

Traditional Pottery and Environmental Sustainability: A Critical Evaluation of Production Techniques in Northern Ghana

Ibrahin Yahaya

*Department of Arts and Design Innovation
Tamale Technical University, Tamale, Ghana
Iyahaya155@gmail.com*

Dickson Adom

*Department of Educational Innovations in Science and Technology, Kwame Nkrumah
University of Science and Technology, Ghana
adomdick2@gmail.com/adomdick@yahoo.com*

Joe Adu-Agyem

*Department of Educational Innovations in Science and Technology
Kwame Nkrumah University of Science and Technology, Ghana*

Rudolf Steiner

*Department of Integrated Rural Art and Industry
Kwame Nkrumah University of Science and Technology, Ghana*

Abstract

This study critically examines traditional pottery practices in Northern Ghana through the lens of environmental sustainability and cultural continuity. Pottery, deeply embedded in the region's social and spiritual life, reflects sustainable techniques passed down across generations, utilizing locally sourced clay, natural pigments, and low-emission firing methods. Using a qualitative approach, data were collected through interviews, focus group discussions, and field observations with 30 purposively selected potters from Tamale Metropolis, Sagnarigu, Tolon, and Kumbungu. Findings highlight the ecological value of indigenous production methods, the role of intergenerational knowledge transmission, and artisans' adaptive responses to modern market and environmental pressures. Emerging practices include clay recycling, use of eco-friendly materials, and design innovation to enhance appeal and reduce environmental impact. The study concludes that traditional pottery, when supported through artisan empowerment and policy engagement, offers a viable model for sustainable craft production. It contributes to discussions on indigenous knowledge systems and sustainability in African cultural industries.

Keywords: *traditional pottery, sustainability, indigenous techniques, Northern Ghana, artisan innovation, cultural heritage*

Date of Submission: 11-07-2025

Date of Acceptance: 21-07-2025

I. Introduction

Traditional pottery is an integral part of the cultural fabric of Northern Ghana, playing a central role in the social, spiritual, and economic lives of the region's diverse communities (Dzramedo, 2023; Yussif et al., 2018). Far beyond a utilitarian craft, pottery in this region is a deeply rooted cultural expression that encapsulates the collective memory, heritage, and identity of various ethnic groups, including the Dagomba, Mamprusi, Nanumba, and Kusasi (Derenne et al., 2020; Yussif et al., 2018). These communities have preserved a rich legacy of pottery-making practices transmitted orally and experientially across generations, typically through matrilineal lines. Pottery production is traditionally carried out by women and is steeped in indigenous knowledge systems. It involves not only technical skill but also an intimate understanding of the environment. Clay is sourced locally from designated areas, and tools are often handmade or adapted from natural materials. The firing process,

typically done in open pits using firewood or dry grass, reflects an eco-friendly approach that aligns with rural environmental rhythms and sustainability.

Traditional pottery in Northern Ghana holds both utilitarian and ritualistic significance. Domestic items such as cooking pots, water jars, and storage containers remain indispensable in rural households. Pottery also plays key roles in cultural ceremonies, including libation, ancestral worship, naming ceremonies, and funerals. These objects often carry symbolic meanings, with surface motifs reflecting beliefs, status, or cosmological interpretations (Nortey et al., 2018; Nortey & Asiamoah, 2019).

Economically, pottery contributes significantly to rural livelihoods. Though largely informal, it supports income generation, particularly for women, through sales at local markets. The pottery trade fosters economic resilience and social cohesion through communal production and knowledge sharing.

Despite its cultural significance, traditional pottery faces sustainability challenges driven by modern market demands, economic pressures, and environmental degradation. Artisans are responding by adopting environmentally conscious practices: sourcing local clay and pigments to reduce emissions and boost local economies, recycling pottery waste, and experimenting with fair trade models to improve economic sustainability. Blending traditional aesthetics with contemporary designs also helps artisans reach broader markets, maintaining cultural relevance while improving financial outcomes (Nelson & Shilling, 2018; Fan & Feng, 2019).

The purpose of this study is to critically examine existing indigenous pottery production techniques in Northern Ghana and to understand the interpretations and values attached to these processes by local artisans. Through qualitative methods, including interviews, focus group discussions, and participant observation, the study investigates pottery practices within their social and cultural contexts, seeking to uncover the motivations, perceptions, and experiences of artisans.

II. Literature review

Historical Development of Pottery

Globally, pottery is one of the oldest human crafts, has evolved across cultures for millennia. According to Roux (2019) and Norton (2021), pottery dates back thousands of years and was independently developed in different civilizations, influenced by local materials, needs, and cultural values. Egyptian pottery, for example, was known for its vibrant slip-painted vessels and symbolic motifs, using minerals and plant-based pigments to create durable pieces with spiritual significance (Ren, 2019; Er, 2020; Liard et al., 2022). Firing was done in kilns or pits, with temperature control techniques contributing to the durability and coloration of the pottery (Jones, 2021; Möller & Rieger, 2019).

The Greeks refined pottery with the potter's wheel, enabling symmetrical forms and standardized designs (Hilditch et al., 2021). Greek pottery often featured mythological themes using black-figure and red-figure techniques (Bundrick, 2019). Romans advanced glazing and molding techniques, emphasizing functionality and decoration (Fishman, 2017; Greenberg, 2019).

Historical Development of Pottery in Africa Beyond Egypt

African pottery has a rich and ancient heritage, exemplified by the sophisticated pottery practices of early civilizations such as Egypt. Beyond Egypt, archaeological evidence reveals the existence of pottery in regions like Sudan during the Neolithic period, around 10,000 BCE (D'Ercole, 2021; David et al., 2019). This early pottery tradition was intricately tied to the rise of agriculture and the formation of settled communities across the continent.

As African societies advanced and trade networks expanded, pottery techniques and stylistic expressions evolved accordingly (Shakarov, 2019; Maritan et al., 2023). In West Africa, the Benin Kingdom, flourishing between the 13th and 19th centuries, became renowned for its artistic achievements, particularly the creation of elaborate pottery works. Among these were the pottery vessels called "Benin bronzes," produced using the lost-wax casting technique and characterized by their intricate designs and wide regional distribution (Patch & LaGamma, 2022; Probst, 2022; Sobotka, 2023).

In Nigeria, the Nok culture, which thrived between 500 BCE and 200 CE, developed a distinct pottery tradition. This culture is notable for its mastery in crafting detailed terracotta sculptures and reddish-brown pottery, often adorned with figurative representations of humans and animals (Willcox, 2018; Ehret, 2023).

Meanwhile, along the Swahili coast of East Africa, a unique pottery tradition emerged through sustained interaction with Asian and Middle Eastern cultures. Known as "Swahili pottery," this style incorporated Islamic and Indian influences to produce both functional and aesthetically refined vessels used for storage, cooking, and serving (Alders, 2022; Fredriksen, 2023).

Pottery in Ghana

Different pottery styles, techniques, and functions emerge among different ethnic groups, including the Asante, Fante, Ga-Adangbe, Ewe, Mole Dagombas, Frafra, and Kasina, all of which add to the intricate fabric of Ghanaian craftsmanship (Ghose & Aamir Ali, 2023; Bonsu, 2022).

The various ethnic groups in Ghana showcase diverse pottery traditions, each with its unique characteristics and purposes. In the wisdom of Seidu et al., (2022) and Ankora, (2022) the Asante are known for their intricate weaving and pottery, which incorporates symbolic motifs and elaborate patterns. Fante pottery emphasizes simplicity and functionality, producing utilitarian vessels for daily use. Ga-Adangbe pottery carries spiritual significance, used in rituals and ceremonies to connect with the spiritual realm. Ewe pottery has bold forms and dynamic patterns, representing the vibrant cultural identity of the Ewe people. Mole Dagomba pottery serves practical purposes, such as storage and transportation of goods in the rural economy. Frafra pottery exhibits mastery of form and texture, with intricate carvings and geometric designs reflecting the Frafra aesthetic (Nti, 2024; Nwosimiri, 2021; Saboro, 2022).

Additionally, pottery serves as a medium for storytelling and preserving oral histories, with each piece reflecting the maker's narrative and community. The clay itself holds spiritual importance, believed to embody the earth and ancestors, making pottery production a sacred tradition passed down through generations (Burrows, 2019; McKenzie, 2018). Traditional pottery in contemporary Ghana, continues to thrive alongside modern influences, with artisans adapting ancient techniques to meet contemporary demands while preserving the authenticity and cultural significance of their craft. As guardians of Ghana's cultural heritage, these skilled artisans ensure that the art of pottery remains a vital and cherished aspect of Ghanaian identity for future generations (Iddrisu & Oliveira Lopes, 2024; Sekonopo et al., 2023). In Northern Ghana, especially among the Mole Dagbani, pottery remains vital to domestic, ritual, and economic life (Nyarko et al., 2023). Production is primarily by women using coiling techniques and local clay tempered with grog.

Despite colonial disruptions, traditional pottery has persisted, with recent revivals driven by cultural heritage initiatives. However, artisans still face environmental, economic, and generational challenges.

III. Methodology

This study adopts a qualitative research methodology to examine the indigenous pottery production processes in Northern Ghana. The choice of a qualitative approach is rooted in the study's aim to gain an in-depth understanding of the practices, meanings, and social interpretations that individual potters or pottery-making communities attach to their craft. Qualitative research is particularly suited to this inquiry as it allows for the investigation of human experiences, cultural expressions, and social interactions within their natural settings, elements that are often not adequately captured through quantitative methods (Tracy 2024; Kelly 2023).

IV. Research Design and Scope

The research employed an ethnographic design incorporating participant observation, semi-structured interviews, and focus group discussions. These methods provide a platform for participants to share their lived experiences and cultural knowledge in their own voices. Open-ended questions are employed to elicit rich, descriptive data that reflect the complex realities of pottery production, including the motivations, beliefs, and aesthetic preferences of both artisans and consumers.

Participant observation enables immersion in the field, allowing for the detailed documentation of production processes, tools, materials, and the socio-cultural contexts in which pottery is made and used. In-depth interviews offer insight into individual narratives and subjective interpretations, while focus group discussions facilitate the exploration of collective viewpoints and community-level dynamics. Additionally, visual analysis of pottery forms, designs, and motifs supports the interpretation of concepts and functions of these traditional pottery.

This qualitative approach also prioritizes ethical engagement and cultural sensitivity. By fostering trust and mutual respect between the researcher and participants, the study seeks to co-create knowledge in a manner that values local perspectives and indigenous epistemologies. Ultimately, the methodological framework ensures a nuanced and contextually grounded understanding of traditional pottery practices in Northern Ghana, contributing meaningfully to the discourse on cultural heritage and aesthetic innovation.

Similarly, Tamale Metropolis, Sagnarigu Municipal, Tolon and Kumbungu districts were selected as the target population from the sixteen districts available in the Northern Region of Ghana. Generally, the selection of these samples was based on the availability of research data and their influence on the data collection process. As illustrated in *Tables 2 and 3*, accessible samples of the target population were utilized to facilitate scientific data collection on Northern Ghanaian indigenous pottery traditions, ensuring the development of reliable conclusions.

Fig. 3.1: Map of Northern Region of Ghana with selected areas engaged in pottery production

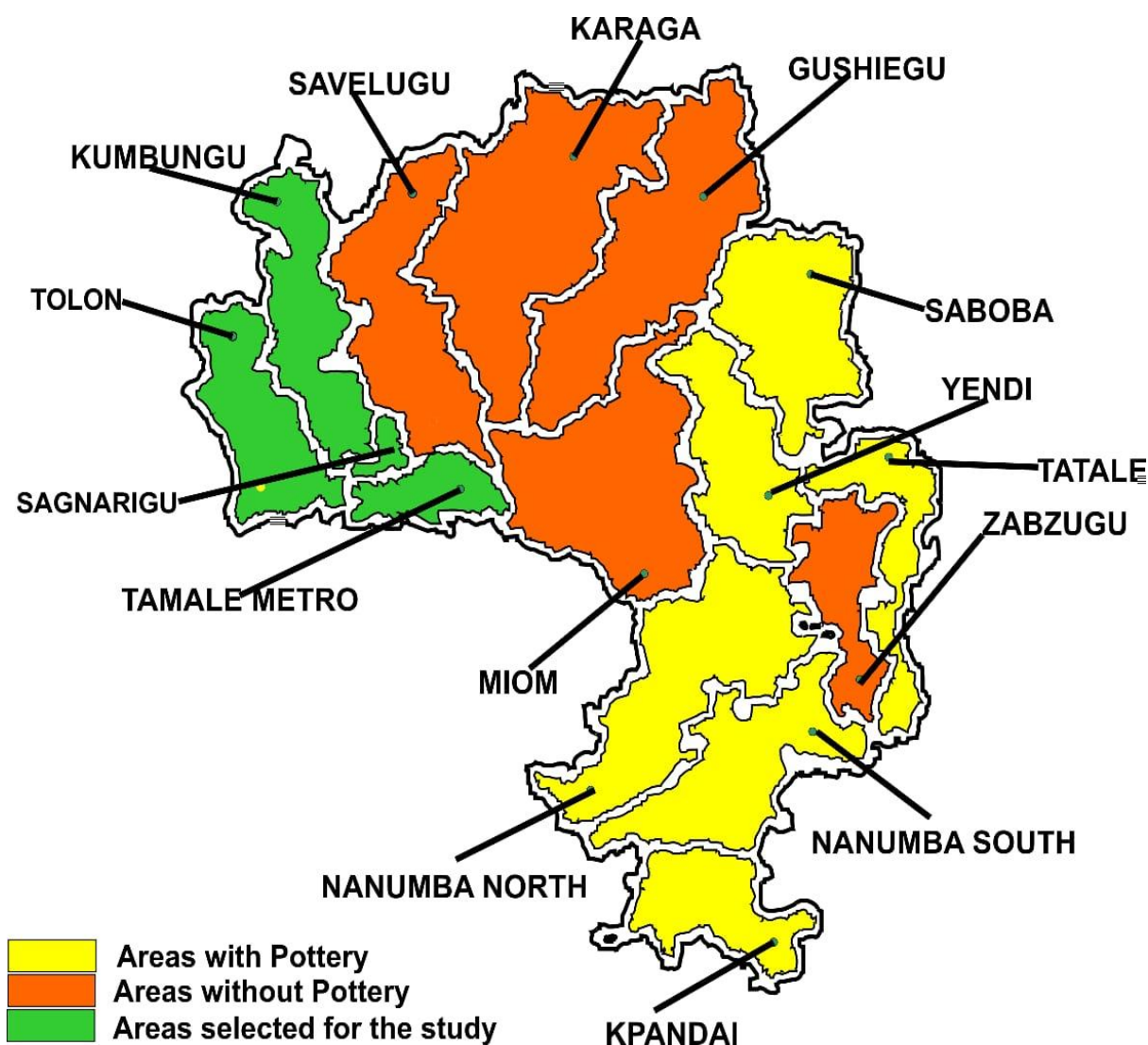


Table 1: Population distribution

S/No.	REGION	DISTRICT	COMMUNITY
1	Northern Region	Tamale Metropolis	Kukuo Community
			Jakarayili Community
			Koblimahgu Community
		Kumbungu District	Logshegu Community
			Kpegu Community
		Tolon District	Gbanjon Community
			Sabiu Community
		Sagnarigu Municipal	Katariga Community
		Savelugu District	
		Nanton District	Dingoni Community
			Nyemandu Community

		Karaga District	
		Gushigu District	
		Mion District	
		Yendi Municipal	Saatimbo Community
			Gnani Community
			Kpanjamba Community
		Saboba District	Nakpeli Community
			Kunkunzoli Community
			Chagban Community
		Zabzugu District	
		Tatali District	Nawalbu Community
			Gbaln Community
		Nanumba North District	Taali Community
		Nanumba South District	Kajeso Community
		Kpandai District	Kuntuli Community
Total		16	21

A well-chosen sample enables valid conclusions and confident generalizations. According to Creswell and Creswell (2018), the term "target population" refers to the full set of people or things that have particular traits in common that are pertinent to the study. However, studying the entire target group is frequently impractical due to limitations including time, resources, and accessibility. Therefore, a subset of the population is chosen to represent the entire population, guaranteeing the generalizability of the results (Stuart et al., 2018; Tin & Bui 2024). The researcher aimed to study a target population of 48 individuals, as indicated in Table 2.

Table 1: Target population distribution

S/No.	DISTRICT	COMMUNITY	SAMPLE SIZE
1	Tamale Metropolis	Kukuo Community	19
		Jakarayili Community	7
		Koblimahgu Community	4
2	Kumbungu District	Logshegu Community	6
		Kpegu Community	4
3	Tolon District	Gbanjon Community	4
		Sabiu Community	3
4	Sagnarigu Municipal	Katariga Community	1
Total		8	48

Identifying all the members of the target population was challenging, so the researcher relied on a few individuals who were readily available and willing to participate in the research. As outlined by Levitt, (2021) and Tracy, (2019) the accessible population refers to the members of the target population who are available for a study, allowing researchers to draw conclusions about the entire target population. Cash et al., (2022) and Khoa et al., (2023) also elaborated that purposive sampling is a strategic approach used in qualitative research to select participants who are particularly knowledgeable about or experienced with the phenomenon being studied. It prioritizes depth of understanding over breadth of representation, allowing researchers to gather rich and relevant data. The final sample size of 30 potters was chosen for the study in order to balance practical and statistical considerations for qualitative research. This volume ensures an in-depth examination of Northern Ghanaian

traditional pottery production by capturing a variety of techniques, aesthetics, and challenges. This is consistent with Tracy's (2024) and Minh's (2025) theoretical saturation principle, which argues that 20–40 individuals should provide rich, contextualized data. When technical limitations like participant accessibility, time, money, and travel are taken into consideration, the scale also makes sense. The selection criteria employed are detailed in *Tables 3*.

Table 2: The Accessible Population (Purposeful Sample and Sample Size).

S/No.	DISTRICT	COMMUNITY	SAMPLE SIZE
1	Tamale Metropolis	Kukuo Community	19
		Jakarayili Community	7
		Koblimahgu Community	4
Total		3	30

Photography offers the advantage of capturing detailed, static moments and can be easily used in various contexts. It helps researchers remember and describe activities, and photographs can illustrate aspects that are difficult to describe verbally. Video, on the other hand, captures sequences of events, providing comprehensive context and including auditory information, which enriches the data (Harvey, 2021; Costa, 2019). The data used to generate the study's findings comprised the recorded verbalizations of traditional potters and pottery users during observational sessions, transcribed interviews, photographs, and audio/video recordings. These materials were subjected to both comparative and cognitive analysis to derive the research results.

The researcher employed semi-structured and unstructured interviews, key qualitative research methods, to gain a deeper understanding of traditional pottery production in Northern Ghana. As noted by Momade (2022) and Osborne (2023), semi-structured interviews provided a flexible yet structured approach, allowing for the exploration of essential themes such as raw material sourcing, forming techniques, surface decoration, and receptiveness to aesthetic innovations. Love and Randolph (2024) and Roulston (2021), also observed that unstructured interviews facilitated open-ended discussions, allowing participants to share their experiences freely and offering rich, nuanced narratives on the cultural and historical contexts of pottery traditions. Engaging directly with potters provided valuable insights into their craftsmanship, perspectives on innovation, and concerns regarding sustainability. While interviewing pottery users helped uncover market preferences and functional expectations, contributing to a broader understanding of pottery's role in contemporary society (White & Adu-Ampong 2024; Speight 2019).

The research emphasizes the importance of ethical practices in data collection, prioritizing participant safety and confidentiality to prevent harm. The study aims to examine the existing indigenous pottery production processes in northern Ghana, focusing on cultural equality and diversity. Ethical principles, such as anonymity and participant protection, are integral to the research, safeguarding participants' morality, safety, and self-respect (Cunningham, 2023; Ephraim, 2024). In alignment with these considerations, several principles of research ethics were applied to ensure the protection and preservation of participants' anonymity and confidentiality throughout the study.

Human participants who consented to engage in this study were adequately informed about the study objectives, research methods, the type of data required, the anticipated use, and the harms and benefits of participating. Instead of writing, informed consent was obtained orally, a format that was agreed upon by the selected participants. The reason was that most of them (especially participants from Northern Ghanaian indigenous pottery centers) could not read or write. As an ethnographic study, participants were periodically reminded of the informed consent agreement, emphasizing their right to withdraw from participation at any time due to the long-term nature of the research process. Informed consent was approached as an ongoing negotiation throughout the progression of the study (Tilley, 2019; Garrels et al., 2022).

Ensuring participants' anonymity involved deliberately excluding names and any identifiable information throughout data collection, processing, storage, and reporting (Surmiak, 2018; Reyes, 2018). This approach aimed to protect individuals from potential cultural stigmatization or workplace repercussions that could arise from their involvement in the study. Therefore, the effective use of incognito measures preserved participants' anonymity in the research report by employing pseudonymization, which involved using fake names or coded identifiers instead of real names (DeGloma, 2023; Kangwa, 2023). Ethical considerations were meticulously evaluated to mitigate risks, ensuring that confidentiality and informed consent were upheld (Meyer, 2018; Bassey & Owan, 2019).

V. Results and Discussion

This study critically examines the existing indigenous pottery production process in Northern Ghana, offering a comprehensive account of traditional methods, cultural relevance, and evolving practices. Drawing on responses to key interview questions, the research investigates the entire production cycle, from the sourcing of raw materials to the final firing stage, while emphasizing the spiritual and communal dimensions embedded in the process. The study highlights the influence of rituals, taboos, and collective norms in clay extraction, reinforcing

the cultural depth of the craft. It further outlines each phase of production, including clay preparation, hand-forming techniques such as coil building, and careful drying methods to prevent flaws. Decorative practices, including burnishing, incising, and the use of symbolic motifs, are shown to not only enhance the aesthetic quality of the pottery but also reflect cultural identity and heritage. The communal nature of the craft plays a vital role in sustaining intergenerational knowledge and preserving artisanal traditions.

A key finding of the study is the increasing vulnerability of the production process, particularly concerning access to raw materials. Participants reported a shift from traditional, location-specific clay sourcing to more improvised methods, driven by land use changes such as urban expansion and agricultural development. As many established clay deposits become inaccessible, some communities have resorted to sourcing clay from construction sites, while others have engaged in legal advocacy to protect threatened clay sources. These developments reflect broader tensions between cultural preservation and modern development pressures. Although community efforts have had some success in safeguarding resources, the general trend indicates rising material scarcity and uncertainty. The study therefore calls for sustainable clay resource management and supportive policy interventions to ensure the viability of traditional pottery practices.

Rituals and Cultural Practices

In response to the question, “Are there any specific rituals or cultural practices associated with pottery making in this community?”, participants consistently highlighted the deep spiritual significance that underpins traditional pottery production in Northern Ghana, portraying it not merely as a technical endeavor but as an intrinsically sacred practice. Central to this belief system is the notion that clay is the property of the earth goddess, whose consent must be ritually obtained prior to extraction. This consent is sought through symbolic acts, such as speaking intentions into a raw egg and observing its reaction when thrown onto the clay site, if the egg breaks and is absorbed into the earth, it signifies approval, while an intact egg or hardened ground indicates spiritual restriction. In instances of rejection, collective sacrificial offerings involving goats, fowls, and additional eggs are performed to appease the goddess and restore access. These rituals underscore the communal responsibility in sustaining the craft and maintaining spiritual harmony. Furthermore, unexplained breakages during the firing stage are often interpreted as signs of spiritual displeasure, necessitating further ritual interventions. These findings affirm the interconnectedness of spiritual belief, communal practice, and material outcomes in pottery production, emphasizing the need for any educational or design innovations to align respectfully with local cultural frameworks.

Sourcing and Preparing Clay

Potters source clay from traditional locations recognized for their spiritual and material quality. However, participants reported increasing difficulty accessing these sites due to urbanization and land-use changes. Some communities have defended clay sources through legal action, ensuring their protection. The preparation process includes air-drying, crushing, soaking, and the addition of grog (ground pottery shards) to improve workability and minimize cracking.



Plate 1: Clay deposit preserved for indigenous potters in Kukuo by the Tamale High Court



Plate 2: Jakarayili community potter digging clay at preserved clay deposit



Plate 3: Kukuao community potter mixing grog with plastic clay



Plate 4: Jakarayili community potter mixing grog with plastic clay

Forming and Shaping Techniques

In response to the question, “*Can you describe the stages of creating a traditional pottery piece from start to finish?*”, participants provided comprehensive and insightful descriptions of the sequential stages involved in traditional pottery production, emphasizing the careful craftsmanship and cultural knowledge embedded in each step. The process typically begins with the preparation of clay and the formation of a flat slab that serves as the base of the vessel. Among the hand-building methods described, coil building emerged as the most commonly used technique. This involves shaping thick, short coils of clay and stacking them in a circular pattern to gradually build up the vessel's walls. The coils are then carefully blended to create a structurally sound form. The choice of technique is largely influenced by the intended function and shape of the final product, highlighting the utilitarian and aesthetic considerations of traditional artisans.

Following the initial construction, the vessel is allowed to dry slowly in a shaded area until it reaches the leather-hard stage, at this stage, artisans undertake various refinement activities to enhance the form and surface of the vessel. This includes trimming excess clay and smoothing the surface using a diverse range of locally sourced tools such as stones, wooden implements, seed pods (especially *kpalvugu*), leather strips, plastic materials, and even their bare hands. Decorative techniques, including incising and impressing, are applied at this stage, often using handmade stamps and traditional tools to create intricate patterns. Once all refinements and decorations are completed, the pottery is left to dry fully under shade to prevent cracking, before proceeding to the final firing stage.



Plate 5: Potter rolling out thick short coils of clay



Plate 6: Coils of clay systematically stacking in a circular pattern to build up the vessel's walls



Plate 7: Diverse range of locally sourced tools



Plate 8: Coils blended to create a unified structure



Plate 9: Trimming excess clay from pot



Plate 10: Smoothing the surfaces of pots at leather hard



Plate 11: Pottery wares going through drying process at room temperature

Decorative Methods

In the traditional pottery practices of Northern Ghana, decoration serves not merely as an aesthetic enhancement but as a vital expression of cultural identity and artistic heritage. Artisans employ a variety of decorative techniques including burnishing, incising, embossing, impressing, painting, and polishing to imbue their works with both beauty and symbolic meaning. Participants noted that burnishing, typically done with smooth stones, beads, or seeds, results in a glossy surface finish, while incising and impressing involve the use of tools such as combs, sticks, or fingers to create symbolic motifs like zigzags, spirals, and dots. These patterns often carry cultural significance, reflecting communal values, spiritual beliefs, and social identity. Participants also acknowledged the growing influence of innovation, with contemporary potters incorporating motifs inspired by natural elements and neighboring artistic traditions. These hybrid styles, which merge traditional and modern designs, are intended to preserve cultural continuity while appealing to evolving aesthetic preferences. Moreover, the use of locally sourced clay, characterized by distinctive earthy tones, further reinforces the regional identity and uniqueness of Northern Ghanaian pottery.



Plate 12: Embossed patterns



Plate 13: Incised and painted patterns

Firing Techniques and Cooling

Firing, a crucial phase in the pottery-making process, transforms fragile clay forms into durable pottery wares. Drawing on accounts from participants and supported by scholarly sources (Oesterritter, 2019; Eramo, 2020), it is evident that open-pit firing remains the predominant method in Northern Ghana, characterized by its accessibility and cultural embeddedness. This technique involves placing dried pots in a shallow pit and covering them with combustible materials such as firewood, millet stalks, grass, and cow dung. The pots are arranged in a

dome-like structure, with their mouths facing inward and stabilized using dry clay lumps to prevent collapse. The firing process is initiated from the base, and moisture is sometimes added to the fuel to control the burn rate and ensure even heat distribution. Participants described the process as a communal effort requiring careful monitoring to maintain consistent temperatures and prevent damage. Despite its limitations, such as uneven firing and risk of breakage, open-pit firing produces unique surface effects and color variations, ranging from smoky greys to reddish browns, which are highly valued for their aesthetic and cultural significance. This traditional method continues to be a cornerstone of indigenous ceramic practice, reinforcing both artistic individuality and community cohesion.



Plate 14: Positioning dry pottery wares for firing with bigger and heavier pots under and the mouths of the pots facing one another

The cooling phase in traditional pottery-making is a critical stage that significantly affects the structural integrity, durability, and aesthetic quality of the finished product. Iddrisu and Oliveira Lopes (2024) and Eramo (2020) highlight that gradual cooling after firing is essential to prevent thermal shock, which can lead to cracking or breakage. Sekonopo et al. (2023) and Carlton (2019) also note that traditional potters often employ slow, pit-based cooling methods to minimize internal stress, although some rapid cooling techniques are occasionally used to produce desired surface effects. Controlled cooling not only enhances the hardness and strength of ceramic ware but also ensures a higher resistance to mechanical stress. Once the pieces have cooled, they undergo careful inspection to assess both their structural soundness and visual appeal.

Insights gathered from participants affirm the cultural significance and technical precision of the cooling process. After firing, pots are left to cool gradually within embers, which prevents sudden temperature fluctuations and reduces the risk of damage. As explained by local artisans, once the pots are warm but no longer at peak heat, they are transferred to shaded areas to continue cooling under regulated conditions. This process safeguards the pottery's integrity while also allowing for aesthetic enhancements. Materials such as shea butter residue, millet husks, and cow dung are strategically introduced during cooling to generate dense smoke, producing a blackened, smoked finish on the clay surface. Additionally, the application of natural oils like shea butter enhances both visual sheen and practical qualities, such as water resistance and durability, thereby enriching the functional and decorative value of the pottery.



Plate 15: Pottery pieces are left to cool gradually within the embers



Plate 16: Pottery achieve a blackened, smoked finish

Product Variety and Functional Roles

The interviews revealed that indigenous pottery in Northern Ghana remains an essential and dynamic cultural tradition, deeply integrated into both practical and ceremonial life. Artisans continue to produce a diverse range of pottery types, each crafted for specific purposes rooted in daily routines, spiritual beliefs, and cultural customs. Participants provided detailed accounts of vessels such as *kodugu*, *lokorigu*, *zebahiga*, *lahi*, and *nosali*, among others, each fulfilling distinct roles. For instance, *kodugu* is used in funerary rites to boil water for bathing deceased bodies, while *lokorigu* and *zebahiga* are associated with fetching and storing water. Domestic applications include *lahi* for food serving and *kosurilaa* for bathing infants, whereas *moduhu* and *tikabridugu* serve medicinal and spiritual functions, such as boiling and burning herbs for healing rituals. These examples underscore how pottery is both a utilitarian craft and a medium for cultural expression and continuity.

Moreover, the findings highlight how pottery embodies social, spiritual, and symbolic meanings that reflect the broader cultural fabric of the region. The use of specific vessels during rites of passage, ancestral worship, and ceremonial events affirms pottery's role in preserving spiritual and communal practices. Gender roles are also central to the tradition, as women are typically the custodians of pottery-making skills, passing them down through generations and thus maintaining the craft's legacy. Participants emphasized that pottery can signify social status through variations in form, size, and decoration. Additionally, the communal aspects of pottery production, such as collective clay sourcing and firing, foster environmental stewardship and intergenerational solidarity. This holistic view of pottery reveals it not only as a material artifact but as a vessel of identity, memory, and cultural resilience within Northern Ghanaian society.



Plate 17: *Kodugu is used for boiling water for bathing deceased bodies*



Plate 18: *Lokorigu is used for fetching and transporting water*



Plate 19: *moduhu, used to boil herbs*



Plate 20: *tikabridugu used to burn herbs into charcoal*



Plate 21: *zebahigsi usually positioned in a compound for storage of drinking water*

Market Trends and Challenges

Participants noted declining youth interest in pottery due to perceived low income and labor intensity. The availability of mass-produced alternatives has also affected demand. While some potters have embraced new

designs, efforts to introduce innovation through formal training have had mixed results, often hindered by skepticism or lack of sustained support.

Cultural Relevance and Sustainability

Traditional pottery in Northern Ghana stands as a crucial embodiment of cultural heritage and artistic identity, yet it faces mounting threats from a combination of environmental, socio-cultural, and economic pressures. Isiekwe (2024) and Sutton (2020) underscore that the continued use of manual techniques, rudimentary tools, and open firing not only limits productivity but also results in high breakage rates and inconsistent product quality. Environmental challenges, including clay depletion, deforestation due to firewood use, and climate change impacts, further compromise the sustainability of the practice (Gray, 2023; Leal Filho et al., 2021). At the same time, shifting social dynamics, such as reduced youth interest, fragile systems of intergenerational knowledge transfer, and entrenched gender roles, have restricted the evolution of the craft (Williams, 2022; Sydora et al., 2023). The widespread availability of inexpensive, mass-produced alternatives has further eroded the market for traditional pottery, with poor infrastructure, seasonal demand fluctuations, and limited access to broader markets compounding these threats (Panikkaveetil et al., 2020; Ghose & Ali, 2023).

First-hand accounts from local potters reveal that urbanization and environmental degradation have disrupted traditional clay sourcing practices, leading to increased costs and production challenges. The rising price of firewood and lack of access to improved tools have intensified the physical and financial burdens on artisans. Pottery's role in society has shifted as functional demand declines, replaced largely by symbolic or decorative uses. This, coupled with perceptions of the craft as laborious and economically unviable, has discouraged younger generations from participating. Even those who acquire the necessary skills often leave the practice due to financial instability or personal transitions. The traditional apprenticeship model, once central to knowledge transmission, is increasingly insufficient in the face of modern socio-economic pressures (White & Adu-Ampong, 2024). Nevertheless, artisans remain committed to preserving traditional methods, viewing culturally aligned innovation as a potential path to revitalization. With growing interest in eco-friendly, handmade products among tourists and urban consumers, traditional pottery holds renewed relevance. These insights underscore the need for integrated policy and institutional support to enhance training, improve market access, and safeguard indigenous knowledge, ensuring the craft's long-term sustainability and cultural integrity.

VI. Conclusion and recommendation

This study critically examined traditional pottery practices in Northern Ghana, highlighting their ecological sustainability, cultural significance, and resilience in the face of modern challenges. The research revealed that indigenous pottery techniques, such as clay sourcing, coiling, pit firing, and natural decoration, are environmentally sustainable and culturally rich. These practices reflect generations of ecological adaptation and social cohesion within artisan communities.

Despite increasing pressure from industrial alternatives, environmental degradation, and youth disinterest, traditional pottery remains a viable and meaningful craft. Artisans continue to adapt by incorporating design innovation, recycling techniques, and cultural reinterpretation, all while preserving essential traditional knowledge. Their work offers valuable lessons in sustainability, especially as global attention shifts toward environmentally responsible production.

To preserve and enhance these traditions, the study recommends:

- Institutional support for artisan training, infrastructure, and market access.
- Cultural policy development that integrates traditional crafts into national heritage strategies.
- Educational partnerships to document and transmit indigenous knowledge.
- Eco-certification and fair-trade labeling to enhance product value and reach global markets.

Traditional pottery in Northern Ghana holds untapped potential not only as a cultural asset but also as a model for sustainable production. Future research should explore integration with modern ceramic education and interdisciplinary collaborations to scale innovation while safeguarding cultural authenticity.

References

- [1]. Alders, W.A., 2022. *Uneven ground: The archaeology of social transformation in Zanzibar, Tanzania*. University of California, Berkeley.
- [2]. Ankora, M.W.E., 2022. *Material Culture, African Textiles and National Identity* (Doctoral dissertation, University of Guelph).
- [3]. Bassey, BA & Owan, VJ (2019). *Ethical issues in educational research management and practice*. In PN Ololube & GU Nwiyi (Eds), *Encyclopedia of institutional leadership, policy, and management: A handbook of research in honour of Professor Ozo-Mekuri Ndimele*, pp.1287-1301.
- [4]. Bonsu, O., 2022. *African Art Now: 50 Pioneers defining African Art for the Twenty-first century*. Chronicle Books.
- [5]. Bundrick, S.D., 2019. *Athens, Etruria, and the many lives of Greek figured pottery*. University of Wisconsin Press.
- [6]. Burrows, L.E., 2019. *"A Spiritual Heritage": Change and Continuity in Ancestrally Based Authority Over Land in Northern Ghana* (Doctoral dissertation, Appalachian State University).

- [7]. Carlton, R., 2019. Tempering expectations: What do West Balkan potters think they are doing. *Tracing Pottery Making Recipes in the Balkans 6th-4th Millennium BC*. Oxford, Archaeopress, pp.8-24.
- [8]. Cash, P., Isaksson, O., Maier, A. and Summers, J., 2022. Sampling in design research: Eight key considerations. *Design studies*, 78, p.101077.
- [9]. Costa, R., 2019. Iphone, iResearch. Exploring the use of smart phones in the teaching and learning of visual qualitative methodologies: innovative teaching idea. *Journal of Visual Literacy*, 38(1-2), pp.153-162.
- [10]. Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- [11]. Cunningham, P., 2023. Fast Growth Private Firms: The Power of Ethical Values and Trust in Enhancing Performance. In *Encyclopedia of Business and Professional Ethics* (pp. 881-886). Cham: Springer International Publishing.
- [12]. D'Ercole, G., 2021. Seventy years of pottery studies in the archaeology of Mesolithic and Neolithic Sudan. *African Archaeological Review*, 38(2), pp.345-372.
- [13]. David, R. and Salvatori, S., 2019. Ceramic production in The Middle Nile Valley, Sudan (8000 BC-1500 AD). *Encyclopedia of global archaeology*. Springer. https://doi.org/10.1007/978-3-319-51726-1_3350-1.
- [14]. DeGloma, T., 2023. *Anonymous: The performance of hidden identities*. University of Chicago Press.
- [15]. Derenne, E., Ard, V., & Besse, M. (2020). Pottery technology as a revealer of cultural and symbolic shifts: Funerary and ritual practices in the Sion 'Petit-Chasseur' megalithic necropolis (3100–1600 BC, Western Switzerland). *Journal of Anthropological Archaeology*, 58. <https://doi.org/10.1016/j.jaa.2020.101170>
- [16]. Dzamedo, B.E., Kuuder, C.J.W. and Amoah, P., 2023. Rural Tourism Promotion and livelihood enhancement: an evaluation of craftworks of Sirigu Women Organisation in Pottery and Arts (SWOPA) Project in the Kasena-Nankana East District of Ghana. *Journal of Innovations in Art and Culture for Nature Conservation and Environmental Sustainability*, 1(2).
- [17]. Ehret, C., 2023. *Ancient Africa: A Global History, to 300 CE*. Princeton University Press.
- [18]. Ephraim, A., 2024. A descriptive qualitative study exploring youth with intellectual disabilities participation in the community of Moshi.
- [19]. Eramo, G., 2020. Ceramic technology: how to recognize clay processing. *Archaeological and Anthropological Sciences*, 12(8), p.164.
- [20]. Fan, K.K. and Feng, T.T., 2019. Discussion on sustainable development strategies of the traditional handicraft industry based on su-style furniture in the ming dynasty. *Sustainability*, 11(7), p.2008.
- [21]. Fishman, S.G., 2017. *Ceramic Entanglements in the Urartian Periphery: Technology as the Nexus of Politics and Practice*. University of Pennsylvania.
- [22]. Fredriksen, P.D., 2023. Ceramics and Archaeology in Southern Africa. In *Oxford Research Encyclopedia of African History*.
- [23]. Fredriksen, P.D., 2023. Ceramics and Archaeology in Southern Africa. In *Oxford Research Encyclopedia of African History*.
- [24]. Garrels, V., Skåland, B. and Schmid, E., 2022. Blurring boundaries: Balancing between distance and proximity in qualitative research studies with vulnerable participants. *International Journal of Qualitative Methods*, 21, p.16094069221095655.
- [25]. Ghose, A. and Aamir Ali, S.M., 2023. Protection and Preservation of Traditional Cultural Expressions & Traditional Knowledge in Handicraft Industry: Advocating the Need for a Global Cultural Policy Framework. *Revista de Direito Internacional*, 20(2).
- [26]. Ghose, A. and Ali, S.M., 2023. Protection and Preservation of Traditional Cultural Expression & Traditional Knowledge in Handicraft Industry: Advocating the Need for a Global Cultural Policy Framework. *Braz. J. Int'l L.*, 20, p.473.
- [27]. Ghose, A. and Ali, S.M., 2023. Protection and Preservation of Traditional Cultural Expression & Traditional Knowledge in Handicraft Industry: Advocating the Need for a Global Cultural Policy Framework. *Braz. J. Int'l L.*, 20, p.473.
- [28]. Gray, S., 2023. *In the shadow of the seawall: Coastal injustice and the dilemma of placekeeping*. Univ of California Press.
- [29]. Greenberg, R., 2019. *The Archaeology of the Bronze Age Levant*. Cambridge University Press.
- [30]. Harvey, G., 2021. Field Research and participant observation. In *The Routledge handbook of research methods in the study of religion* (pp. 273-299). Routledge.
- [31]. Hilditch, J., Jeffra, C. and Opgenhaffen, L., 2021. The Tracing the Potter's Wheel Project (TPW): An Integrated Archaeological Investigation of the Potter's Wheel in the Bronze Age Aegean. *Interdisciplinaria Archaeologica*, 12(2), pp.345-355.
- [32]. Iddrisu, Y. and Oliveira Lopes, R., 2024. Towards the enhancement of folk pottery through design innovation: a narrative review. *Creative Industries Journal*, pp.1-25.
- [33]. Iddrisu, Y., & Oliveira Lopes, R. (2024). Towards the enhancement of folk pottery through design innovation: a narrative review. In *Creative Industries Journal*. Routledge.
- [34]. Isiekwe, O., 2024. Creating Relevance for Small and Medium-Scale Potters Within Industry 5.0.
- [35]. Jones, R., 2021. The decoration and firing of ancient Greek pottery: a review of recent investigations. *Advances in Archaeomaterials*, 2(2), pp.67-127.
- [36]. Kangwa, M., 2023. *Prevention of personally identifiable information leakage in ecommerce using offline data minimization and online pseudonymisation* (Doctoral dissertation, The University of Zambia).
- [37]. Khoa, B.T., Hung, B.P. and Hejsalem-Brahmi, M., 2023. Qualitative research in social sciences: data collection, data analysis and report writing. *International Journal of Public Sector Performance Management*, 12(1-2), pp.187-209.
- [38]. Leal Filho, W., Azeiteiro, U.M., Balogun, A.L., Setti, A.F.F., Mucova, S.A., Ayal, D., Totin, E., Lydia, A.M., Kalaba, F.K. and Oguge, N.O., 2021. The influence of ecosystems services depletion to climate change adaptation efforts in Africa. *Science of the Total Environment*, 779, p.146414.
- [39]. Levitt, H.M., 2021. Qualitative generalization, not to the population but to the phenomenon: Reconceptualizing variation in qualitative research. *Qualitative Psychology*, 8(1), p.95.
- [40]. Liard, F., Sanders, G., Amara, A.B. and Mueller, N., 2022. Lead-glazed pottery at Late Medieval Corinth: assessing craft production and trade at a Greek city under western influence. *Hesperia: The Journal of the American School of Classical Studies at Athens*, 91(3), pp.485-569.
- [41]. Love, A.R. and Randolph, D., 2024. *An introductory guide to qualitative research in art museums*. Taylor & Francis.
- [42]. Maritan, L., Gravagna, E., Cavazzini, G., Zerboni, A., Mazzoli, C., Grifa, C., Mercurio, M., Mohamed, A.A., Usai, D. and Salvatori, S., 2023. Nile River clayey materials in Sudan: Chemical and isotope analysis as reference data for ancient pottery provenance studies. *Quaternary International*, 657, pp.50-66.
- [43]. McKenzie, H., 2018. Clay stories. *Ceramics Art and Perception*, (108), pp.74-79.
- [44]. Meyer, M.N., 2018. Practical tips for ethical data sharing. *Advances in methods and practices in psychological science*, 1(1), pp.131-144.
- [45]. Minh, N.T.T., 2025. Exploring qualitative data collection methods for dissertation research. In *Qualitative research methods for dissertation research* (pp. 81-124). IGI Global Scientific Publishing.

- [46]. Möller, H. and Rieger, A.K., 2019. Necessity is the mother of invention: the fuel of Graeco-Roman pottery kilns in the semi-arid Eastern Marmarica. McDonald Institute for Archaeological Research.
- [47]. Momade, Y.M.T., 2022. *The influence of culture on interior design-Morocco: from case studies and expert interviews* (Doctoral dissertation).
- [48]. Nelson, M.K. and Shilling, D. eds., 2018. *Traditional ecological knowledge: Learning from Indigenous practices for environmental sustainability*. Cambridge University Press.
- [49]. Nortey, S., & Asiamoaso, E. (2019). The Effect of the Decline on Pottery in Ghana and Socio-Economic Implications on Potters. *Ghana Journal of Science*, 60(2), 42–54. <https://doi.org/10.4314/gjs.v60i2.5>
- [50]. Nortey, S., Amoanyi, R., & Essuman, A. (2018). The determinants of pottery demand in Ghana. *Journal of Science and Technology (Ghana)*, 37(1), 75–84. <https://doi.org/10.4314/just.v37i1.7>
- [51]. Norton, M.G., 2021. Clay—The Material of Life. In *Ten Materials That Shaped Our World* (pp. 25-44). Cham: Springer International Publishing.
- [52]. Nti, K., 2024. *Maritime Culture and Everyday Life in Nineteenth-and Twentieth-Century Coastal Ghana: A Social History of Cape Coast*. Indiana University Press.
- [53]. Nwosimiri, O., 2021. African Cultural Values, Practices and Modern Technology. In *African Values, Ethics, and Technology: Questions, Issues, and Approaches* (pp. 89-102). Cham: Springer International Publishing.
- [54]. Nyarko, M.O., Asare, T.O., Crentsil, T., Ayesu, S.M. and Fobiri, G.K., 2023. Visual Arts as Critical Tool for Indigenous Orthopedic Therapy among the Akans of Ghana. *International Journal of Innovation and Development*, 1(1).
- [55]. Oesteritter, L., 2019. *Mastering Kilns and Firing: Raku, Pit and Barrel, Wood Firing, and More*. Quarry Books.
- [56]. Osborne, L.G., 2023. *Constrained to Create: The Regenerative Dance Between Designer Creativity, Sustainability, and Design*. Drexel University.
- [57]. Panikkaveetil, A., Jishnu, K. and Harikumar, S., 2020. Impact of globalization and tourism on production of pottery and other handicrafts in the Global South. *International Journal of Tourism and Hotel Management*, 2(2), pp.26-32.
- [58]. Patch, D.C. and LaGamma, A., 2022. *The African Origin of Civilization*. Metropolitan Museum of Art.
- [59]. Patch, D.C. and LaGamma, A., 2022. *The African Origin of Civilization*. Metropolitan Museum of Art.
- [60]. Probst, P., 2022. *What is African Art?: A Short History*. University of Chicago Press.
- [61]. Ren, J., 2019. Islamic Ceramics, Indelible Creations: Assessing and Preserving the Scripps Collection.
- [62]. Reyes, V., 2018. Three models of transparency in ethnographic research: Naming places, naming people, and sharing data. *Ethnography*, 19(2), pp.204-226.
- [63]. Roulston, K., 2021. *Interviewing: A guide to theory and practice*. Sage Publications.
- [64]. Roux, V., 2019. *Ceramics and society: a technological approach to archaeological assemblages*. Springer.
- [65]. Saboro, E., 2022. Remembering a Fractured Past: Historicizing Violence, Captivity, and Enslavement in Northern Ghana in the Nineteenth Century. In *Wounds of Our Past* (pp. 25-53). Brill.
- [66]. Saboro, E., 2022. Wounds of our past: Remembering captivity, enslavement and resistance in african oral narratives. In *Wounds of Our Past*. Brill.
- [67]. Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson.
- [68]. Seidu, R.K., Howard, E.K., Apau, E. and Eghan, B., 2022. Symbolism and conservation of indigenous African textiles for museums. *Handbook of Museum Textiles*, 1, pp.239-265.
- [69]. Sekonopo, P., Motshubi, S., Letsatsi, M. and Adelabu, S.O., 2023. Traditional Manufacturing. In *African Industrial Design Practice* (pp. 190-216). Routledge.
- [70]. Sekonopo, P., Motshubi, S., Letsatsi, M. and Adelabu, S.O., 2023. Traditional Manufacturing. In *African Industrial Design Practice* (pp. 190-216). Routledge.
- [71]. Shakarov, A., 2019. *Encyclopedia: Art of Africa Volume 1*. Austin Macauley Publishers.
- [72]. Speight, C., 2019. *Looking, Understanding and Making Meaning: Higher Education Ceramics Students as a'community of Learners'* (Doctoral dissertation, University of Brighton).
- [73]. Stuart, E.A., Ackerman, B. and Westreich, D., 2018. Generalizability of randomized trial results to target populations: design and analysis possibilities. *Research on social work practice*, 28(5), pp.532-537.
- [74]. Surmiak, A.D., 2018. Confidentiality in qualitative research involving vulnerable participants: Researchers' perspectives. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 19, No. 3). DEU.
- [75]. Sutton, A., 2020. Revolutions: the introduction of the potter's wheel to southern Britain, and its implications for understanding Late Iron Age societies. *Archaeological Journal*, 177(2), pp.214-255.
- [76]. Sydora, B.C., Listener, L., Kung, J.Y., Ross, S. and Voyageur, C., 2023. Traditional crafting as a catalyst for Indigenous women's intergenerational cohesion and wellness: A Canadian perspective. *International Journal of Circumpolar Health*, 82(1), p.2175763.
- [77]. Tilley, S., 2019. *Doing respectful research: Power, privilege and passion*. Fernwood Publishing.
- [78]. Tin, N.T. and Bui, H.P., 2024. Sampling, generalizability, and reliability. In *Applied linguistics and language education research methods: Fundamentals and innovations* (pp. 103-121). IGI Global Scientific Publishing.
- [79]. Tracy, S.J., 2019. *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*. John Wiley & Sons.
- [80]. Tracy, S.J., 2024. *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*. John Wiley & Sons.
- [81]. White, E. and Adu-Ampong, E.A., 2024. In the potter's hand: tourism and the everyday practices of authentic intangible cultural heritage in a pottery village. *Journal of Heritage Tourism*, 19(6), pp.781-800.
- [82]. White, E. and Adu-Ampong, E.A., 2024. In the potter's hand: tourism and the everyday practices of authentic intangible cultural heritage in a pottery village. *Journal of Heritage Tourism*, 19(6), pp.781-800.
- [83]. Willcox, A.R., 2018. *The rock art of Africa*. Routledge.
- [84]. Williams, A., 2022. *Intergenerational Friendships: A Qualitative Study of Senior Citizens Experiences with Young People* (Doctoral dissertation, Capella University).
- [85]. Yussif, I., Kafui, A., & Vesta, E. A. G. (2018, May 21). *Some Functions and Contexts of Traditional Pottery in Northern Ghana*. Asian Research Journal of Arts & Social Sciences. <https://doi.org/DOI: 10.9734/ARJASS/2018/41150>