Cultural Heritage and Craftsmanship: An In-Depth Analysis of Traditional Thai Ceramics

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Abstract: Background: This study delves into the historical development of Thai ceramics, specifically examining the methods of making, materials used, and patterns of decorations. It aims to showcase the significant role that ceramic artists have played in Thai society. Methods: The research focused on gathering a combination of quantitative and qualitative data. To collect this data, interviews were conducted with craftsmen and artisans from local Thai communities, and direct observation of the ceramics production process was carried out. In addition, the literature on the historical background of Thai ceramics was examined, along with the perspectives of scholars who have offered fresh insights into the evolution of Thai ceramics. Results: The study focused on the processes involved in the production of ceramics in Thailand, as well as their cultural significance. It also highlighted the difficulties artisans face in preserving their connection to the past in a dynamic market that incorporates modern trends into traditional crafts. Conclusion: This study provides a clear explanation of the historical evolution of Thai ceramics and the ongoing efforts to sustain and enhance traditional craftsmanship skills. Furthermore, it provides valuable insights for future research, underscores the importance of preserving these traditions as cultural values, and advances the discussion on the preservation of cultural identity. The study emphasises the significance of transmitting traditional skills to future generations.
Keywords: Traditional Thai Ceramics; Cultural Heritage; Craftsmanship; Historical Evolution; Artisans Sustainability; Thai Society

1. INTRODUCTION

Thai ceramics are known for their traditional nature and rich history.

These ceramics' forms draw inspiration from neighbouring countries like China and India. Advancements in design and construction techniques shape the unique identity of Thai ceramics, making them stand out. The ceramics are highly regarded for their elegant and functional design. They feature stylized decorations, vibrant glazes, and cultural motifs that beautifully capture the religious and social essence of Thailand. Thai ceramics are traditionally handcrafted, involving a significant investment of time and skill (Phuong et al., 2023). Artisans frequently employ traditional methods that have been handed down through multiple generations, sometimes spanning centuries (Liping, 2022). The initial step in this process involves choosing high-quality clay, which is then shaped on a wheel and decorated through painting or carving. Ceramics achieve their polished appearance and strength through a secondary firing process, followed by the application of glaze. Thai ceramics exhibit a modern style that harmoniously complements traditional elements (Sirisuk & Sannong, 2024). In the realm of academia, time-honoured traditions are faithfully preserved and passed down through the ages. Simultaneously, contemporary artisans and craftsmen forge ahead, pushing boundaries and exploring innovative concepts that blend intricate historical design elements with cutting-edge visions (Cheng, 2017). The preservation of Thailand's ceramic craft is crucial in order to uphold its rich cultural heritage. Despite the rise of modernization and the demand for mass-produced goods, the enduring beauty and cultural significance of Thai ceramics remain assured. Through the efforts of individuals, artisans, cultural organisations, and the administration, these traditional practices are being preserved and celebrated (McCarthy, 2020). This impressive creation demonstrates the enduring cultural identity of Thailand, while also showcasing the rich artistic and historical heritage of the Thai people (Zhang et al., 2020). Thai ceramics are exquisite works of art, highly regarded for their cultural significance. They play a crucial role in everyday life and important rituals, serving as essential tools and containers for preparing food and drinks, and also for making religious offerings. These depictions reflect the beliefs, missions, and functions of Thai society, while also serving as symbols of prestige, beauty, and ethnic origin (Zhou & Lu, 2020).

This study offers a comprehensive exploration of the historical evolution of Thai ceramics, along with the efforts made to preserve and enhance traditional craft skills. Section 2 includes a compilation of relevant literature. Section 3 outlines the methodology. Section 4 is discussed in the results. The discussion is provided in Section 5. Section 6 is presented as

the final part of the discussion.

2. RELATED WORKS

The objective of the study was to create a tool for disseminating information about intellectual property and intangible cultural heritage in Thailand's traditional textile and metalworking sectors. These assessments played a crucial role in safeguarding and enhancing intangible cultural heritage. The information about the cultural landscape network (CLN) of Khmer-culture ceramics was created and shared by researchers (Tamponi et al., 2003; Vachirapattarakul et al., Migration Letters). Discussing the current state of the earthenware manufacturing profession and promoting knowledge exchange between the Kingdom of Cambodia and Thailand in the field of Khmer-culture ceramic manufacturing. The exceptional ceramic creations stemming from the Khmer-culture ceramics CLN have garnered global acclaim and widespread appreciation, thanks to the keen interest exhibited by visitors. In the investigation, Hu proposed a technique for creating a virtual ceramic product space model using Virtual Reality Modelling Language (VRML) (Hu et al., 2022). Basically, the process involved utilising 3DS MAX and other three-dimensional modelling tools along with a VRML visual editor to create a VRML model. The page's response time can be optimised to be less than 4 seconds per request, and even during an extended stress test, the system is expected to maintain steady performance with a very low probability of major errors, less than 0.512%. The spectroscopic characterization of ancient burial ceramics made in the kiln of Ban Muang Bua, RoiEt Province (northeastern Thailand) marked a significant milestone in the field of investigation (Won-in, 2019). The three-dimensional tomographic images revealed the interior structure of these samples. It was shown that the combination of various analytical techniques proved to be a powerful tool for addressing the concerns raised by archaeology. The investigation faced significant challenges in determining the timeline of the decline in ceramics production at the Ban Bo Suak site in the Nan region of northern Thailand (Srisunthon et al., 2022). Despite the standard methodological issues, it is evident from the information presented that despite the occurrence of a flood that destroyed several kiln sites, the region's production of ceramics in the Lanna style continued (Zhao, 2018). The investigation aimed to provide guidance on simulating structural equation modelling to enhance the ceramic industry's competitive edge globally. Important inquiries focus

on key issues that arise from the analysis's discoveries regarding the strategic measures needed to enhance the global economic power of the ceramic industry. The investigation conducted by Wei and Cheng examined the innovation and legacy of traditional ceramic technologies in Yuanshui Valley (Wei & Cheng, 2022). Using data simulation, a mechanical model of ceramic technology was created, blending traditional quality and strength with a modern approach to enhance the overall development of ceramic art. In order to foster the advancement of ceramic art, it is crucial to combine the strengths and achievements of the present era with a distinct awareness of staying relevant.

2.1 Hypotheses development

Hypothesis 1: Sustainable improvement and financial support for local communities can be provided through cultural heritage in traditional Thai ceramics.

Hypothesis 2: Traditional Thai ceramic handicrafts can be preserved with the help of cultural heritage.

Hypothesis 3: Cultural heritage enhances intercultural exchange, promoting appreciation and understanding of traditional Thai ceramics and craftsmanship among global audiences.

3. METHODOLOGY

3.1 Data Collection

A comprehensive study was conducted, which involved collecting 60 data samples and conducting interviews with specialists, craftspeople, and experts in the field of Thai ceramics. By recording, classifying, and organising these conversations, one can identify key themes and patterns related to cultural traditions, craftsmanship methods, historic importance, symbolic implications, preservation attempts, modern challenges, and the sociocultural influence of traditional Thai ceramics. Following that, the designs would undergo a thorough examination using thematic analysis, taking into account any implications for understanding and preserving the history of Thai ceramics.

3.2 Sampling

A carefully planned sampling method will be employed, ensuring that participants are selected based on their expertise and ability to offer valuable insights into the research question. Residents from areas known

for traditional Thai ceramics, artists familiar with Thai ceramic techniques, and tourists who have immersed themselves in Thai ceramic culture will be included in the list of invitees. Residents in these areas have a deep understanding of the historical and cultural importance of Thai ceramics, which can greatly contribute to future conservation endeavours. An ongoing connection with traditional artists is essential for fully appreciating the exquisite craftsmanship and expertise involved in creating these ceramics. The opinions of visitors who have experienced Thai ceramic culture reflect a global appreciation for Thai ceramics, highlighting their value on an international scale. The number of samples will be determined based on the level of saturation to ensure a balanced representation of individuals without overwhelming the experiment with extraneous data.

3.3 Statistical Analysis

A significant amount of quantitative data is anticipated to be generated from conducting the survey on Cultural Heritage and Craftsmanship of Traditional Thai Ceramics. The data collected will be analysed using SPSS software. This method involves inputting the data into SPSS for statistical analysis. We will analyse the population composition of the participants by using descriptive statistics, including participant distributions and percentages. These statistical techniques will offer valuable insights into the diverse histories and characteristics of individuals involved in traditional Thai ceramics, shedding light on the cultural heritage and craftsmanship aspects of this field.

4. RESULT

Factor analysis utilises Bartlett's test and the KMO test as statistical methods to analyse the historical development of Thai ceramics. Table 1 presents the distribution of demographic data for the respondents who completed the survey.

Table 1(a): Interview Questionnaires

Question	Responses	Participants	Percentage %
Age	27, 24,33	10	16.5
	35, 42, 50	20	33.5
	35, 42, 50	20	33.5
	60, 70,40	30	50
Gender	Men	38	63.5
	Women	22	36.5

Table 1(b): Interview Questionnaires

Question	Responses	Participants	Percentage %
Education level	Degree	14	23.5
	High School	28	46.5
	Diploma	18	30
Experience level	Entry level	08	13.5
	Mid-level	25	41.5
	Senior Level	27	45
Nationality	Thailand	60	100
Employment status	Un employed	09	15
	Self-employed	15	25
	student	10	16.5
	Full time	26	43.5
Service Feedback	Response time	13	21.5
	Problem resolution	23	38.5
	Product knowledge	24	40
Total		60	100

4.1 Validity Analysis

4.1.1 Bartlett Test

A Bartlett test was conducted. Factor analysis can be conducted if Bartlett's test indicates that the statistical significance of the first hypothesis is less than 0.05. The presence of these variables may indicate that they provide specific information that is not suitable for factor analysis if the initial hypothesis is not eliminated. Table 2 presents the results of the Bartlett test.

Table 2: Result of Bartlett test

Bartlett's test sphericity	
Df	14
Approximate cardinality	32.06
P	0.008 ***

Df – Degree of freedom, *** - 1% level of importance

Factor analysis is conducted by analysing the results of Bartlett's spherical test, which is shown in the table above.

Factor analysis can be conducted when Bartlett's test results indicate statistical significance at a significance level of $P<0.05$. The Bartlett's spherical test yielded a significant p-value of 0.008***, suggesting that the variables are associated and the factor analysis is accurate.

4.1.2 KMO Test

The KMO test was administered. Factor analysis is commonly assessed

using the Kaiser-Meyer-Olkin (KMO) test with a threshold of 0.9. It is preferable to maintain a range between 0.8 and 0.9. A range of 0.7–0.8 is considered optimal. The acceptable range of values is 0.6 to 0.7, while values between 0.5 and 0.6 are considered poor. If the KMO value test shows a relationship of less than 0.5 between the variables being studied, it should be excluded according to factor analysis criteria. Table 3 presents the results of the KMO test.

Table 3: KMO test results

KMO test	
KMO values	0.731

Factor analysis involves analysing the results of the KMO test, as shown in the table above. The variables in the inquiry are deemed to be interrelated and suitable for factor analysis if they pass the KMO test with a value greater than 0.7. The KMO assessment yielded a value of 0.731.

4.2 Reliability Analysis

There is no universally accepted standard for Cronbach's alpha coefficient analysis. However, most academics agree that a value of 0.9 or higher generally indicates better reliability, while values between 0.8 and 0.9, 0.7 and 0.8, and 0.6 and 0.7 indicate progressively better reliability. Values between 0.5 and 0.6 indicate less than acceptable reliability. A reliability coefficient below 0.5–0.6 indicates inadequate reliability, and if it falls below 0.5, it is advisable to consider rewriting the survey. Further examination of the item totals table can determine the questions that contribute to the decrease in overall reliability. If the relationship between the adjusted items and the total is less than 0.3 or if the alpha coefficient after removal significantly increases, the question may be eliminated.Table 4 presents the results.

Table 4: Cronbach's alpha coefficient

Cronbach's alpha coefficient	**0.746**
Standardization of Cronbach's alpha coefficient	0.747
No. of samples	60
No. of items	7

The Cronbach's alpha coefficient of the model is presented in the table above. The outcomes of interest are the number of items, sample size, and the values of the standardised and Cronbach's alpha coefficients. These coefficients are used to evaluate the reliability and quality of the data. Cronbach's alpha coefficient can be used to evaluate the accuracy and

reliability of collected data, particularly in identifying irrational or nonsensical responses. The standardised Cronbach's alpha coefficient is used to standardise scores on different scales. This method is applicable when there is inconsistency in the scores on the scales and when it is necessary to standardise scales with scores of 5 and 10 together for assessment purposes. The total number of variables used in the reliability assessment. The survey's reliability is considered good, as indicated by a Cronbach's alpha coefficient of 0.746 for the model.

4.3 Analyse the Facts

The data evaluation reveals the importance of traditional Thai ceramics and cultural tourism as integral components of cultural heritage. Many participants showed a keen interest in porcelain technology and were supportive of initiatives that aim to preserve local handicrafts. They also acknowledged the strong connection between these crafts and traditional Thai ceramics. It was observed that individuals who possessed expertise in technologies for repairing porcelain were more likely to have travelled to different locations and engaged in cultural tourism. In addition, individuals who are actively involved in preserving porcelain technology are more likely to support measures aimed at safeguarding Thai ceramics. Furthermore, this study found that the participants' recognition of the significance of cultural tourism in preserving traditional arts and crafts has implications for their potential involvement in similar endeavours down the line. Thai traditional ceramics have the potential to become a significant contributor to cultural tourism. They are closely tied to projects that focus on promoting and preserving cultural artefacts, making them a valuable resource in this field. One of the most commonly suggested measures involved promoting an understanding and appreciation of local traditional artworks, as well as encouraging their support and acquisition. Respondents expressed that these programmes would enhance support for conservation activities and raise awareness about the importance of local handicraft production. The analysis's findings support the study hypotheses, highlighting the positive impacts of utilising cultural tourism to preserve Thai artisanal crafts.

5. DISCUSSION

The assessment of differences in mechanical properties and colour of a lithium disilicate ceramic, which has been extrinsically defined through

thermal cycling, brushing, or a combination of both, is crucial (Li, 2017). The microhardness in the glaze firing (GL1) group was found to be significantly improved after five years of thermal cycling ($p = 0.006$). After ten years, the GL1 group showed better performance compared to the GL2 group in terms of thermal cycling plus brushing ($p < 0.05$). The investigation involved the use of various adhesive resins for veneering porcelain and evaluating the impact of surface modifications on the bonding strength between ceramics and machinable ceramics supported by metal. Significant differences in shear bond strength (SBS) ($p \leq 0.05$) were observed among the groups with respect to resin cement, ceramic, and surface treatment. Juntavee et al. found that the bond strength of the bracket to ceramic was influenced by factors such as ceramic surface (Juntavee et al., 2020), ceramic type, and resin cement conditioning. Archaeology has increasingly focused on using energy-dispersive portable X-ray fluorescence for chemical analysis of ceramic fabrics. The previous neutron activation analysis (NAA) identified the main compositional groupings. These groupings could be reproduced by analysing unbroken sherds and pressed planchets, but the ability to differentiate subgroups was compromised due to insufficient detailed information (Juntavee et al., 2020; Marino et al., 2022). The investigation aimed to evaluate the impact of two surface treatments, sandblasting and acid etching, on the shear bond strength (SBS) of newly introduced lithium silicate ceramics reinforced with zirconia. These ceramics were cemented after undergoing thermocycling. The mean value of the hydrofluoric acid group's SBS was 10.81 MPa, which was significantly higher than the mean value of 7.76 MPa for the aluminium oxide sandblasting group, as determined by a t-test (Abdulkader et al., 2021). The study focused on the use of visual shell-related 3D modelling technology and its functional applications. The method employed matching, filtering, and denoising operations to extract corresponding points from the graphical shell, resulting in an accurate 3D visualisation model. This approach provides new perspectives and opportunities for modern ceramic art. Significant differences in mental rotation were observed between the experimental and control groups ($P=0.03$-0.05) (Ye, 2023). The objective of this study was to evaluate the biomechanical properties of endodontically treated incisors that underwent mechanical and thermal ageing and were subsequently repaired with a fibreglass post and lithium-disilicate ceramic crown, with or without a ferrule. The ferrule (Fe) group exhibited significantly higher fracture resistance (N) at 1099.6 ± 214.8 compared to the NFe group's ($675.3 \pm$

113.8) ($p < 0.001$). The fracture resistance root strain ratio was significantly lower in the NFe group compared to the Fe group. The Fe group in the study by Valdivia et al. subjected fibreglass and root dentin to reduced stress (Valdivia et al., 2018). This study aims to evaluate and compare the impact of different materials and methods on the shear bond strength (SBS) of zirconia when veneered with ceramic materials. Abdullah et al. found that group sandblasting accompanied by laser scanning using a Noritake Cerabien ZR (GLN) resulted in the highest SBS values (30.97 ± 3.12 MPa, 29.09 ± 4.17 MPa) (Abdullah et al., 2019), while category sandblasting accompanied by laser scanning with a VITA VM 9 (SLV) resulted in the lowest values (23.96 ± 3.60 MPa, 22.95 ± 3.68 MPa) (P<.05).

6. CONCLUSION

This study investigated the historical background of Thai ceramics, specifically examining production processes, materials, and decorative designs. The aim was to emphasise the significance of ceramic artisans in Thai society. The study confirms the hypotheses regarding cultural heritage and traditional Thai ceramics by establishing the interconnection of variables suitable for factor analysis. This was done through the assessment conducted using KMO and Bartlett's tests. The survey data's reliability is supported by a Cronbach's alpha coefficient of 0.746, which enhances confidence in the survey's results. The results suggest that cultural heritage has the potential to facilitate intercultural communication and generate interest in traditional Thai ceramics. The conventional production method of ceramics can have adverse environmental impacts, such as waste generation and depletion of resources. Striking a balance between tradition and environmental sustainability can pose challenges. Potential future developments in conventional Thai ceramic manufacturing involve integrating sustainable practices to minimise resource consumption and waste production. This equilibrium aims to balance the preservation of tradition, the mitigation of ecological effects, and the promotion of development in Thai ceramics, with the ultimate goal of creating a better future.

References

Abdulkader, K. F., Elnaggar, G. A. E., & Kheiralla, L. S. (2021). Shear bond strength of cemented zirconia-reinforced lithium silicate ceramics (Celtra Duo) with two

surface treatments (in vitro study). *Journal of Adhesion Science and Technology*, *35*(1), 35-51.

Abdullah, A. O., Hui, Y., Sun, X., Pollington, S., Muhammed, F. K., & Liu, Y. (2019). Effects of different surface treatments on the shear bond strength of veneering ceramic materials to zirconia. *The journal of advanced prosthodontics*, *11*(1), 65-74.

Cheng, W. (2017). An analysis of the integration of Chinese traditional patterns and modern design. *Literary Life Literary Theory*, *52*, 123.

Hu, X., Lai, Y., Zhao, D., Tong, F., Hu, Y., & Li, Y. (2022). Ceramic Painting and Traditional Cultural Element Fusion Composition Design Based on Virtual Reality. *Journal of Nanomaterials*, *2022*(1), 3781448.

Juntavee, P., Kumchai, H., Juntavee, N., & Nathanson, D. (2020). Effect of ceramic surface treatment and adhesive systems on bond strength of metallic brackets. *International Journal of Dentistry*, *2020*(1), 7286528.

Li, Q. (2017). The cultural connotation of traditional ceramic decoration and folk crafts: A brief discussion on the traditional decorative patterns of Duihua craft. *Ceramic Science and Art*, *3*, 2.

Liping, L. (2022). A Study of Dali-Sukhothai Cross-cultural Ceramic Art Creation. *Asian Journal of Arts and Culture*, *22*(1), 254415-254415.

Marino, M. D., Stoner, W. D., Fargher, L. F., & Glascock, M. D. (2022). Comparing three sample preparation techniques for portable X-ray fluorescence: A case study of Coarse Orange ceramic jars, Veracruz, Mexico. *Journal of Archaeological Science: Reports*, *41*, 103315.

McCarthy, B. (2020). Examination of processing techniques in cultural heritage objects with radiography. *AMERICAN CERAMIC SOCIETY BULLETIN*, *99*(5), 24-29.

Phuong, N. T. H., Ba, N. T. B., & Tien, L. M. (2023). THE CULTURAL HERITAGE CONSERVATION: A CASE STUDY AT AMPHAWA FLOATING MARKET, THAILAND. Proceeding of International Conference on Innovations in Social Sciences Education and Engineering,

Sirisuk, M., & Sannong, S. (2024). The Balance of Life in Ceramic Design. *International Journal of Designed Objects*, *18*(1).

Srisunthon, P., Mueller, D., & Preusser, F. (2022). Decline of Lanna ceramic group production in northern Thailand (Ban Bo Suak site) confined by radiocarbon and luminescence dating. *Archaeological and Anthropological Sciences*, *14*(8), 149.

Tamponi, M., Bertoli, F., Innocenti, F., & Leoni, L. (2003). X-ray fluorescence analysis of major elements in silicate rocks using fused glass discs. *Atti della Società Toscana di Scienze Naturali, Memorie Serie A*, *107*, 73-80.

Vachirapattarakul, V., Pinsakul, P., Nattratip, W., Chueamklang, K., & Somsaad, P. (Migration Letters). The connection and extended development in making for Khmer ceramics culture: A case study of Thailand and the Kingdom of Cambodia. *Migration Letters*, *20*(5), 1217-1229.

Valdivia, A., Rodrigues, M. d. P., Bicalho, A. A., Van Meerbeek, B., Sloten, J. V., Pessoa, R. S. E., & Soares, C. J. (2018). Biomechanical effect of ferrule on incisors restored with a fiberglass post and lithium-disilicate ceramic crown after thermal cycling and fatigue loading. *J Adhes Dent*, *20*(2), 133-142.

Wei, Z., & Cheng, X. (2022). Inheritance and Innovation of Traditional Ceramics in Yuan River Basin. *Mobile Information Systems*, *2022*(1), 1602312.

Won-in, K. (2019). Identification of Ancient Burial Ceramics from Ban Muang Bua, Northeastern Thailand using SEM-EDS and SR XTM. *Malaysian Journal of Microscopy*, *15*(1).

Ye, Y. (2023). Visualization research of modern ceramic production art based on 3D modeling technology. *Applied Mathematics and Nonlinear Sciences*, *9*(1).

Zhang, D.-P., Xue, D.-S., Liu, Y.-H., Wan, B., Guo, Q., & Guo, J.-J. (2020). Comparative study of three mixing methods in fusion technique for determining major and minor elements using wavelength dispersive X-ray fluorescence spectroscopy. *Sensors*, *20*(18), 5325.

Zhao, Z. (2018). On the application of traditional Chinese auspicious patterns in ceramic decoration. *Literary Life: Late*(5), 1.

Zhou, H., & Lu, M. (2020). The fusion application of ceramic painted decoration and Chinese traditional culture. *Jiangsu Ceramics*, *53*(1), 3.