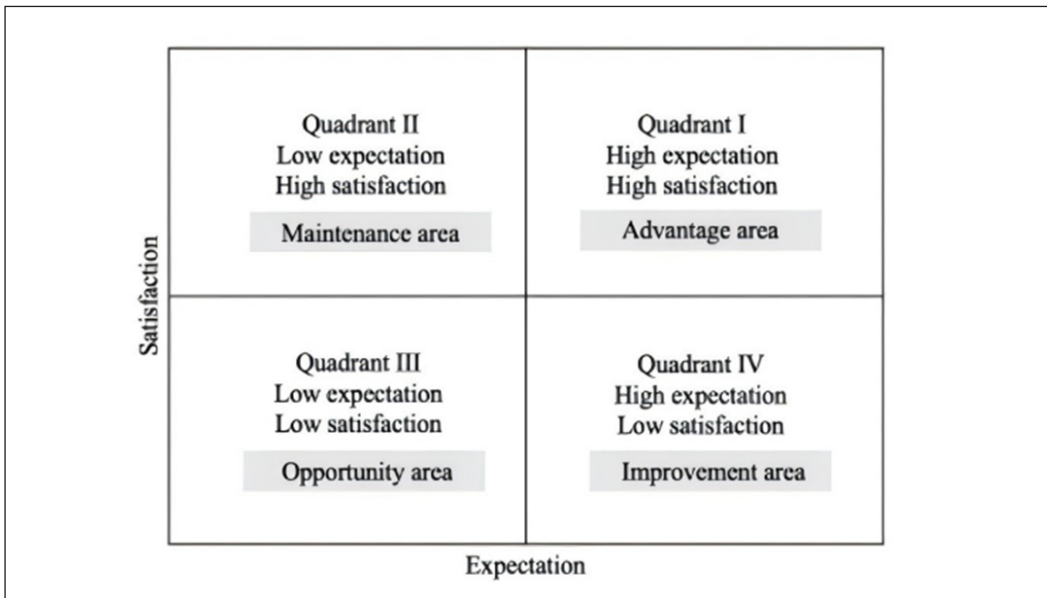


Figure 4. The importance-performance model of expectation and satisfaction

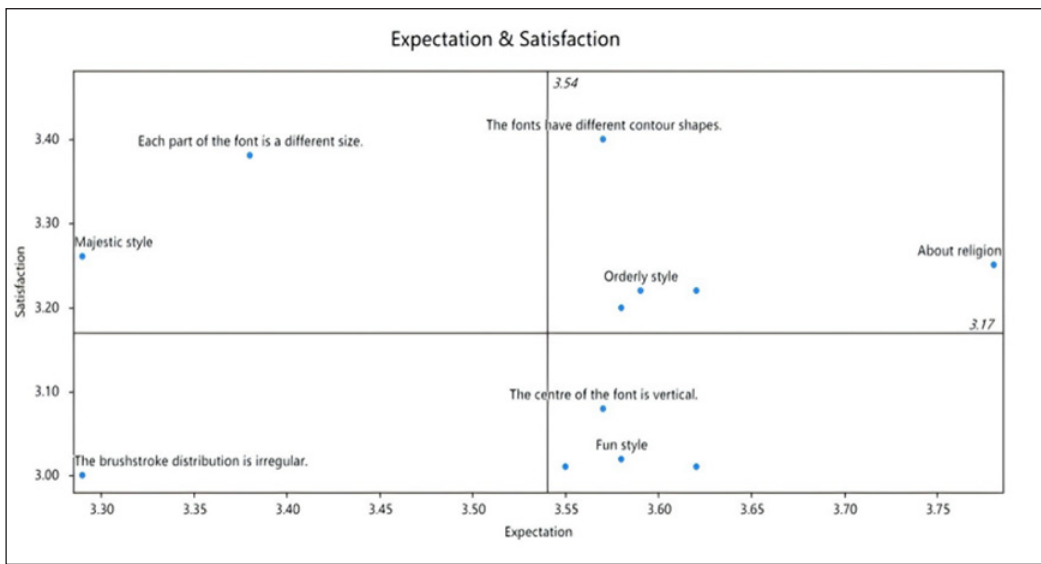


Figure 5. IPA quadrants of Bei Hai Wang Yuan Xiang statue inscription

These attributes demonstrate both high importance and high satisfaction, suggesting that they align well with visitors' aesthetic expectations. From the perspective of calligraphy image symbolism, strong brushstrokes and clear contour variations provide immediate visual impact, while religious content and narrative introductions offer culturally familiar symbolic cues. This combination of visual salience and cultural accessibility enhances interpretability, making these features more easily appreciated by young visitors.

In the second quadrant, the 'maintenance area', two attributes are identified: variation in font size and majestic style. Although these attributes are associated with relatively lower expectations, they achieve high satisfaction levels. This may indicate that such features are perceived as supplementary

aesthetic qualities rather than primary evaluative criteria. The "majestic style," in particular, reflects a broader stylistic perception that may not be consciously expected but still contributes positively to the overall impression once experienced.

In the third quadrant, labelled the 'opportunity area', irregular brushstroke distribution is identified as having both low importance and low satisfaction. This suggests that this feature is not only less noticeable to young visitors but may also be difficult to interpret without prior knowledge of calligraphic aesthetics. From a symbolic perspective, irregularity in stroke distribution often conveys dynamism and expressive freedom in professional calligraphy evaluation; however, for general audiences, such abstract qualities may lack clear symbolic reference, leading to lower engagement.

In the fourth quadrant, known as the ‘improvement area’, four attributes are identified: vertical alignment of the font centre, playful (fun) style, variation in brushstroke forms, and records of historical background and events. These attributes are considered important by visitors but yield lower satisfaction levels, indicating a gap between expectation and perception. This gap may be attributed to the limited interpretive accessibility of these features. For instance, structural characteristics such as vertical alignment require a certain level of formal training to be appreciated, while historical content may not be effectively communicated without adequate contextual interpretation. This suggests that enhancing interpretive support, such as explanatory materials or guided narratives, could improve visitors’ understanding and satisfaction with these aspects.

Overall, the results indicate that young visitors’ engagement with the Bei Hai Wang Yuan Xiang Statue Inscription is strongly influenced by the balance between visual immediacy and cultural interpretability. Features that are both visually prominent and symbolically accessible tend to achieve higher evaluations, while more abstract or knowledge-dependent elements require additional interpretive mediation.

Shi Ping Gong Statue Inscription

Figure 6 illustrates the survey results for the Shi Ping Gong Statue Inscription. The distribution of attributes across the IPA quadrants reveals a pattern largely consistent with the previous work, highlighting the

importance of visual salience and cultural interpretability in shaping visitor perception.

In the first quadrant, or the ‘advantage area’, five attributes are identified: distinct contour shapes, orderly style, strong brushstrokes, religious references, and introductions to the statues. These features demonstrate both high importance and high satisfaction, indicating that they effectively meet visitors’ expectations. From the perspective of calligraphy image symbolism, these attributes combine strong visual expressiveness with clear cultural narratives, making them more accessible to young audiences and easier to interpret.

In the second quadrant, the ‘maintenance areas’, two attributes—variation in font size and majestic styles show relatively lower importance but high satisfaction. This suggests that while these features are not primary determinants of visitor expectations, they still contribute positively to the overall aesthetic experience. The perception of “majestic style” may function as a holistic impression rather than a consciously evaluated feature.

In the third quadrant, irregular brushstroke distribution appears as an ‘opportunity area’s attribute, with both low importance and satisfaction. This indicates that such abstract stylistic features may not be readily perceived or valued by young visitors. Although irregularity can convey dynamism and individuality in professional calligraphy discourse, its symbolic meaning may not be immediately accessible to non-expert audiences.

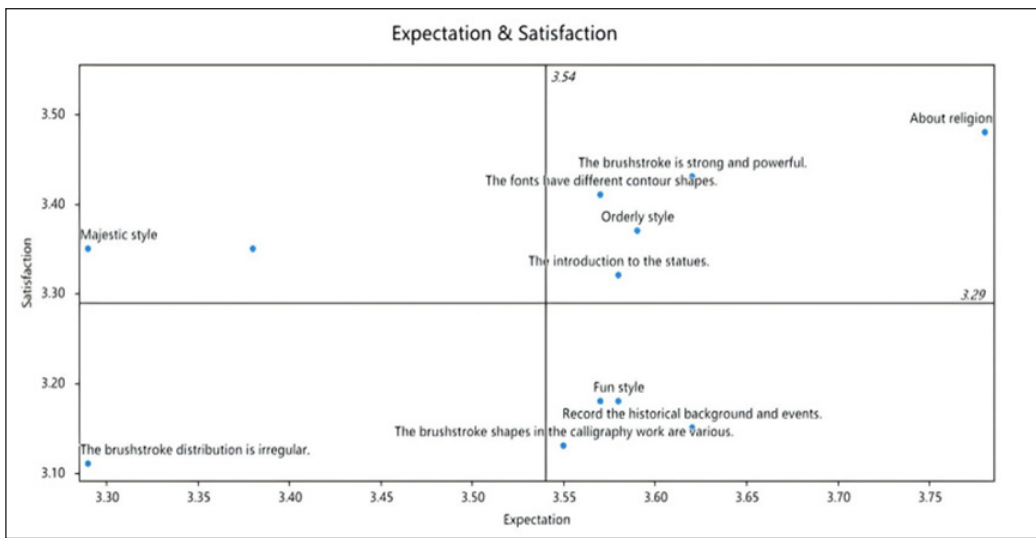


Figure 6. IPA quadrants of Shi Ping Gong statue inscription

In the fourth quadrant, the ‘improvement area’, four attributes are identified: vertical alignment of the font centre, playful style, variation in stroke forms, and historical background records. These attributes are considered important but yield lower satisfaction levels, suggesting a mismatch between expectation and experience. This gap may result from insufficient interpretive support, as structural and historical elements often require contextual knowledge to be fully understood.

Overall, the results suggest that the perception of this inscription is strongly influenced by the immediacy of visual impact and the clarity of symbolic meaning, reinforcing the importance of interpretability in calligraphy appreciation.

Zheng Chang You Statue Inscription

Figure 7 presents the survey results for the Zheng Chang You Statue Inscription.

Compared with other works, this inscription shows a broader distribution of attributes in the ‘advantage area’, indicating a higher overall alignment between visitor expectations and satisfaction.

In the first quadrant, seven attributes are identified, including vertical font alignment, orderly style, strong brushstrokes, religious content, introductions to the statues, historical records, and playful style. The presence of both structural and symbolic attributes in this quadrant suggests that this work achieves a balance between formal composition and cultural meaning. From the perspective of image symbolism, the integration of visually clear structures and culturally meaningful content enhances both perceptual clarity and interpretive accessibility.

In the second quadrant, three attributes—variation in font size, majestic style, and irregular stroke distribution—are in the ‘maintenance area’.

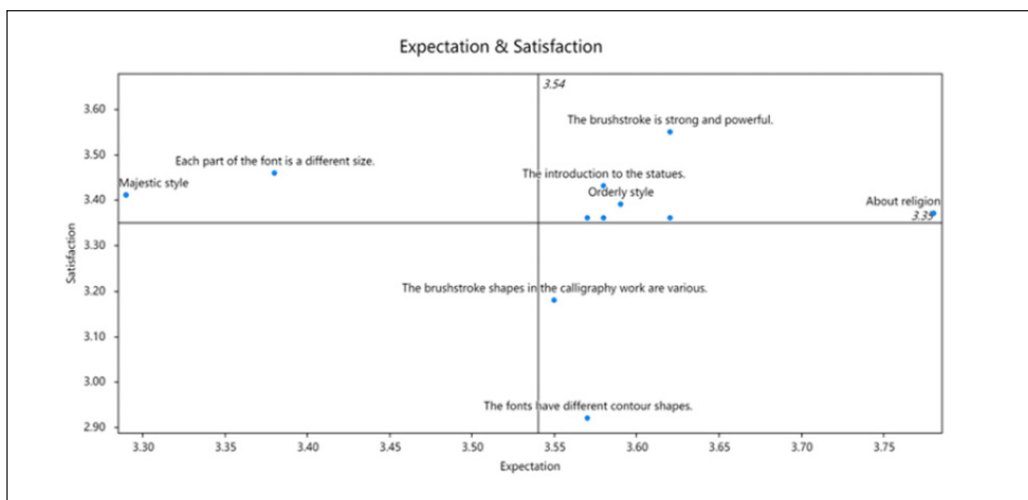


Figure 7. IPA quadrants of Zheng Chang You statue inscription

These features, while not highly prioritised, still achieve high satisfaction, indicating that they contribute to the richness of the visual experience without being central to visitor evaluation.

Notably, no attributes are found in the third quadrant, suggesting that there are no features that are both low in importance and satisfaction. This may indicate that the work is relatively well-balanced and does not contain elements that are entirely overlooked or undervalued by visitors.

In the fourth quadrant, two attributes—distinct contour shapes and variation in stroke forms—are identified as needing improvement. Despite their high importance, satisfaction levels are lower, which may be attributed to the complexity of these visual features. Such elements often require a more refined level of visual literacy to interpret, highlighting a gap between expert-level appreciation and general audience perception.

Overall, this inscription demonstrates a relatively high level of coherence between visual form and symbolic meaning, though certain complex formal features still require enhanced interpretive support to improve visitor engagement.

Ci Xiang Statue Inscription

Figure 8 depicts the survey findings for the Ci Xiang Statue Inscription. The results reveal a distribution pattern that emphasises the importance of both visual distinctiveness and symbolic clarity in shaping visitor responses.

In the first quadrant, six attributes are identified: distinct contour shapes, orderly and playful styles, religious content, vertical stroke forms, and historical records. These attributes achieve both high importance and satisfaction, suggesting that they effectively integrate visual expressiveness with meaningful content. The coexistence

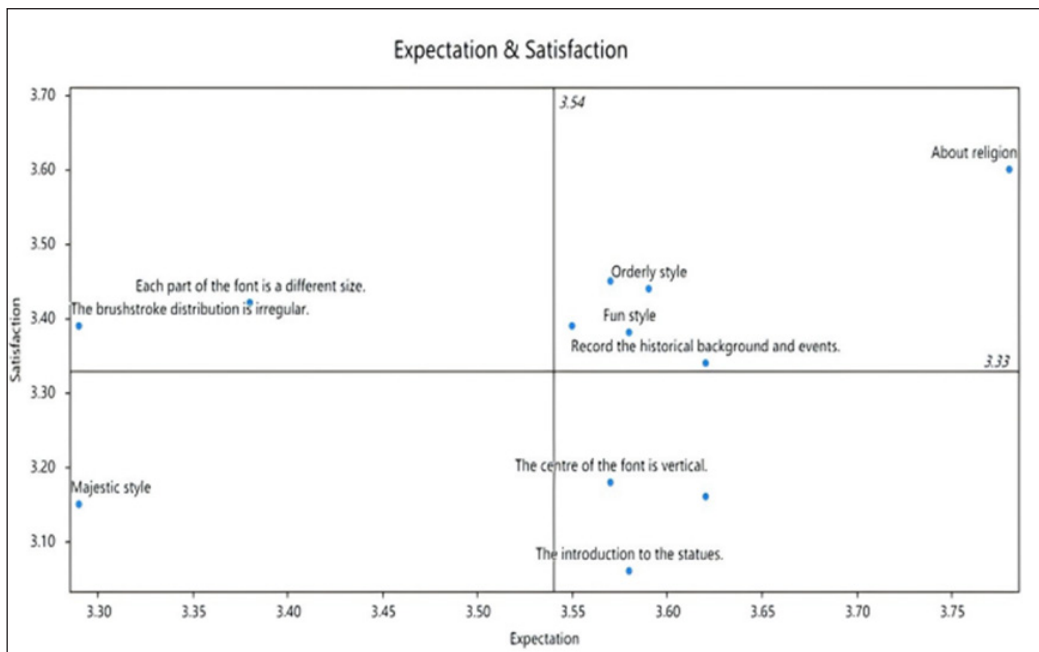


Figure 8. IPA quadrants of Ci Xiang statue inscription

of “orderly” and “fun” styles also indicates a diversity of aesthetic appreciation among young visitors.

In the second quadrant, variation in font size and irregular brushstroke distribution are categorised as ‘maintenance area’ attributes. Their high satisfaction despite lower importance suggests that these features enhance the visual richness of the work, even if they are not consciously prioritised by viewers.

In the third quadrant, majestic style is identified as having low importance and satisfaction. This may indicate that this stylistic quality is less perceptible or less relevant to younger audiences, possibly due to its abstract and holistic nature.

In the fourth quadrant, three attributes—vertical font alignment, strong brushstrokes, and introductions to the statues—are identified as areas for improvement. Although these attributes are considered important, their lower satisfaction suggests that their symbolic meaning may not be effectively communicated. For example, while strong brushstrokes are visually prominent, their deeper aesthetic or expressive significance may not be fully understood without guidance.

Overall, the findings suggest that visitor engagement with this inscription is influenced by both diversity in visual expression and the clarity of symbolic communication, highlighting the need for interpretive strategies that bridge perception and understanding.

He Lan Han Statue Inscription

Figure 9 illustrates the survey results for the He Lan Han Statue Inscription. The distribution of attributes reflects a strong emphasis on expressive and narrative elements in shaping visitor perception.

In the first quadrant, six attributes are identified: vertical stroke forms, playful style, strong brushstrokes, religious content, historical records, and introductions to statues. These attributes demonstrate both high importance and satisfaction, indicating that they effectively combine visual dynamism with accessible symbolic meaning. The presence of both expressive (e.g., strong strokes) and narrative (e.g., historical content) features suggests a well-rounded engagement with visitors.

In the second quadrant, variation in font size, majestic style, and irregular brushstroke distribution are identified as ‘maintenance area’ attributes. These features, while not highly emphasised by visitors, still contribute positively to the overall aesthetic experience.

There are no attributes in the third quadrant, indicating that no features are simultaneously low in importance and satisfaction. This suggests a relatively balanced perception of the work.

In the fourth quadrant, two attributes—vertical font alignment and orderly style—are identified as needing improvement. Despite their perceived importance, lower satisfaction levels suggest that these structural features may not be effectively

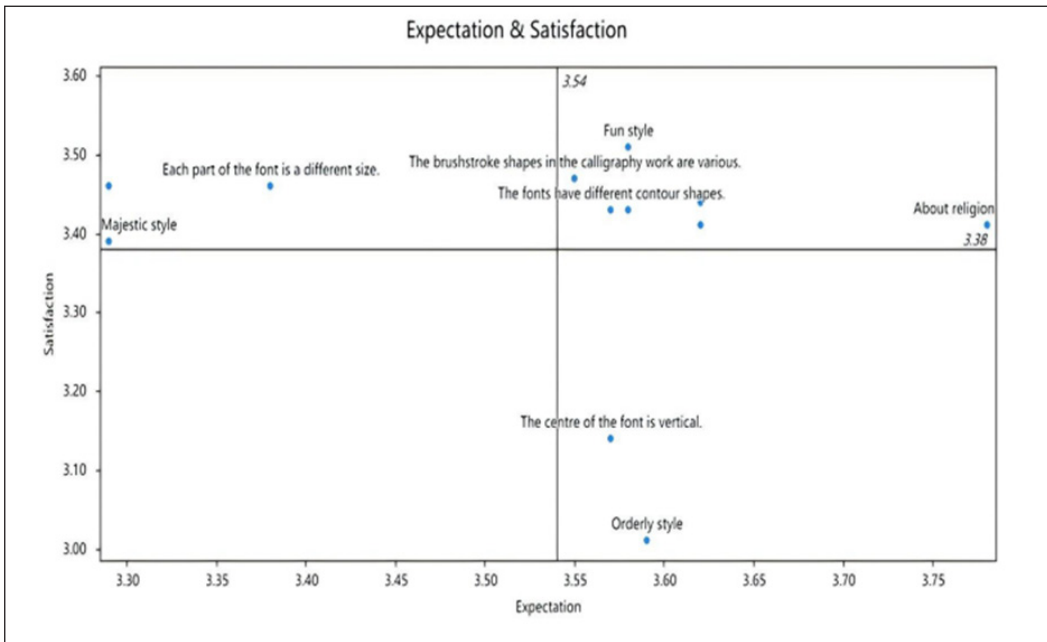


Figure 9. IPA quadrants of He Lan Han statue inscription

perceived or appreciated. This again points to the role of visual literacy, as such formal characteristics often require training to be recognised and valued.

Overall, the results indicate that this inscription successfully engages young visitors through visually expressive and culturally meaningful features, while more subtle structural aspects remain less accessible without interpretive support.

The findings of this study can be further interpreted through symbolic and perceptual theories. According to semiotic theory (Saussure, 1916), visual elements in calligraphy function as carriers of meaning, while their interpretation depends on cultural context. The preference for features such as “strong brushstrokes” and “religious content” suggests that young visitors rely on recognisable symbolic cues. This aligns with Jung’s (1968) concept of collective imagery, where shared cultural symbols shape perception. In contrast, features such as structural balance or stroke distribution require higher levels of aesthetic literacy, which may explain their lower satisfaction scores.

DISCUSSION

This study applied Importance-Performance Analysis (IPA) to examine Chinese young visitors’ expectations and satisfaction regarding the image symbolism of Longmen calligraphy. Drawing on Expectation Disconfirmation Theory (EDT), the findings demonstrate that visitor satisfaction is shaped by the relationship between perceived performance and prior expectations.

The results indicate that certain image symbolism features meet or exceed young visitors’ expectations. Attributes such as variation in font size and irregular brushstroke distribution consistently received higher-than-expected evaluations across multiple calligraphy works, suggesting a strong preference for visually dynamic and expressive forms. In addition, the “majestic style” was positively evaluated in several cases, reflecting young visitors’ appreciation for stylistic qualities associated with cultural authority and aesthetic impact, as shown in Table 7.

These findings suggest that young audiences are more responsive to symbolic features that are visually distinctive and easily interpretable, rather than purely structural or technical elements. From the perspective of calligraphy image symbolism, this highlights the importance of enhancing the visibility and interpretability of symbolic meanings in calligraphy presentation and education.

Overall, this study contributes to the understanding of how image symbolism influences visitor perception in the context of cultural heritage. It also provides a theoretical and practical basis for improving

In addition, several attributes were identified as performing below visitors’ expectations (Table 8). Although these dimensions were rated as highly important (Expectation ≥ 3.5), their corresponding satisfaction scores were significantly lower, indicating a clear negative disconfirmation.

This finding suggests that certain image symbolism features are not effectively

Table 7

The image symbolism features high satisfaction in Longmen's calligraphy works

Artwork	Dimension	Expectation	Satisfaction	Disconfirmation
He Lan Han	The brushstroke distribution is irregular	3.285	3.459	0.174
Zheng Chang You	The brushstroke distribution is irregular	3.285	3.405	0.12
Zheng Chang You	Majestic style	3.287	3.408	0.12
Ci Xiang	The brushstroke distribution is irregular	3.285	3.393	0.108
He Lan Han	Majestic style	3.287	3.393	0.106
Zheng Chang You	Each part of the font is a different size	3.378	3.459	0.081
He Lan Han	Each part of the font is a different size	3.378	3.457	0.079
Shi Ping Gong	Majestic style	3.287	3.349	0.061
Ci Xiang	Each part of the font is a different size	3.378	3.418	0.039
Bei Hai Wang Yuan Xiang	Each part of the font is a different size	3.378	3.378	0

Table 8

The image symbolism features low satisfaction in Longmen's calligraphy works

Artwork	Dimension	Expectation	Satisfaction	Disconfirmation
Zheng Chang You	The fonts have different contour shapes	3.57	2.92	-0.65
Bei Hai Wang Yuan Xiang	Record the historical background and events	3.62	3.01	-0.61
He Lan Han	Orderly style	3.59	3.01	-0.58
Bei Hai Wang Yuan Xiang	Fun style	3.58	3.02	-0.56
Bei Hai Wang Yuan Xiang	The brushstroke shapes in the calligraphy work are various	3.55	3.01	-0.54
Bei Hai Wang Yuan Xiang	About religion	3.78	3.25	-0.53
Ci Xiang	The introduction to the statues	3.58	3.06	-0.52
Bei Hai Wang Yuan Xiang	The center of the font is vertical	3.57	3.08	-0.49
Shi Ping Gong	Record the historical background and events	3.62	3.15	-0.47
Ci Xiang	The brushstroke is strong and powerful	3.62	3.16	-0.46

understood or appreciated by young visitors. It highlights the need to further examine the extent to which these symbolic elements are cognitively accessible and culturally interpretable to this audience. Future research should explore the underlying factors contributing to this gap, such as insufficient interpretive guidance, abstract visual representation, or limited prior knowledge.

Across the five calligraphy works, several consistent patterns can be observed. First, attributes related to brushwork strength and religious content frequently appear in the high-importance and high-satisfaction quadrant, suggesting that these features are central to young visitors' perception of calligraphy. These elements are visually salient and culturally accessible, making them easier to interpret.

Second, structural characteristics such as font alignment, proportional variation, and stroke distribution tend to receive lower satisfaction scores despite relatively high expectations. This may indicate that such features are less immediately perceptible and require prior knowledge or training in calligraphy aesthetics.

Third, stylistic attributes such as "majestic" and "orderly" show mixed results, reflecting differences in individual aesthetic preferences and interpretive ability. From the perspective of calligraphy image symbolism, this suggests that symbolic meaning is not uniformly perceived but mediated by cultural familiarity and visual literacy.

Overall, the findings indicate that young visitors' engagement with calligraphy is strongly influenced by the accessibility of symbolic elements, highlighting the importance of interpretive support in heritage presentation and calligraphy education.

CONCLUSION

This study set out to explore the expectations and satisfaction of young Chinese visitors regarding the image symbolism of Longmen calligraphy works using Importance-Performance Analysis (IPA). The findings reveal several consistent patterns that provide deeper insights into how young audiences perceive and engage with calligraphy as a form of visual culture.

First, the results indicate that young visitors tend to prioritise visually salient and symbolically accessible features. Attributes such as strong brushstrokes, distinct contour shapes, and religious or narrative content consistently appear in the high-importance and high-satisfaction quadrant across multiple works. From a visual perception perspective, these features generate stronger visual stimuli and are more likely to attract attention. From a symbolic perspective, they are associated with culturally familiar meanings, making them easier to interpret. This suggests that the effectiveness of calligraphy appreciation is closely related to the immediacy and clarity of its symbolic expression.

Second, structural characteristics—such as font alignment, proportional variation, and stroke distribution—tend to

receive lower satisfaction despite relatively high expectations. This pattern reflects a gap between perceived importance and experience. One possible explanation is that such features require a higher level of calligraphic literacy to be fully understood. While these elements are essential in professional evaluation, their symbolic meanings are often implicit and less accessible to general audiences. This finding highlights a key challenge in calligraphy appreciation: the disconnect between expert-oriented formal aesthetics and public perception.

Third, stylistic attributes such as “majestic” and “orderly” exhibit more varied distributions across the IPA quadrants, suggesting differences in individual aesthetic preferences and interpretive abilities. These qualities are often holistic and abstract, making them more difficult to define and recognise without prior experience. This variability indicates that symbolic meaning in calligraphy is not uniformly perceived but is mediated by viewers’ cultural background, aesthetic sensitivity, and familiarity with the art form.

These findings can be further understood through a semiotic perspective, in which calligraphy operates as a system of signs. Visual elements function as signifiers, while their meanings are constructed through culturally mediated interpretation. The preference for visually explicit and narratively rich features suggests that young visitors rely more on immediately recognisable symbols rather than abstract formal relationships. This aligns with

theories of visual perception and symbolic interpretation, which emphasise that meaning-making is an active process shaped by prior knowledge and cultural context.

Furthermore, the results support the view from visual culture and heritage studies that audiences are not passive receivers of information but active interpreters of meaning. The varying levels of satisfaction across different attributes indicate that engagement with calligraphy depends not only on the intrinsic qualities of the works but also on the accessibility of their symbolic meanings. When symbolic cues are clear and culturally familiar, visitor engagement is enhanced; when they are abstract or require specialised knowledge, engagement tends to decline.

Overall, this study demonstrates that the appreciation of calligraphy among young visitors is shaped by a dynamic interaction between visual perception, cultural symbolism, and interpretive accessibility. The findings highlight the importance of bridging the gap between formal artistic features and audience understanding, suggesting that both heritage presentation and calligraphy education should place greater emphasis on making symbolic meanings more accessible and interpretable.

Authors’ Contribution

This study makes three main contributions. First, it introduces the concept of calligraphy image symbolism into visitor perception research, providing a new theoretical perspective for understanding calligraphy appreciation. Second, it applies Importance-

Performance Analysis (IPA) to the field of calligraphy and cultural heritage, extending its application beyond traditional service evaluation. Third, the study offers practical insights for calligraphy education and heritage interpretation, particularly in engaging younger audiences.

Implications of the Study

The findings of this study have important implications for both heritage management and calligraphy education.

For heritage management, the results suggest that young visitors are more responsive to visually salient and symbolically accessible features, such as strong brushstrokes and religious or narrative content. Therefore, heritage sites such as the Longmen Grottoes should enhance interpretive strategies that make symbolic meanings more explicit. This may include the use of explanatory panels, digital guides, or interactive media that translate abstract calligraphic features into understandable visual and cultural narratives. By improving the interpretability of calligraphy works, heritage managers can increase visitor engagement and deepen cultural appreciation.

For calligraphy education, the findings highlight a gap between technical knowledge and aesthetic perception among young learners. While traditional teaching often emphasises stroke techniques and structural accuracy, the results of this study indicate that learners are more engaged with visually expressive and symbolically meaningful

elements. Therefore, incorporating visual-symbolic interpretation into teaching practices—such as explaining the cultural meanings behind brushwork styles or encouraging imaginative interpretation—can help bridge the gap between skill acquisition and aesthetic understanding.

More broadly, this study suggests that the effectiveness of calligraphy appreciation depends not only on the intrinsic qualities of the artwork but also on the accessibility of its symbolic meaning. Enhancing interpretive support, both in educational and heritage contexts, is therefore essential for fostering deeper engagement with calligraphy among younger audiences.

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