

The Factors of Religious Architecture Influencing Students' Perception of Beauty and Art: Evidence from Hanoi, Vietnam

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Abstract

This study explores the impact of religious architecture on the aesthetic perceptions of elementary school students in Hanoi, Vietnam, focusing on students majoring in fine arts. Employing regression analysis, the research assesses the influence of six key dimensions: architectural design and details, cultural and historical context, spiritual symbolism, emotional impact, context and setting, and students' perceptions of beauty and art. Data were collected through a structured questionnaire developed from a thorough literature review and expert consultations and administered to a randomly selected sample during Vietnam's Lunar New Year in January 2024. The results revealed that each dimension significantly contributes to students' perceptions of beauty, with context and setting having the most pronounced effect. The reliability of the questionnaire was confirmed via Cronbach's alpha, indicating high internal consistency across all scales. The regression analysis validated the theoretical framework, establishing that religious buildings' architectural and contextual elements significantly shape students' aesthetic judgments. These findings underscore the importance of integrating architectural aesthetics into educational curricula, highlighting how environmental and cultural contexts influence educational outcomes in art and aesthetics. This research contributes to filling a significant gap in understanding the academic impact of cultural heritage, offering significant implications for educational practices and policies in culturally diverse settings.

Keywords: Religious Architecture, Aesthetic Perception, Educational Outcomes, Cultural Heritage, Regression Analysis, Art Education

INTRODUCTION

The relationship between architecture and human perceptions of beauty and art is a broad subject that describes nested phenomena rooted in the socio-cultural and religious fields (Zeki, 2019). Vietnam has a noticeable variety of Buddhist pagodas, Roman Catholic cathedrals, and other sacred buildings. Aside from the spiritual dimension, these constructions also represent cultural phenomena and are used to educate the population aesthetically. The diversity in this field serves as fertile ground for uncovering the influence of religious architecture on Vietnamese students' aesthetic perceptions and artistic sensibility (Alasmar, 2019).

While the general influence of these buildings on the general population is evident, there are few papers on a scholarly level that inquire specifically into their final impact on art and aesthetics education (Britton, 2022). Notably, the connection between religious architectural elements and the subsequent acquisition of beauty and artistic appreciation skills among students is an overlooked topic. Such omissions are striking in the case of Vietnam, especially considering the connection between religious beliefs and cultural practices in developing an education field (Le & Tran, 2023).

This paper aims to fill the gap by investigating and identifying which architectural factors of religious buildings are most influential in developing Vietnamese students' aesthetic judgments and artistic interpretations. The study will search for the factors underlying the field using linear regression analysis. This statistical approach is used to identify the latent factors from observed data. It is best suited for uncovering the patterns beneath the surface of complex data because it might reveal their connection and how they influence the final perceivable outcome.

The most immediate implication of the research is to offer practical advice for education based on the respondents' perception of architectural beauty. By identifying the most significant factors in the process, educators can actively try to integrate them into school and university curricula. The research also has a stronger theoretical contribution potential by identifying the connection between the surface factor and the latent factors

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behind it. Nowadays, the connection between which of the factors was most important and the ways to influence it using education remains to be proved. This concept might further be integrated into a theorist framework and adapted in other studies concerned with a different culture. Regardless of the culture for examination, the potential influence of the environment remains the same.

LITERATURE REVIEW

Architectural Design and Details

Firstly, architectural design and details encompassing physical attributes such as shapes, sizes, and materials, as well as ornamental details such as carvings, mosaics, and stained glass, serve as primary mediators for the transmission of aesthetic values (Ford, 2011). These aspects, being the most immediate and observable aspects of religious architecture, provide direct insight into the physical craftsmanship and artistic creation that pervade sacred spaces (Garlan et al., 1994).

Numerous studies have supported the significance of these elements in their immediate visual impact on a person's perception of beauty and art (Lavdas & Schirpke, 2020). Within the paradigms of psychological literature, this research is predominantly concerned with the effect of architectural forms on human psychology, whereby shapes and sizes deliberately affect the observer's perception, evoking emotional responses and conveying symbolic meaning. For instance, the towering spires of Gothic cathedrals are designed to be tall not just inherently but also due to the deep cultural and spiritual values associated with high things, such as the sky and heaven (Ralls, 2015).

Materials selected by artisans in constructing these mighty edifices, such as stone, speak to the solemnity and grandeur of religious practices and values (Hahn, 2012). In this case, materials are chosen for their strength and durability but also for their ability to represent, culturally and spiritually, a shared ethos. Additionally, ornamental details such as carvings, mosaics, and stained glass offer another visual medium for displaying religious stories and portrayals (Trilling, 2003). These are constructed to give spectators and practitioners a way to incorporate aesthetic values into their spiritual experiences. Stained glass windows, for example, act as both light-providing elements in Catholic churches and a narrative form of biblical stories and saintly figures. Indeed, these elements are not constructed as purely aesthetic artwork but are narratively imbued images that give a holistic view of the church's cosmology (Gourlay, 2017).

Several empirical studies have also provided evidence to validate the educational impact of exposure to such environments in enhancing students' ability to analyze and understand aesthetic depictions. The recommended conclusion here would be that religious architecture's ornamental and physical elements specifically influence individual senses, thus vital in shaping students' aesthetic sensibilities. Hence, this research will seek to investigate the educational impact of these elements within the Vietnamese educational context.

Cultural and Historical Context

The contextual knowledge about a religious building, particularly its background and history, profoundly enriches the student's understanding and appreciation of the building and significantly enhances their perception of beauty and artistic value. Thus, the cultural and historical context is not merely additional information that is included to broaden one's perspective about the building – they are the meaning that changes the religious building from an edifice to a cultural identity and a historical narrative (Starr, 2020).

Empirical studies devote special attention to the importance of knowledge about the reasons behind one building's construction, the era it represented, and the meanings it held in a religious and historical context because it dramatically affects how an individual perceives and values a religious building (Gregor, 1996). For example, once students are familiar with the historical background of the temple they examine, they can deduce what event may have defined its architectural choice.

Integrating contextual knowledge into perception not only makes one value the beauty of the building but also see its socio-political and cultural meanings in the context of the era. The added value of the role as a center of social and spiritual life can be gained by learning about the significance of the temple from the perspective of the Vietnam experience (Na & Park, 2022). On that note, the spiritual value of the building is also significant.

For example, not many people may understand what a particular symbol on a temple's carving means and what spiritual messages it may carry. However, there may be a twofold environment: first, the student who does not understand the basics of the religious context, and second, the ultimate observer who does. The former observes the building with the pleasure of beauty since the carving is beautiful; the latter undergoes an experience of being immersed in the carving's meaning (Vinnikov et al., 2021).

Lastly, one comes to the essentiality of knowledge and interaction with the building. For a student to experience the latter option, he or she must have background knowledge. This particular information defines the nature of education that the individual receives. Thus, the abovementioned aspects are essential to learning educational goals and outcomes. Therefore, the literature indicates the necessity of including these aspects in an educational curriculum so that the student can understand the surrounding sphere of his heritage. This approach enriches their aesthetic experience and fosters a deeper appreciation of their national and cultural identity.

Spiritual Symbolism

Symbols play a vital role in the beauty and artistry of religious architecture. Religious architecture relies on and conveys its symbolism to be comprehensive. The building's meaning goes beyond the blueprint, implying that religion is also present in the building's artistry, meaning, and symbolic design (Iskandar et al., 2023). It is, thus, vital to appreciate symbolism's complexity in architecture due to the following reasons, according to cultural studies and religious education:

Spiritual symbolism, a central element in religious architecture, adds layers of meaning to the form. The symbols used in the building features often represent the culture's or faith community's core beliefs, values, or historical narratives (Tremelin, 2003). The scaffold of symbolism does not have a decorative purpose; it is the formwork of an aesthetic experience with a unique meaning of such towers. Accordingly, spiritual symbolization is a way to intensify one's knowledge of greatness; for example, the lotus motif symbolizes purity and enlightenment in Buddhist temples, representing Buddhists' beliefs that they must rise above physical pain to attain Nirvana (Johnson, 1977).

Symbolism's complexity in religious architecture is an educational tool that allows spectators to profoundly engage with and familiarize themselves with a culture's spiritual heritage. Its complexities can strengthen one's awareness of one's consciousness and surroundings. Everyone can be more profoundly aware of how Buddhism, Christianity, and Catholicism differ if they understand how Buddhism differs from Catholicism (Tremelin, 2003). Therefore, decoding the symbols in the pagoda can develop a student's desire to understand what more dragons may exist in the divine faith. It can increase the individual's admiration of an owl, making them want to learn more about how it intrinsically distinguishes from the bat.

Every personal iconography symbol or attention-controlled individual wants to advance knowledge more deeply. As a result, complexity may kindle intelligence and understanding through an individual's receptivity to a new explanation and potential. This integration would enhance students' aesthetic experiences and deepen their knowledge of the cultural and spiritual narratives that shape their environment, promoting a more inclusive and reflective educational atmosphere.

Emotional Impact

The emotional impact of religious spaces is a critical aspect of how it affects the aesthetic perceptions of viewers. How it "feels" to the observer, in terms of awe, peace, reverence, or contemplation, may influence perceptions of beauty and artistic achievement (Hiçsönmezler et al., 2023). The emotional impact of religious architecture is one of the most influential aspects of its effect on viewers, not only on aesthetic perceptions but also in affecting students' overall attitudes toward the art form (Kulik et al., 2022).

The design of religious spaces is often intentionally arranged to inspire feelings of awe, peace, reverence, or contemplation. These methods are not sided achievements of one's "appreciation," but rather a critical aspect of visiting such a site, wholly responsible for a student's interpretation of this phenomenon (Burchardt et al., 2023). Environmental psychology and architecture scholars have long been fascinated by space and form's emotional influence. Techniques include manipulating size, proportion, light, and material. A cathedral's

grandeur works literally and metaphorically to make visitors marvel at the sublime, a feeling directly associated with something beautiful (Donald, 2022).

The secluded courtyard of a Zen Buddhist temple or the humble hall of a mosque's prayer space promotes feelings of serenity and thoughtfulness. Again, such intended emotions affect aesthetic value, exposing one's current emotions in synergy with religious architecture's spiritual and aesthetic goals. It is by no means accidental that students may reach such powerful feelings (Richardson, 2004). Being in such a state benefits the educational process, allowing students to interact with art and architecture more than passive participants.

Studying this experience is emotionally beneficial, and images can encourage students to feel attached to a structure, helping them appreciate architecture's beauty and artistic integrity (Pallasmaa, 2018). Also, the range of emotions it may cause will allow for a more excellent meditative experience, a necessity when studying the arts. It will enable discussions of mediation, introspection, and awareness about art at the undercurrent level and understanding the beauty of art or art by feeling it (Bianconi et al., 2021).

Educators can feel and apply these nominal feelings to make them comprehend them, helping the student learn all aspects, not just what an art history book will explain. For this reason, emotionality is the most critical aspect of teaching art (Bianconi et al., 2021). Overall, the emotional response to religious architecture is the most vital aspect of how it affects beauty. Moreover, it adds to beauty and educates an emotionally satisfying link to one's cultural future (Kulik et al., 2022). This approach highlights the multifaceted role of architecture in education, where it serves not only as an object of study but also as a profound influencer of emotional and aesthetic experiences.

Context and Setting

The environment in which a religious structure is located also determines its perception. Indeed, a building is not just viewed in a void but rather in the context of its location and setting. As such, when the building is constructed in a serene environment, it will appear beautiful (Barrett et al., 2014). In contrast, the building may seem disorganized when the surroundings are cluttered or chaotic. The geographical setting in which architecture is located, and the surrounding landscape profoundly influence our perception of it (Bell, 2012).

Numerous studies in environmental aesthetics and architectural theories argue that everything around a building, including the landscape, influences its aesthetics (Nasar, 1992). In this regard, it is critical to note that integrating architectural considerations within the landscape is not by coincidence but a deliberate design factor that makes the building beautiful (Jam et al., 2017). In addition, many structures are designed in places where the beauty of nature adds to the environment. For example, a temple is expected to be erected in the middle of a plain surrounded by mountains (Scully, 2013). This context adds to the sacredness and visual beauty of the building. Therefore, architectural beauty is determined by both the building and what surrounds it.

Concerning maintaining the environment, it is essential to note that a well-maintained garden or building exterior is serene to the mind. This optimal environment is meditative, which also complements the spiritual design aspect of the building. A meditative environment is beautiful because it makes the mind feel at peace .

Context and setting are among the most critical features that affect perception. This is particularly so in educational contexts, where the surrounding setting affects the experience (Gobster et al., 2007). The condition and aesthetic of the surrounding setting in which students come in contact with religious architecture can affect their willingness to engage with and appreciate the art (Berleant, 1997). The aesthetically pleasing setting positively influences students to explore and think about the architectural works more in-depth, benefiting their education of these pieces. Moreover, the long-term interaction between architectural works and their surrounding setting is another major research topic in architecture and landscape architecture (Francis, 2001). Because this interaction reflects a larger cultural and historical story, it can help audiences relate the architectural work to the immediate surroundings and a society's cultural heritage and historical link.

Educating students on context and setting gives them a complete understanding of how the setting influences their perception and engagement with architectural art. This offers students more comprehensive access to

beauty and design and a natural insight into how a setting in the form of an environment interacts with architectural works to develop meaningful buildings.

Based on literature reviews, the following hypotheses are proposed:

Hypothesis 1 (H1): Architectural design and details positively and meaningfully impact students' perception of beauty and art.

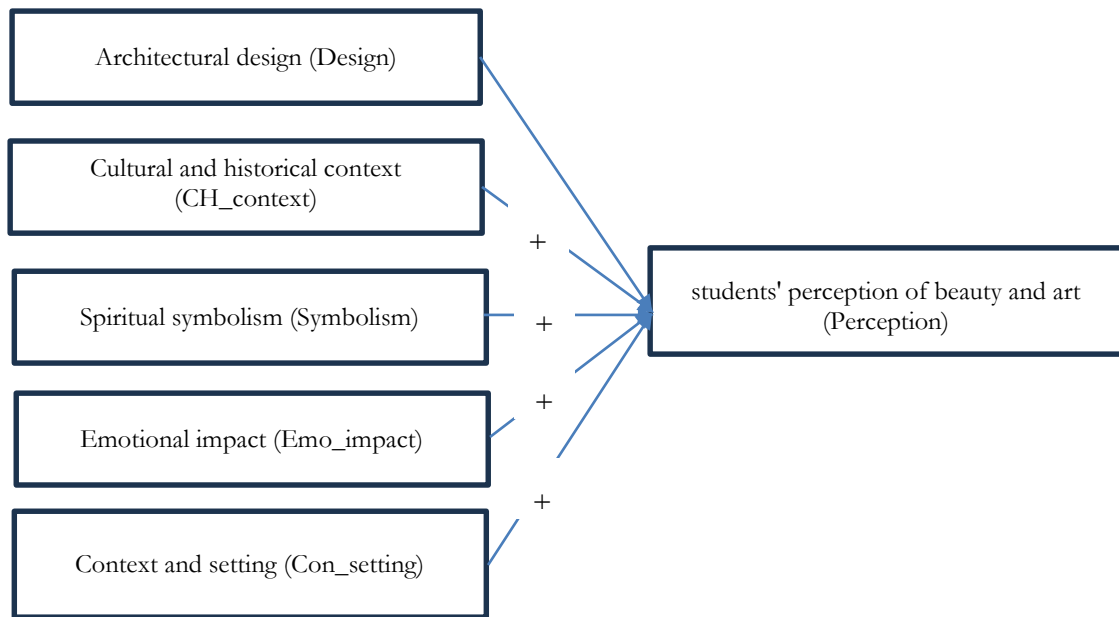
Hypothesis 2 (H2): Cultural and historical context has a positive and meaningful impact on students' perception of beauty and art.

Hypothesis 3 (H3): Spiritual symbolism has a positive and meaningful impact on students' perception of beauty and art.

Hypothesis 4 (H4): Emotional impact has a positive and meaningful impact on students' perception of beauty and art.

Hypothesis 5 (H5): Context and setting have a positive and meaningful impact on students' perception of beauty and art.

Based on the research hypotheses, the following research model is proposed:



METHODOLOGY

Development of the Questionnaire

The questionnaire was meticulously developed based on an extensive review of relevant literature and through consultation with two educational experts specializing in art and architectural education (Tuan et al., 2005). The aim was to construct a comprehensive survey tool that would effectively capture the nuances of students' perceptions of religious architecture's influence on their aesthetic appreciation. Questions were designed to measure both cognitive and emotional responses to architectural elements, the impact of historical and cultural context, and personal reflections on the spiritual symbolism of the structures.

Pilot Survey and Refinement

Before the primary survey was conducted, a pilot survey was administered to a small group of fine arts students from universities in Hanoi. The purpose of the pilot was to test the clarity, relevance, and impact of the questionnaire items (Williams et al, 1999). Feedback obtained from this initial group was crucial for refining the

questions to ensure they were understandable and effectively targeted the research objectives. Adjustments were made to enhance the flow of the questionnaire and to address any ambiguities that were identified during the pilot phase.

Participant Selection and Data Collection

Participants for the primary survey were selected using a random sampling method. The subjects comprised fine arts students studying at various universities in Hanoi, a city renowned for its ancient religious architecture (Wang et al., 2017). This demographic was chosen because of their educational background in art and their potential heightened sensitivity to aesthetic and architectural elements. Data collection was scheduled for January 2024, during Vietnam's Lunar New Year, a period anticipated to be rich in cultural and religious activities, providing a vibrant context for the survey (Table 1).

Ethical Considerations

The study adhered to strict ethical guidelines to ensure the integrity and respectfulness of the research process. Participants were informed about the purpose of the study and the use of the data collected, ensuring transparency. Consent was obtained from all participants, who were assured of their anonymity and the confidentiality of their responses (Arifin, 2018). Participants were also informed that their involvement was voluntary and that they could withdraw from the study at any time without any consequence (Iseselo & Tarimo, 2024). These measures were implemented to uphold the ethical standards of research and protect all participants' rights and well-being.

Table 1 Demographic characteristics of survey participants

		Religious_Affiliation					
		Buddhism		Other		Protestantism	
		Count	Row N %	Count	Row N %	Count	Row N %
Age	22 years old	19	51.4%	9	24.3%	9	24.3%
	18 years old	12	48.0%	5	20.0%	8	32.0%
	19 years old	9	37.5%	6	25.0%	9	37.5%
	20 years old	41	49.4%	9	10.8%	33	39.8%
	21 years old	16	51.6%	6	19.4%	9	29.0%
Gender	female	14	50.0%	3	10.7%	11	39.3%
	male	83	48.3%	32	18.6%	57	33.1%
Grade_Level	A	23	54.8%	3	7.1%	16	38.1%
	B	36	46.2%	17	21.8%	25	32.1%
	C	27	48.2%	12	21.4%	17	30.4%
	D	11	45.8%	3	12.5%	10	41.7%
Ethnic_Background	Kinh	76	47.2%	29	18.0%	56	34.8%
	Other	21	53.8%	6	15.4%	12	30.8%
Residential_Location	Rural area	40	48.8%	14	17.1%	28	34.1%
	Suburban area	17	45.9%	9	24.3%	11	29.7%
	Urban area	40	49.4%	12	14.8%	29	35.8%
Previous	Visited historical or religious buildings with my family or school	26	55.3%	5	10.6%	16	34.0%
	Visited a museum or art gallery	25	47.2%	7	13.2%	21	39.6%
	Visited historical or religious buildings with my family or school	27	47.4%	16	28.1%	14	24.6%
	Watched movies or documentaries about art or architecture	19	44.2%	7	16.3%	17	39.5%
Parental_Education	High school	26	54.2%	9	18.8%	13	27.1%
	University degree	53	44.5%	19	16.0%	47	39.5%
	Vocational school or some college	18	54.5%	7	21.2%	8	24.2%

RESULTS AND DISCUSSION

Results

Reliability Analysis

To ensure the reliability of the questionnaire used in this study, a Cronbach's alpha coefficient was employed to assess the internal consistency of the survey items for each latent variable. Cronbach's alpha is a widely recognized measure of scale reliability, with values ranging from 0 to 1, where higher values indicate greater internal consistency among the items that comprise the scale. Generally, an alpha coefficient of 0.70 or above is considered acceptable for research purposes, indicating good reliability (George & Mallery, (2018).

Table 2 Summary of Reliability

Scales	Number of variables observed	Reliability (Cronbach Alpha)	coefficients The correlation coefficient of the smallest total variable
Design	4	0.776	0.546
CH_context	4	0.789	0.576
Symbolism	4	0.795	0.550
Emo_impact	4	0.754	0.617
Con_setting	4	0.770	0.541
Perception	4	0.774	0.529

In this study, all latent variables—architectural design and details, cultural and historical context, spiritual symbolism, emotional impact, context and setting, and students' perception of beauty and art—achieved Cronbach's alpha values exceeding 0.70, thereby confirming the reliability of the instrument in measuring the constructs of interest (Table 2). This strong reliability underscores the robustness of the questionnaire, supporting its validity in capturing the nuanced perceptions of students regarding religious architecture and its aesthetic implications.

Factor Analysis

This study utilized exploratory factor analysis (EFA) to identify the underlying structure of the relationships between observed variables and the corresponding latent constructs related to students' perceptions of religious architecture (Stapleton, 1997). EFA is particularly suitable for research where the specific number or nature of latent variables is not predetermined, allowing for discovering patterns among variables that suggest potential factors. The criteria for applying EFA in this research involved ensuring a sufficient sample size, with a commonly recommended ratio of at least five respondents per item, and verifying the suitability of the data for factor analysis through the measure of sampling adequacy (Kaiser-Meyer-Olkin test) and Bartlett's test of sphericity. The Kaiser-Meyer-Olkin measure exceeded the minimum acceptable value of 0.6, and Bartlett's test was significant ($p < 0.05$), indicating that the dataset was appropriate for conducting EFA. Factors were extracted using the principal component analysis method, and a Varimax rotation was applied to achieve a more straightforward, more interpretable structure with clear factor loadings. Only factors with eigenvalues greater than one were retained, in line with the Kaiser criterion, to ensure that each factor explained a substantial amount of variance. This rigorous application of EFA affirmed the proposed theoretical constructs and refined the scale by identifying the most salient items representing each latent variable.

Table 3 Result of factor analysis

Rotated Component Matrix						
	Component					
	1	2	3	4	5	6
Design2	.744					
Design3	.726					
Design4	.665					
Design1	.592					

Con_setting4		.754				
Con_setting2		.642				
Con_setting3		.606				
Con_setting1		.552				
CH_context3			.747			
CH_context2			.736			
CH_context1			.662			
CH_context4			.630			
Symbolism2				.718		
Symbolism3				.700		
Symbolism1				.678		
Symbolism4				.660		
Perception4					.757	
Perception1					.677	
Perception2					.628	
Perception3					.556	
Emo_impact1						.731
Emo_impact2						.660
Emo_impact4						.589
Emo_impact3						.582
Extraction Method: Principal Component Analysis.						
Rotation Method: Varimax with Kaiser Normalization.						
Rotation converged in 7 iterations.						
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)=0.925						
Bartlett's Test of Sphericity (Chi-Square= 1904.759; df=276, sig.=0.000)						
Extraction Sums of Squared Loadings = 61.608						
Initial Eigenvalues = 1.018						

Table 3 presents the results of the factor analysis that was conducted to validate the research questionnaire. Bartlett's test of sphericity was statistically significant (Sig. = 0.000), and the KMO = 0.925 (>0.5), indicating that the observed variables are correlated in the population and are, therefore, suitable for factor analysis. The factor loading coefficients for all variables ≥ 0.5 indicate the validity of the factor analysis. Table 3 shows that all variables have factor loading coefficients ≥ 0.5 , demonstrating the validity of the factor analysis. The total load squared extraction for the six factors = 61.608% (>50%), indicating that the extracted factors can explain significant variance in the data. The initial eigenvalue of the six factors = 1.018 (> 1.00), indicating that the extracted factors have eigenvalues more significant than one and are, therefore, valid. These results demonstrate the suitability and validity of exploratory factor analysis for the proposed research model (Shrestha, 2021).

Correlation Analysis

Pearson correlation analysis assesses linear relationships between variables, guiding the preparation for regression analysis (Zou et al., 2003). Critical criteria to ensure the validity of the regression analysis include linearity, homoscedasticity, minimal multicollinearity, regular distribution of data, and controlled outliers (Schober et al., 2018). Adhering to these criteria guarantees precise modeling of factors influencing migration decisions, thereby facilitating the derivation of actionable insights (Gogtay & Thatte, 2017). As illustrated in Figure 2, the analysis outcomes reveal that the margins exhibit a statistically significant correlation, with a p-value = 0.000. This significant correlation underscores the validity of proceeding with regression analysis for both the independent and dependent variables.

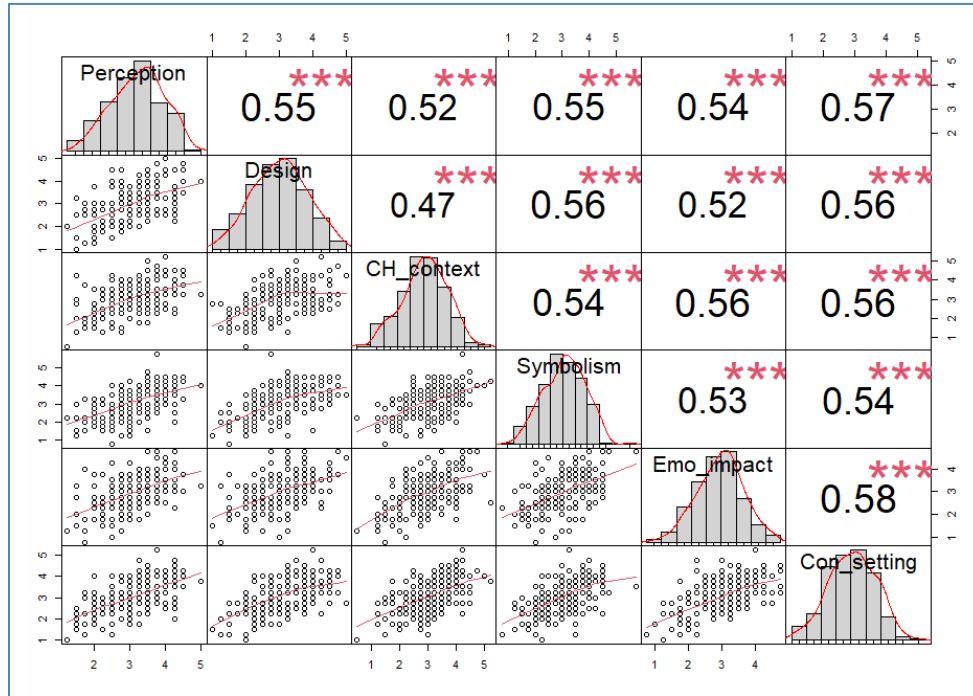


Figure 2 Correlation analysis results

Multivariate Linear Regression Analysis

The application of multiple linear regression analysis in this study aims to dissect labor migration dynamics by examining the relationships between various independent variables and a single dependent variable (Uyanik & Güler, 2013). For the analysis to uphold validity, it is imperative to meet stringent numerical criteria: the relationship between the dependent variable and each independent variable must be linear, evidenced by scatterplots; the residuals should demonstrate homoscedasticity, with no discernible pattern when plotted against predicted values; independence of errors, verified by a Durbin-Watson statistic ideally ranging between 1.5 and 2.5 to suggest minimal autocorrelation; absence of multicollinearity among independent variables, with a Variance Inflation Factor (VIF) less than 10 indicating low multicollinearity; and normally distributed residuals, ascertained by a Shapiro-Wilk test with a p-value greater than 0.050 (Banerjee, 2014). Adhering to these numerical benchmarks is critical for ensuring the precision and validity of the regression analysis, thereby offering credible insights into the factors driving labor migration.

Table 4 results of regression analysis

Dependent variable:	
Perception	
Model	
Design	0.118*** (0.065)
CH_context	0.113* (0.063)
Symbolism	0.160** (0.063)
Emo_impact	0.157** (0.069)
Con_setting	0.183*** (0.070)
Constant	0.655*** (0.191)
Observations	200
R2	0.475

Adjusted R2	0.462
Residual Std. Error	0.561 (df = 194)
F Statistic	35.161*** (df = 5; 194)
VIF:	Design = 1.75 , CH_context = 1.79, Symbolism = 1.82, Emo_impact = 1.85, Con_setting = 1.95,
Note:	*p<0.1; **p<0.05; ***p<0.01

The results of the multivariable linear regression analysis (Table 4) indicate that the regression model is valid to explain the results, as evidenced by the statistical significance of the F-test (p.value = 0.000, df = 5; 194) (Hair et al., 2019). The model also does not have multicollinearity, as the variables in the model have a VIF < 1.838. This suggests that the variables are not highly correlated, and the regression coefficients can be estimated with high precision.

Hypothesis Test

The regression analysis reported in Table 4 yields significant insights into the influence of various aspects of religious architecture on students' perceptions of beauty and art. The data support each tested hypothesis, affirming the proposed relationships with statistical significance.

Architectural design and details are shown to positively impact students' aesthetic perceptions. The regression coefficient for this variable is 0.118, and the associated p-value is less than 0.001, indicating a robust and statistically significant effect. Accordingly, the H1 is accepted.

The role of cultural and historical context is also substantiated with a positive regression coefficient of 0.113 and a p-value of 0.005. This finding supports the H2 that cultural and historical contexts significantly enhance students' appreciation of beauty and art in religious architecture.

Spiritual symbolism, with a regression coefficient of 0.160 and a p-value of 0.001, similarly demonstrates a meaningful and positive effect on how students perceive beauty and art. Thus, the H3 is validated, confirming the significant influence of spiritual elements embedded in architectural designs.

Emotional impact, evaluated through its regression coefficient of 0.157 and a p-value of 0.001, significantly affects students' perceptions, supporting the H4. This underscores the importance of emotional responses evoked by religious architecture in shaping aesthetic appreciation.

Finally, the context and setting where the religious structure is situated show the most substantial impact, with a regression coefficient of 0.183 and a p-value less than 0.001. The acceptance of the H5 indicates that the environmental context is critical in influencing students' perception of architectural beauty.

Collectively, these results validate the hypothesized impacts of architectural design and details, cultural and historical context, spiritual symbolism, emotional impact, and context and setting on students' perceptions of beauty and art in religious architecture. As the statistical analysis indicates, each factor contributes significantly to shaping educational experiences and aesthetic evaluations among students.

DISCUSSION

This study significantly contributes to a more comprehensive understanding of how different aspects of religious architecture affect elementary school students' perceptions of beauty and art (Ralls, 2015). Firstly, the main results of the regression analysis point to the significant roles played by architectural design and details, cultural and historical particularities, spiritual symbolism, emotional vividness, and the context and setting. It is important to note that all of these factors are marked as statistically relevant and positively associated with the dependent variable; at the same time, the context and setting significantly influence children's performance among the four considered aspects (Ford, 2011).

Before the present study, there was a lack of direct empirical evidence relevant to the effect of religious architecture on students' aesthetic and beauty perceptions, particularly in the Vietnamese educational environment. Although much research has been dedicated to such architecture's religious or spiritual meanings

or its historical and cultural dimensions, direct educational effects have not received sufficient attention (Vinnikov et al., 2021). The current research addresses this gap and provides quantitative evidence of how each of the defined factors contributes to shaping aesthetic assessments in young pupils.

This empirical evidence contributes to the existing scholarship on educational outcomes by linking them to architectural characteristics, which had not been studied previously. The results can be practically applied to educational practices, particularly art education and curricula dedicated to cultural heritage (Iskandar et al., 2023). Knowing the effects of specific aspects of religious architecture on students' perceptions of beauty, teachers can design more effective educational programs that utilize these factors. For example, the role of design details, the influence of spiritual symbolism, and the importance of cultural history can be explained to pupils during various field excursions.

The strong meaning of context and setting for the overall success of educational efforts suggests the importance of the physical state and location of religious buildings. This variable can, therefore, guide the development of policies and practices regarding the maintenance of historical heritage sites or the construction of educational spaces.

These findings can motivate other studies in other disciplines focusing on the influence of environmental and architectural aesthetics on children's cognitive and emotional development. Thus, this study closes a research gap and provides practical guidance for improving educational practices with the help of cultural and architectural resources. The findings support the development of aesthetic education that integrates cultural heritage to help students develop more robust and comprehensive perceptions of art and beauty.

CONCLUSION

The present study has successfully tackled an important and previously underexamined research area in the field of educational studies – the impact of religious architecture on students' perception of beauty and art. Given the importance of cultural heritage for the formation of aesthetic background, especially in the diverse and unique case of Vietnam, it was crucial to investigate the role of the architectural elements of religious buildings in student's education.

The context of Vietnam, where local and religious heritage is an inclusive part of daily life and education, makes it crucial to research the influence of religious architecture on student's perception of aesthetics. With the help of exploratory factor analysis, the current study has adequately studied the factors of architectural design and details, cultural and historical background, spiritual and emotional considerations, and context and setting as enhancers of student's aesthetic evaluation. The results have shown the significantly positive influence of all the factors and the strongest influence of context and setting on students' aesthetic perception of beauty.

The importance of the current study provides not only a valuable contribution to scientific knowledge but also has practical implications for education strategy and cultural heritage implementation policies. The study findings support the practice on incorporating art and cultural heritage education, which enhances students' experiences and their understanding of appreciation of cultural roots.

As for the limitations of the research, one should note that the sample has been restricted to elementary students of Hanoi which limits the generalization of the findings for a wider and older demographic. Moreover, the questionnaire and self-reporting data may lead to biases and inaccuracies in the student's perception of the influencing factors.

In the future, it would be recommended to diversify the demographic of the sample with ages and regions in Vietnam, as well as other similar contexts. It would also be valuable to employ qualitative methods to understand better students' subjective experiences and psychological mechanisms (Thanh et al., 2021). Future studies may also conduct longitudinal studies to trace changes in perception, which will provide a better understanding of the dynamic of the influence of religious architecture (Thanh et al., 2023).

In sum, the present research is valuable for educational studies, provides a foundational outlook for several future studies, and validates the necessity of maintaining and integrating religious and cultural heritage in the educational program to foster culturally aware and rounded students.

REFERENCES

- Alasmar, R. (2019). Philosophy and perception of beauty in architecture. *American Journal of Civil Engineering*, 7(5), 126–132.
- Arifin, S. R. M. (2018). Ethical considerations in qualitative study. *International journal of care scholars*, 1(2), 30-33.
- Banerjee, A. V., & Duflo, E. (2014). Do firms want to borrow more? Testing credit constraints using a directed lending program. *Review of Economic Studies*, 81(2), 572-607.
- Barrett, N. F. (2014). The perception of religious meaning and value: An ecological approach. *Religion, Brain & Behavior*, 4(2), 127-146.
- Bell, S. (2012). *Landscape: pattern, perception and process*. Routledge.
- Berleant, A. (1997). *Living in the landscape: Toward an aesthetics of environment*. University press of Kansas.
- Bianconi, F., Filippucci, M., Magrini, G., & Seccaroni, M. (2021). Designing with emotional awareness. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 46, 55-62.
- Britton, K. C. (2022). Overview of Religious Art and Architecture: Native American. In *Oxford Research Encyclopedia of Religion*.
- Burchardt, M., Martínez-Ariño, J., Griera, M., & Bramadat, P. (2023). Rite and stone: Religious belonging and urban space in global perspective. *Space and Culture*, 26(2), 148-154.
- Donald, I. (2022). *Environmental and architectural psychology: The basics*. Routledge.
- Ford, E. R. (2011). *The architectural detail*. Chronicle Books.
- Francis, M. (2001). A case study method for landscape architecture. *Landscape Journal*, 20(1), 15–29.
- Garlan, D., Allen, R., & Ockerbloom, J. (1994). Exploiting style in architectural design environments. *ACM SIGSOFT software engineering notes*, 19(5), 175-188.
- George, D., & Mallery, P. (2018). Reliability analysis. In *IBM SPSS statistics 25 step by step* (pp. 249-260). Routledge.
- Gobster, P. H., Nassauer, J. I., Daniel, T. C., & Fry, G. (2007). The shared landscape: what does aesthetics have to do with ecology?. *Landscape ecology*, 22, 959-972.
- Gogtay, N. J., & Thatte, U. M. (2017). Principles of correlation analysis. *Journal of the Association of Physicians of India*, 65(3), 78-81.
- Gourlay, A. (2017). *Things left behind: matter, narrative and the cult of St Edmund of East Anglia* (Doctoral dissertation, University of Glasgow).
- Gregor, R. (1996). *The empirical development of a curriculum on the issues concerning the history of ancient Israel*. Andrews University.
- Hahn, C. J. (2012). *Strange beauty: issues in the making and meaning of reliquaries, 400-circa 1204*. Penn State Press.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, 31(1), 2-24.
- Hiçsönmezler, İ., Kunduracı, A. C., & Ek, F. İ. (2023). The Perception of Spatial Atmosphere in Traditional and Modern Mosques in Aesthetic Context: Spatial Atmosphere in Traditional/Modern Mosques. *Tasarim+ Kuram*, 19(38), 16-39.
- Jam, F. A., Sheikh, R. A., Iqbal, H., Zaidi, B. H., Anis, Y., & Muzaffar, M. (2011). Combined effects of perception of politics and political skill on employee job outcomes. *African Journal of Business Management*, 5(23), 9896-9904.
- Isele, M. K., & Tarimo, E. A. (2024). Comprehension of informed consent and voluntary participation in registration cohorts for phase IIb HIV vaccine trial in Dar Es Salaam, Tanzania: a qualitative descriptive study. *BMC Medical Ethics*, 25(1), 29.
- Iskandar, I., Zacky, Z., Isti, A. R., Agustiananda, P. A. P., & Budiman, H. (2023). The Role of Light In The Architecture of Religious Buildings. *Devotion: Journal of Research and Community Service*, 4(3), 693-703.
- Johnson, B. (1977). Sociological theory and religious truth. *Sociological Analysis*, 38(4), 368-388.
- Kulik, M. M., Rutyna, H., Steć, M., & Wendołowska, A. (2022). Aesthetic and Educational Aspects of Contact with Contemporary Religious Architecture. *Religions*, 13(5), 418.
- Khan, T. I., & Akbar, A. (2014). Job involvement-predictor of job satisfaction and job performance-evidence from Pakistan. *World Applied Sciences Journal*, 30(30), 8-14.
- Lavdas, A. A., & Schirpke, U. (2020). Aesthetic preference is related to organized complexity. *PLoS One*, 15(6), e0235257..
- Le, T. S., & Tran, D. T. (2023, May). Tradition as innovative opportunities for contemporary Vietnamese architecture. In *AIP Conference Proceedings* (Vol. 2560, No. 1). AIP Publishing.
- Na, L. T. H., & Park, J. H. (2022). Cultural heritage values and underlying spatial characteristics of the Temple of Literature in Vinh Long, Southern Vietnam. *Open House International*, 47(2), 282-295.
- Nasar, J. L. (Ed.). (1992). *Environmental aesthetics: Theory, research, and application*. Cambridge University Press.
- Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., ... & Gakidou, E. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The lancet*, 384(9945), 766–781.

- Pallasmaa, J. (2018). Architecture as experience: the fusion of the world and the self. *Architectural research in Finland*, 2(1), 9-17.
- Jam, F., Donia, M., Raja, U., & Ling, C. (2017). A time-lagged study on the moderating role of overall satisfaction in perceived politics: Job outcomes relationships. *Journal of Management & Organization*, 23(3), 321-336. doi:10.1017/jmo.2016.13
- Ralls, K. (2015). *Gothic Cathedrals: a guide to the history, places, art, and symbolism*. Nicolas-Hays, Inc..
- Richardson, P. (2004). *New sacred architecture*. Laurence King Publishing.
- Scully, V. (2013). *The earth, the temple, and the gods: Greek sacred architecture*. Trinity University Press.
- Şenyiğit, Ö., & Yılmaz, N. (2021). An awareness experience by empathic design method in architectural design education. *ICONARP International Journal of Architecture and Planning*, 9(1), 242-260.
- Stapleton, C. D. (1997). Basic Concepts in Exploratory Factor Analysis (EFA) as a Tool To Evaluate Score Validity: A Right-Brained Approach. <https://eric.ed.gov/?id=ED407419>
- Starr, J. (2020). Writing the Landscape: Exposing Nature in French Women's Fiction 1789-1815 by Christie Margrave. *Women in French Studies*, 28(1), 147-148.
- Thanh, N. N., Hiep, H. D., & Tung, P. H. (2021). Relationship between characteristics and university intention: a case study of students in Vietnam. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(18), 44-69.
- Thanh, N. N., Thuy, N. T., Thao, B. T., & Huong, H. T. T. (2023). Policies for Religious and the Practice of Burning Votive Papers for the deceased: a survey in Vietnam. *Synesis (ISSN 1984-6754)*, 15(2), 208-222.
- Tremlin, T. (2003). Thought and Emotion in the Scientific Study of Religion: A Critical Review of Ilkka Pyysiäinen's *How Religion Works*. *Journal of Cognition and Culture*, 3(3), 255-263.
- Tremlin, T. (2003). Thought and Emotion in the Scientific Study of Religion: A Critical Review of Ilkka Pyysiäinen's *How Religion Works*. *Journal of Cognition and Culture*, 3(3), 255-263.
- Trilling, J. (2003). *Ornament: a modern perspective*. University of Washington Press.
- Tuan, H. L., Chin, C. C., & Shieh, S. H. (2005). The development of a questionnaire to measure students' motivation towards science learning. *International journal of science education*, 27(6), 639-654.
- Uyanık, G. K., & Güler, N. (2013). A study on multiple linear regression analysis. *Procedia-Social and Behavioral Sciences*, 106, 234-240.
- Uyanık, G. K., & Güler, N. (2013). A study on multiple linear regression analysis. *Procedia-Social and Behavioral Sciences*, 106, 234-240.
- Vijayanand, S., Vinoth, R., & Sivasathya, K. (2022, September). Protection measures against environmental distress to various structures. In *AIP Conference Proceedings (Vol. 2515, No. 1)*. AIP Publishing.
- Vinnikov, M., Motahari, K., Hamilton, L. I., & Altin, B. O. (2021, May). Understanding Urban Devotion through the Eyes of an Observer. In *ACM Symposium on Eye Tracking Research and Applications* (pp. 1-6).
- Wang, Y., Li, H., & Li, T. (2017). Participant selection for data collection through device-to-device communications in mobile sensing. *Personal and Ubiquitous Computing*, 21, 31-41.
- Williams, E. S., Konrad, T. R., Linzer, M., McMurray, J., Pathman, D. E., Gerrity, M., ... & SGIM Career Satisfaction Study Group. (1999). Refining the measurement of physician job satisfaction: results from the Physician Worklife Survey. *Medical care*, 37(11), 1140-1154.
- Zeki, S. (2019). Beauty in Architecture: Not a Luxury-Only a Necessity. *Architectural Design*, 89(5), 14-19.