CRAEFT

Policy Recommendations

Project Acronym	Craeft
Project Title	Craft Understanding, Education, Training, and Preservation for Posterity and Prosperity
Project Number	101094349
Deliverable Number	D8.2
Deliverable Title	Policy Recommendations
Work Package	WP8
Authors	Xenophon Zabulis, Nikolaos Partarakis, Carlo Meghini, Valentina Bartalesi, Christian Holz, Matias Katajavaara Seidler, Laura Werup, Sotiris Manitsaris, Arnaud Dubois, Christodoulos Ringas, Aikaterini Ziova, Danai Kaplanidi, David Arnaud, Patricia Hee, Juan José Ortega, Marie-Adelaide Benvenuti, and Jelena Krivokapic
Number of pages	82

Executive summary

This deliverable articulates the findings, measures for future action, and policy recommendations developed by the Craeft – Craft Understanding, Education, Training & Preservation for Posterity and Prosperity project in the context of European efforts to sustain and revitalise traditional crafts as a cultural, social, and economic asset. Traditional crafts are deeply embedded in Europe's cultural identity and local economies. They carry tacit knowledge accumulated over generations, express regional distinctiveness, and contribute to social cohesion. Yet, the craft sector increasingly contends with marginalisation, a shrinking skilled workforce, fragmented education and training provision, and limited integration within broader innovation and sustainability policies.

The core of this deliverable is grounded in an integrated methodology that combines qualitative fieldwork, multidisciplinary analysis, and comparative case study research across multiple craft domains (including textiles, ceramics, glass, wood, and stone). Through systematic inquiry into production practices, educational pathways, technological opportunities, and structural constraints, the project generated insights into the craft sector's enduring values and pressing bottlenecks. These insights informed a framework of measures and recommendations intended to influence policy design at local, national, and European scales.

The analysis reveals that sustainable renewal of crafts is possible when digital technologies, education and training systems, and supportive policy frameworks intersect coherently. Digital tools are not ends in themselves; their value lies in strengthening apprenticeships, enabling scalable documentation of tacit techniques, and expanding market reach without compromising authenticity. Education systems must evolve to support flexible, hybrid learning that bridges formal vocational pathways with informal and practice-based learning, enhancing access and recognition for craft practitioners. Policy instruments must address fragmentation by integrating craft concerns across cultural heritage, innovation, skills, and sustainability agendas, and by aligning support mechanisms with European instruments such as Creative Europe, Erasmus+, and cohesion policy.

This deliverable situates its recommendations within the broader European initiative CRAFTOUR. This collaborative cluster unites six projects funded under Horizon Europe and Erasmus+ to coordinate evidence, best practices, and joint policy dialogue on traditional crafts. CRAFTOUR's mission is to promote innovative and sustainable practices for craftsmanship, strengthen skill transmission, protect authenticity, and support viable business models across the EU – efforts that mirror and reinforce the analytical conclusions and policy directions presented here. The alignment with CRAFTOUR amplifies the reach of these recommendations and embeds them within a broader European policy conversation on the socio-economic role of crafts and their sustainability.

The deliverable concludes with a set of outcomes that describe pathways for future action and strategic policy recommendations. These outcomes are presented as a continuum of short- and long-term measures that seek to transform the structural environment for traditional crafts while preserving their cultural integrity and material specificity. By doing so, the deliverable positions crafts not as heritage relics but as dynamic contributors to cultural innovation, resilient livelihoods, and sustainable regional development.

Deliverable Structure

The structure of the deliverables reflects a methodological progression from inquiry to impact formulation. Sections 1 to 4 constitute a systematic methodological foundation. The introduction establishes the problem space and justifies the research focus on intersecting pressures facing traditional crafts. The subsequent background review situates the work within existing cultural policy, educational frameworks, and heritage research. A clearly defined mixed-method research design then underpins the subsequent analysis of empirical evidence. The findings synthesise insights from multiple craft field studies and identify recurrent structural patterns and leverage points for intervention. This evidentiary base ensures that the policy recommendations are grounded in empirical observation and cross-case comparative reasoning.

Sections 5 and 6 translate the analytical evidence into actionable measures and strategic policy recommendations. This shift marks a transition from understanding and diagnosis to formulation of future-oriented proposals that are sensitive to current constraints and aligned with broader European policy frameworks. The recommended measures span craft-level innovation, education and training initiatives, and policy reform strategies, providing a coherent strategy for sustained impact at multiple governance scales.

Section 1 situates traditional crafts within contemporary European challenges and frames the need for integrated inquiry. It outlines the core themes of heritage preservation, education, digital augmentation, and policy engagement and sets the research agenda for the study.

Section 2 reviews existing scholarship and policy landscapes, drawing on cultural policy analysis, heritage studies, educational frameworks, and sustainability discourse. This contextual overview underscores the multidimensional value of crafts and highlights gaps in current support mechanisms.

Section 3 explains the research logic, detailing how fieldwork, interviews with practitioners, contextual economic data, and qualitative comparative analysis were combined to generate robust insights. It justifies the selection of case studies and describes analytical procedures.

Section 4 synthesises the empirical evidence. It identifies shared challenges across craft domains – including workforce ageing, transmission barriers, digital exclusion, and policy fragmentation – and analyses how these factors interact with opportunities for innovation, sustainability practices, and economic diversification.

Section 5 translates analytical observations into a narrative of actionable measures. It focuses on strengthening craft businesses through sustainable models, modernising curricula and training pathways, preserving tacit skills through hybrid and digital methods, and fostering networks for knowledge exchange.

Section 6 articulates strategic proposals for policy frameworks that integrate craft concerns into European cultural and innovation agendas. It frames recommendations within the context of existing instruments and discusses pathways for institutional adoption and scaling.

Section 7 reflects on the theoretical and practical implications of the study, reaffirms the significance of its recommendations, and considers future research trajectories and stakeholder engagement.

Section 8 addresses issues of authenticity, cultural integrity, responsible documentation, and the ethical implications of digital augmentation of craft knowledge, ensuring that proposed measures remain sensitive to community values and heritage contexts.

Document history

Date	Author	Affiliation	Comment
2/2/2024	Xenophon Zabulis	FORTH	First Version
21/2/2024	Xenophon Zabulis	FORTH	Revision after discussion with the consortium
09/1/2025 - 12/2/2025	Xenophon Zabulis, Nikolaos Partarakis, Carlo Meghini, Valentina Bartalesi, Christian Holz, Matias Katajavaara Seidler, Laura Werup, Sotiris Manitsaris, Arnaud Dubois, Christodoulos Ringas, Aikaterini Ziova, Danai Kaplanidi, David Arnaud, Patricia Hee, Juan José Ortega, Marie-Adelaide Benvenuti, and Jelena Krivokapic	All partners	Contributions to the second version
14/2/2025	Karamaounas Polukarpos	FORTH	QAM review
20/2/2025	Xenophon Zabulis	FORTH	Second version
20/2/2026	Xenophon Zabulis, Nikolaos Partarakis, Carlo Meghini, Valentina Bartalesi, Christian Holz, Matias Katajavaara Seidler, Laura Werup, Sotiris Manitsaris, Arnaud Dubois, Christodoulos Ringas, Aikaterini Ziova, Danai Kaplanidi, David Arnaud, Patricia Hee, Juan José Ortega, Marie-Adelaide Benvenuti, and Jelena Krivokapic	All partners	Contributions to the third version
23/2/2026	Karamaounas Polukarpos	FORTH	QAM review
25/2/2026	Xenophon Zabulis	FORTH	Third version
26/2/2026	Xenophon Zabulis	FORTH	Formatting

Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
CAP	Common Agricultural Policy
CCS	Cultural and Creative Sectors
CCI	Cultural and Creative Industries
CH	Cultural Heritage
CHI	Cultural Heritage Institution
CNC	Computer Numerical Control
ECHY	European Cultural Heritage Year
ERDF	European Regional Development Fund
ESF+	European Social Fund Plus
EU	European Union
GDP	Gross Domestic Product
HEI	Higher Education Institution
ICT	Information and Communication Technologies
IP	Intellectual Property
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
LLP	Lifelong Learning Programme
NGO	Non-Governmental Organization
PGI	Protected Geographical Indication
QA	Quality Assurance
R&I	Research and Innovation
RRF	Recovery and Resilience Facility
SDGs	Sustainable Development Goals
SMEs	Small and Medium-sized Enterprises
TCs	Traditional Crafts
TSG	Traditional Speciality Guaranteed
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	Vocational Education and Training
VR	Virtual Reality

Table of contents

1. Introduction

Traditional crafts (TCs) represent a very valuable collection of Cultural Heritage (CH), embodying skills, knowledge, and creativity passed on between generations. These crafts, emanating from local traditions and fine-tuned over many centuries, are therefore irreplaceable in their cultural, social, and economic value [1]. In Europe, they mark the identity of communities, important in their local economies, but also today, unique tourism attractions [2-4]. However, in a time of rapid technological changes, shifting consumer behaviours, and pressure from the globalisation of the economy, TCs are facing significant challenges.

However, the changing landscape of consumer preferences, globalisation, and rapid technological advances poses significant challenges to TCs. Artisans face the erosion of traditional knowledge, economic pressures from mass production, and dwindling interest in craft professions [5-7]. Despite these challenges, TCs keep their high relevance for modern society, with their practice offering opportunities to address issues on sustainability, education, and cultural diversity, which are of global concern. In particular, the incorporation of digital technology such as **3D scanning, photogrammetry, VR, and AR** in the crafts brings new opportunities for the preservation of knowledge, techniques, and artefacts of craft, innovation through education and training, and the spread of knowledge to the scientific community and society as a whole.8, 9]. 3D scanning, photogrammetry, and Augmented Reality (AR) enable the use of new dimensions in the representation, preservation, and sharing of traditional craft techniques and artefacts [10, 11]. These technologies ensure that traditional practices, which may otherwise be at risk of extinction, are digitally captured and made accessible to wider audiences, ensuring their long-term sustainability and accessibility. Moreover, Virtual Reality (VR) and digital reenactment allow for the recreation of craft processes, enabling immersive experiences that can increase interest in and understanding of these heritage skills. Following **Rogers' Innovation Diffusion Model [12]**, the adoption of these tools is not uniform; some artisans may act as early adopters, while others face barriers, such as a lack of technical skills or resource limitations. Understanding this diffusion curve is critical for targeted interventions.

Digital technologies go beyond preservation by contributing to education and training. E-learning platforms, virtual apprenticeships, and gamified environments have the potential to change the way craft knowledge is transmitted. These innovations can support the engagement of new generations by offering interactive, flexible learning experiences that adapt to contemporary preferences [13, 14]. Thus, they will be able to support ubiquitous learning, bridging or reducing the geographical distances between the knowledge of the craft and the apprentice or student. By doing so, digital technologies act as powerful enablers of the transmission and evolution of TCs. At the same time, such innovations empower practitioners to continue practising their craft in their homeland. Maintaining traditional practices fosters a strong sense of identity and regional resilience, as outlined by the **place attachment theory [15]**. Furthermore, these technological innovations align with **Florida's Creative Economy Framework**, as they position TCs as drivers of local innovation clusters and attract cultural tourism, reinforcing the creative potential of regions [16].

Sustainability remains a vital concern, given the environmental and ethical challenges associated with traditional craft practices. The adoption of **sustainability frameworks**, such as the **Triple Bottom Line [17]** and alignment with **UN SDGs [18I** is essential to balance cultural preservation with environmental and

social responsibilities. Digital technologies can further support sustainable practices by minimising resource waste and facilitating eco-conscious design approaches.

In this work, these critical intersections of tradition, technology, and policy are explored, and a forward-looking framework of policy recommendations is proffered to assure the evolution and prosperity of TCs and their communities in the 21st century. The work elaborates on a holistic approach in which grassroots innovation interplays with strong policy support in satisfying the needs of the artisan, educator, and policymaker. In the next sections, we will go into detail on these dimensions, starting with a presentation of the background and related work regarding TCs.

1.1 Motivation

In Europe, TCs act not only as an indicator of cultural identity but also as an important part of economic activities at the local levels, tourism, and innovative industries. However, the pressure of globalisation, industrialisation, and digitisation increasingly stands in the way of efforts toward their preservation and further relevance [19]. These are complemented by sustainability and valorisation, strategies that have been taken up to adapt TCs to contemporary societal and environmental demands while guaranteeing their survival. Education and policy will undoubtedly go a long way in fostering innovation, transmitting knowledge to future generations, and securing the relevance of these practices into the future. Yet it is digital technology that is rapidly becoming a powerful enabler of this process. Digital tools like 3D scanning, photogrammetry, and AR offer unparalleled possibilities for the representation, presentation, and preservation of crafts [20, 21]. This technology allows for the detailed capturing of artefacts and craft processes to ensure their longevity and usability for future generations [22, 23]. Even more so, VR and AR enhance it by providing immersive platforms on which to demonstrate and explore traditional techniques. This might also be done through digital reenactment in cases that would otherwise be lost due to the passage of time.

The motivation of this research work goes beyond the preservation of digital technologies and sustainability that hold potential for education and training in TCs. By bridging geographical divides, offering access to craft knowledge and training on a global scale, and supporting new entrepreneurship via policy making, TCs can endure in a changing world with benefits for all of us.

1.2 Objectives of the Study

Based on the aforementioned motivation, the objective of this study is to bridge the gap between the historical significance of TCs and their enabling role toward a sustainable future, with a particular emphasis on integrating digital technologies, innovative education methods, and supportive policy frameworks to support their long-term sustainability.

At the level of craft technology and education, the research investigates the challenges of declining traditional knowledge, economic pressure, and a lack of access to global markets for artisans. It examines how digital technologies, such as 3D scanning, AR, and digital reenactment, can support the representation, presentation, and preservation of craft practices and artefacts. Additionally, it calls for a reimagining of approaches to education and training using immersive technologies, e-learning platforms, and interactive tools, which can better engage learners and help ensure the intergenerational transmission of craft skills. Furthermore, the research explores the potential for collaborations between

artisans, educators, and technologists to develop innovative solutions that sustain both the cultural and economic viability of TCs in today's world.

On the policy level, this study will look at how European and national frameworks provide support to traditional craft through funding mechanisms, legislation, and recognition programs. It develops proposals on policy strategies that can be pursued to foster investment in sustainable practices, digital infrastructure, and cultural innovation. This includes advocating for the integration of TCs into broader sustainability and CH agendas, ensuring alignment with initiatives such as the European Green Deal [24] and UNESCO's heritage protection guidelines [25]. In addition, the research underlines that policy measures should provide incentives for artisans to adopt digital tools, such as subsidies, training programs, and knowledge-sharing platforms. Recognising that European heritage is interconnected, it also calls for cross-border collaboration and policy harmonisation to enhance the mobility of artisans and facilitate the cross-border exchange of best practices. This study offers a multi-level roadmap from the grassroots to the policy level to ensure the future relevance and resilience of TCs.

1.3 Education and training

Education and training play a central role in this transformation. Traditional master–apprentice models remain fundamental but are increasingly challenged by contemporary labour markets, educational structures, and social expectations. Digital learning environments, blended training models, and immersive tools offer complementary pathways that can extend and reinforce hands-on learning. Integrating digital competences into craft education can help attract younger generations, support intergenerational knowledge transfer, and prepare artisans for contemporary economic and technological contexts.

1.4 The importance of Policy Frameworks

Policy frameworks at European, national, and regional levels are therefore critical for enabling the sustainable development of traditional crafts. Cultural, educational, innovation, and sustainability policies must be better aligned to support digital integration, cross-border collaboration, skills development, and fair market conditions for artisans. In parallel, the growing emphasis on sustainability offers an opportunity to position traditional crafts as contributors to broader European environmental and social objectives.

Building on these premises, this policy brief draws on the outcomes of Craeft to propose a holistic and evidence-informed approach to the future of traditional crafts in Europe. By connecting technological innovation, education and training, and coordinated policy action, it provides a structured set of recommendations aimed at policymakers, cultural institutions, education providers, and craft communities. The objective is to support the long-term relevance, resilience, and societal contribution of traditional crafts within an evolving European policy landscape.

2 Background and Related Work

TCs represent a rich and diverse part of CH, often embedded with local knowledge, values, and artistic expression [26]. However, over the past several decades, traditional craft practices have faced increasing challenges due to rapid technological advancements, industrialisation, and globalisation [27]. These factors have resulted in a decline in the number of skilled artisans, the loss of traditional knowledge, and reduced economic viability for craft-based industries on TCs, which has therefore become a central concern for CH experts, educators, and policymakers.28-30]. In the context of cultural sustainability, TCs are recognised for their potential to contribute to local economies, tourism, and social cohesion [31-36]. However, the sustainability of these practices requires innovative approaches that can integrate modern technologies with traditional methods, ensuring that crafts remain relevant and accessible in today's rapidly changing world [37-40].

Digital technology is one of the most promising tools for addressing these challenges [41-44]. Technologies such as 3D scanning [45-47], photogrammetry [48-50], AR [51-53], and digital re-enactment [54-57] allow for the digital preservation of craft processes, artefacts, and techniques, which might otherwise be lost. For instance, 3D scanning has been widely used to capture the details of cultural artefacts, enabling their preservation in digital archives and facilitating virtual access for researchers and the public [58-61]. Furthermore, AR has been used to support interaction with digital models of TCs and better understand their creation [62-63].

In terms of education and training, digital technology brings new possibilities for teaching and learning traditional craft skills [64-68]. Online platforms, virtual apprenticeships, and interactive tools enable a broader and more global reach for craft education, overcoming geographical and logistical barriers [69-72]. Research has demonstrated that e-learning environments, particularly those incorporating gamification and interactive components, are effective in engaging younger generations and fostering active participation in craft learning [73-75]. These technologies are not only facilitating the transmission, but also providing a platform for innovation, allowing artisans to experiment with new designs and techniques that combine TCs with modern digital tools [76-78].

The role of policy is also fundamental in supporting the intersection of digital services and TCs. Governments and cultural organisations have begun to recognise the potential of digital technologies for heritage preservation, and several initiatives have been launched to support this integration [79-82]. For example, the European Union has provided recommendations on the digitisation and online accessibility of cultural material and digital preservation [83]. The European Year of CH recognised CH as a broad spectrum of resources inherited in all forms and aspects: tangible, intangible, and digital - both 'born digital' or digitised [84]. Key objectives were to promote solutions that make CH accessible to all, including via digital means, support the development of specialised skills to improve knowledge management and knowledge transfer to the CH sector, and promote research and innovation concerning CH. Furthermore, since 2014, Creative Europe has been supporting projects to foster cultural diversity, promote artistic expression, and boost the economic potential of the creative industries [85].

However, despite these efforts, challenges remain, particularly in terms of infrastructure and financial support needed to ensure the long-term sustainability of digital preservation practices. Policies that provide incentives for artisans to adopt digital tools, alongside funding for education and infrastructure, are key to fostering the integration of TCs and modern technology.

2.1 Sociological Perspectives and Social Sciences Contribution

The study of craft transformations in the context of the "digital age" requires an in-depth sociological approach to understand the social dynamics underlying these coevolutionary relationships. Research into the sociology of technology has highlighted the complexity of processes of adoption and adaptation to technological innovations in traditional craft communities. For example, the adoption of the Jacquard loom in 19th-century Lyon provides an early example of how pre-existing professional hierarchies influenced technology adoption. The loom, an early programmable device, faced resistance from skilled weavers who feared it would devalue their craftsmanship. However, over time, it was embraced by workshops that balanced artisanal expertise with increased productivity. This dynamic shows how the balance between tradition and technological efficiency shaped adoption. Sociological perspectives underline the importance of pre-existing social relations, established professional hierarchies, and value systems in the acceptance or resistance to technological change. The use of the Societal Readiness Level (SRL) [86] scale could prove particularly relevant in this context, offering a structured methodological framework for assessing the societal maturity of proposed innovations in the craft sector. This approach makes it possible not only to measure the social acceptability of technological solutions but also to anticipate their impact on social structures, modes of knowledge transmission, and the professional identities of craftspeople.

The introduction of digital technologies is profoundly altering traditional master-apprentice-material relationships [87], creating new forms of creative and aesthetic interaction, as well as different power relationships within workshops. These changes are accompanied by a redefinition of social roles and professional identities, with mastery of digital tools gradually becoming a marker of status and competence, in addition to traditional know-how. Research fields and experiments also highlight the emergence of new forms of professional sociability, notably through digital platforms and specialised social networks, which complement and sometimes replace traditional modes of networking and knowledge exchange. Analysing these transformations through the prism of sociology enables us to better understand the social and cultural stakes involved in the attempt to integrate digital technical systems into the crafts, and to adopt policies to support and preserve craft heritage at national and European levels accordingly.

2.2 Overview of Cultural Policies in Europe

The European Union's cultural policies have evolved as part of an effort to promote CH, foster cooperation among member states, and establish a shared European identity while respecting national diversity [88]. Underlying problems originate in the failure to properly define what is meant by 'culture' in different contexts or to identify clear and pragmatic policy objectives, although legitimate 'instrumental' use of culture is common [89]. Despite the limited financial contribution and the European legal framework [90], the EU's cultural policy initiatives have had significant symbolic and practical impacts on cultural exchange and preservation.

The European Capital of Culture initiative, launched in 1985 by Greek Minister of Culture Melina Mercouri and supported by French Minister of Culture Jack Lang, is a cornerstone of EU cultural policy aiming to spotlight the cultural richness of selected cities and promote European cultural integration [91].

The Treaty of Maastricht (1992) [92] was a significant moment, incorporating cultural policy into EU primary law and enabling initiatives like Kaleidoscope (performing and visual arts, multimedia projects), Raphael (heritage conservation), and Ariane (literary culture and reading) [93]. These programs were unified under Culture 2000 after the Treaty of Amsterdam in 1998 [94], offering streamlined funding across sectors.

EU cultural policy seeks to create a shared European identity by emphasising common heritage, such as Venice's architecture, Rembrandt's paintings, and Shakespeare's plays. However, the process of identity-building remains cautious, reflecting the need to respect national sensitivities. The requirement for unanimous member state approval on cultural policies adds complexity and can hinder rapid progress. Funding remains important, together with national programs [95].

Today, EU cultural policy continues to balance tradition and modernity, with a stronger emphasis on inclusivity, digital innovation, and sustainability [96]. Programs like the European Capital of Culture remain important, fostering cross-border collaborations and emphasising Europe's cultural diversity as a unifying strength. While the symbolic creation of a shared European identity is modest, these initiatives underline the EU's commitment to cultural wealth in a globalised world. This approach reinforces the importance of culture not only as heritage but also as a dynamic force shaping Europe's social and economic fabric.

2.3 Overview of TCs in Europe

TCs in Europe are integral components of CH, representing the diverse histories, identities, and artistic expressions of communities across the continent. These crafts are passed down through generations, often rooted in local customs, and have played a significant role in both domestic and commercial spheres. They encompass a broad range of techniques, from textile weaving, pottery, and woodworking to metalworking, glassmaking, and leathercraft, each embodying specific regional styles and methods. The diversity of European TCs is remarkable, with distinctive forms emerging from the unique cultural, geographical, and historical contexts of various regions.

2.3.1 Textile crafts

Textile crafts are one of the most varied and widespread categories across Europe. From the lacework of Bruges in Belgium [97] to the colorful woolen textiles of the Scottish Highlands [98], textiles have played a significant role in shaping European heritage. In Greece, for example, traditional weaving techniques such as "*boubouki"* (a type of loom weaving) are central to the cultural fabric of the country, with patterns that carry symbolic meanings tied to regional identity. In Cyprus, weaving has deep roots in the island's rural communities, where the *Lefkara lace [99]* tradition was inscribed on UNESCO's list of Intangible Cultural Heritage [100]. Similarly, Germany's rich textile traditions are exemplified by the *Bavarian Tracht [101]*, a type of folk costume that has strong regional roots, combining embroidery and weaving techniques passed down through generations. While these regions share a common theme of textile craftsmanship, they each demonstrate unique regional adaptations. The use of local materials such as wool in the Scottish Highlands and Cyprus's emphasis on flax in its linen weaving [102] reflects the local natural environment and the availability of resources, further underlining the diverse approaches to the same craft tradition. This diversity, while seemingly unifying, highlights the influence of local history, geography, and culture.

2.3.2 Pottery and ceramics

The tradition of pottery and ceramics is another example of European diversity. In Spain, the iconic *Talavera* ceramics from the region of Castile-La Mancha showcase blue-and-white designs that have been made since the 16th century [103, 104]. The patterns and colours used in these ceramics are unique to the region, and they reflect the Spanish influence on this craft through its Moorish heritage. Similarly, in Hungary, pottery traditions date back thousands of years [105, 106]. The *Hollóháza* porcelain factory [106], for example, represents the deep tradition of Hungarian ceramic artistry, blending European and Asian influences over centuries. Hungarian ceramics are known for their floral motifs and shapes [107]. These ceramic traditions are distinct not only in design but also in production techniques. In Castile-La Mancha, artisans rely on traditional handcrafting methods such as turning the pottery on a wheel [108], while in Hungary, porcelain production involves highly specialised techniques of moulding and glazing. In both cases, these crafts serve not only as art forms but as an expression of CH, with a direct connection to local history and customs.

2.3.3 Woodworking

Woodworking in Europe displays vast regional diversity, particularly across the Northern and Eastern parts of the continent. In Sweden and Finland, the art of "*kurbits" [109]* (traditional Swedish wood painting) and "*karelian"* woodworking [110Techniques have been used for centuries to decorate furniture, household objects, and even churches. These traditions are deeply tied to rural life and have been maintained as a way of preserving the memory of past generations. The intricacy and precision of these wooden crafts are often passed down within families, ensuring that skills are not lost over time. In the Balkans, particularly in countries like Romania and Bulgaria, woodworking is often tied to both artistic expression and utility [111, 112]. The *Maramureș* region in Romania is famous for its wooden churches and carved wooden gates, a practice that has evolved over centuries [113, 114]. In Bulgaria, the art of carving wooden furniture with floral designs and symbols related to the agricultural lifestyle is still an important aspect of local culture [115]. In both regions, these traditions provide a sense of pride, identity, and community.

2.3.4 Metalworking & glassmaking

Metalworking and glassmaking also exhibit a diverse array of practices across Europe. In Italy, the Murano glassmaking tradition on the Venetian island of Murano [116] is world-renowned, with its origins dating back to the 13th century. Venetian artisans have perfected the art of glassblowing and use it to create colourful glass pieces. Similarly, in the Czech Republic, glassmaking traditions in regions such as Bohemia have been recognised for their exquisite craftsmanship [117]. The use of local sand and minerals in the production of Bohemian crystal creates unique, high-quality glassware that is highly prized around the world. On the Iberian Peninsula, Spanish *Damascene* metalwork involves inlaying gold and silver into iron or steel, creating beautiful designs that date back to the Islamic period [118]. This technique, preserved in areas like Toledo, speaks to Spain's unique history and the influence of Moorish culture on its TCs [119]. In both these regions, the value of these crafts is not only in the finished product but also in the mastery of the artisans who continue to practice techniques passed down through generations.

2.3.5 Silversmithing

Silversmithing in Europe has a long and storied history, with regional traditions influencing both the aesthetics and techniques of the craft. In Britain, British silversmithing is renowned for its precision and design, with hallmarking practices regulated by the London Assay Office, which ensures the authenticity of silver used in crafting jewellery, tableware, and decorative pieces [120]. British silversmiths have been known for their delicate engravings, a tradition dating back to the 14th century. The art of silversmithing has evolved in line with the country's broader social and cultural developments, blending artistic flourishes with the need for functional pieces. In Scandinavia, particularly in Sweden [121] and Norway [122], silversmithing holds an important role in the regional craft traditions. Norwegian silverwork from the 18th and 19th centuries is especially known for ornate spoons, brooches, and jewellery, often adorned with motifs drawn from Norse mythology and nature [123]. Swedish silversmithing, especially from the Gothenburg region, is distinguished by a style that marries craftsmanship with modern design sensibilities [124]. This combination of history and innovation continues to define Scandinavian silversmithing today, with many artisans creatively blending historical techniques with contemporary aesthetic trends. In Greece, the town of Ioannina has become a significant centre of traditional silversmithing, contributing richly to the country's heritage of silver craftsmanship [125]. The town's silversmiths have been creating jewellery, vessels, and decorative items for centuries, rooted in techniques brought by Ottoman influences and local traditions. Ioannina's silver artisans were renowned for their work with filigree, a technique involving the twisting of fine silver wire into delicate patterns, often used in making jewellery such as rings, earrings, and bracelets. This art form, alongside larger silver pieces like candelabras and trays, became deeply integrated into local culture and commerce. The region is noted for producing some of the finest examples of Greek silverwork, a tradition that continues in the modern era. Today, silversmiths in Ioannina continue to practice these age-old techniques, producing pieces that reflect both the cultural depth of the town's past and its place in the contemporary world of fine craftsmanship. In all these regions, silversmithing is more than just a craft; it is a symbol of cultural identity and artistic heritage. While the silversmithing traditions of Britain, Scandinavia, and Greece (specifically Ioannina) differ in their design elements and historical influences, they all share a commitment to fine craftsmanship and innovation. These artisans continue to adapt their methods to modern demands while preserving the deep-rooted traditions that have made their work so valued throughout history.

2.3.6 Porcelain making

Porcelain-making represents a critical part of Europe's artistic and industrial history, with distinct traditions developing in countries such as France, Austria, and the Czech Republic [126]. The French porcelain industry, particularly in regions such as Limoges, has been famous for centuries for its delicate and elaborate designs, which set the standard for European porcelain in the 18th and 19th centuries [127]. Limoges porcelain, produced from kaolin clay [128], is renowned for its whiteness, smooth texture, and hand-painted designs. The area's porcelain tradition became synonymous with aristocratic dining and decoration, and even today, Limoges porcelain is prized for its craftsmanship. In Austria, the establishment of the *Vienna Porcelain Factory* in the 18th century marked the beginning of the country's significant contribution to European porcelain craftsmanship [129]. Austrian porcelain is renowned for its rich colour schemes and the fine detailing seen in pieces like figurines, vases, and tableware.130]. Porcelain from Austria has long been associated with both functional objects and high art, often featuring relief work and gilding. The Czech Republic, specifically the *Bohemian porcelain* tradition, is yet another example of European excellence in porcelain making [131]. Bohemian porcelain, originating in regions such as Karlsbad (Karlovy Vary) [132It is celebrated for its elegant designs and use of fine gold and floral decoration. The blending of traditional and contemporary porcelain techniques has kept Bohemian porcelain relevant on the global market, with artisans continuing to produce world-class porcelain objects

today. In all these regions, porcelain making represents not only a commercial enterprise but also a cultural art form that expresses regional identities through design and craftsmanship.

2.3.7 Marble carving

Marble carving is perhaps one of the most iconic forms of European craftsmanship, and it has historically been concentrated in countries such as Italy and Greece. Italy, with its rich history of classical art and architecture, has long been a center for marble carving, particularly in regions such as Tuscany and Carrara.133]. The quarries of Carrara are globally recognised for producing some of the finest marble in the world, and this marble has been used by renowned artists like Michelangelo and Donatello.134]. The skill of carving marble is a time-honoured tradition in Italy, where artisans continue to uphold centuries-old techniques while also innovating in contemporary sculpture. The *Carrara Marble Festival* in Tuscany showcases this living tradition, with artisans demonstrating their techniques and creating new works of art [135]. Similarly, in Greece, marble carving has been central to the country's ancient and modern cultural identity. The ruins of classical Greece, with their iconic marble columns and sculptures, display the country's historical mastery of the craft. Modern Greek artisans continue to carve marble for both decorative and functional purposes, with regions like *Naxos* and *Tinos* [136] being particularly well-known for their marble quarries and craft traditions. In addition to classical styles, Greek marble carvers today work on contemporary art pieces and restoration projects, ensuring the continued relevance of the craft.

2.3.8. Economic and social significance

The economic and social significance of these crafts cannot be overstated. In addition to their cultural value, TCs have historically been a source of livelihood, contributing to local economies through both domestic use and trade. Moreover, many crafts have strong associations with tourism [137-139], with visitors often seeking out authentic, handcrafted products as souvenirs or appreciating the opportunity to observe artisans at work. In regions like Provence in France [140] or the Scottish Highlands [141], TCs are major elements of the tourism industry, providing economic benefits while fostering cultural pride and community identity.

2.4 Challenges Facing TCs

Despite the enriched CH, TCs have several challenges impeding their continuity and relevance in modern times in Europe today [142, 143]. First and foremost, there is an effect of globalisation and industrialisation. With the advancement of mass production techniques, most consumer goods have become cheaper and more accessible, often at the expense of artisanal methods. The mass-produced article is seen to be cheaper, more efficient, and more accessible than the time-consuming and bespoke nature of TCsmanship. This has resulted in a decreased demand for handicrafts, which decreases the livelihoods of the artisans and lessens the visibility of these crafts.

Moreover, another critical barrier to the retention of traditional knowledge and skills is a generational gap in crafts. Younger generations, with increasing interest in modern technology and digital occupations, or the perspective of more lucrative career paths, have shown limited interest in careers in the craft industries.144, 145]. This decline of young apprentices and craftsmen causes a gradual erosion of knowledge necessary to continue traditional practices [146]. In many instances, it is difficult for artisans of the older generation to get successors, either willing or able to continue the work, which constitutes a

potential loss of critical skills [147]. The European Commission estimates that more than 50% of the craft industries in Europe have difficulty attracting young people, and many traditional skills are considered to be at risk of disappearing due to a lack of transmission to younger generations.

Another important factor is economic pressure. Most of the costs of production of handicrafts are much higher compared to mass-produced goods. For many artisans, these higher costs make it impossible to compete in global markets, further weakening the viability of their craft. Added to that is the general undervaluation of TCsmanship, usually unnoticed with the fast pace and consumerist perspective of modern industries. This lack of appreciation is further worsened by insufficient financial support, incomplete infrastructure, and a general lack of public awareness about the need for the preservation of such culture.

Furthermore, the rapid pace of technological change presents both opportunities and challenges for TCs. While digital technologies offer great potential in the preservation and presentation of crafts, they also cut two ways. The advent of automation and digital manufacturing, such as 3D printing, is likely to further erode the uniqueness of handcrafted goods and lead to a homogenization of products. While digital tools can indeed aid in the education and training of new artisans, there is also the potential for them to further reduce the emphasis on manual craftsmanship, altering the very essence of what defines TCs.

These challenges are further exacerbated by the lack of a clear and cohesive policy framework that could support and sustain TCs in a modern economy. While there have been some efforts by regional and national governments to recognise and protect TCs as part of CH, many policies remain fragmented and insufficient. There is an increasing need for policies that contribute not only to the protection of crafts but also to their evolution and integration into the modern economy.

2.5 Current Efforts in Sustainability and Valorisation

In response to the urgent needs of TCs, several initiatives and organisations have already been established in Europe to protect, maintain, and valorise these important forms of cultural expression. Another example is the support of intangible CH by the European Union through the European Heritage Label [148], which also contributes to the recognition of cultural assets, such as TCs. The Label, created in 2006, aims to promote a greater feeling of common European identity and to encourage the preservation efforts for crafts and other intangible cultural expressions, thus strengthening the cultural fabric of the European Union as a whole. This initiative not only aids in promoting specific craft traditions but also facilitates broader recognition and appreciation of the importance of cultural diversity within the EU.

Recognition by UNESCO of TCs as part of its Intangible Cultural Heritage of Humanity also plays an important role in raising international awareness and promoting cross-border cooperation [149]. In so doing, UNESCO safeguards TCs within this framework and helps to raise their status as critical components of global CH. International recognition further supports collaboration between countries for the protection and passing on of these skills to future generations, such as in initiatives like the UNESCO Creative Cities Network.150]. Such global recognition not only underlines the importance of craftsmanship in preserving cultural diversity but also helps generate funding and policy support for the protection of these practices.

The rise of digital technologies has also provided new opportunities for the preservation and promotion of TCs across Europe [43]. Tools such as 3D scanning and VR are increasingly being used to digitally

document and reproduce craft techniques. These technologies offer a means of safeguarding the knowledge behind these crafts in a format that is accessible to a wider audience. For instance, virtual museum exhibitions and online showcases of crafts allow people from every part of the world to learn about and be informed about traditional European crafts without geographical constraints. Digital documentation will also guarantee that valuable techniques can be passed on in a durable and retrievable format, even if the physical crafts themselves are at risk of disappearing.

Besides preservation, digital technologies have also provided artisans with a platform for global access through digital platforms of e-commerce and education. Online marketplaces like Etsy [151Among several regional craft-oriented platforms are avenues for artisans to sell their goods to any part of the world. This gives artisans a larger customer base and allows them to achieve economic viability. While global virtual markets such as Etsy provide economic opportunities for artisans to reach international audiences, they also present challenges related to the protection of CH. These include the risk of facilitating the export of culturally significant objects and the potential loss of cultural narratives when items are sold by resellers. Such practices can conflict with UNESCO conventions, such as the *1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property [152].* While our study highlights the economic potential of online marketplaces for artisans, we recognise the importance of mechanisms to regulate and monitor the trade of culturally significant objects. Addressing these issues requires policy interventions to regulate such markets, transparency measures to preserve cultural context, and initiatives to encourage direct engagement between artisans and consumers. At the same time, there is concern about the loss of cultural and historical context when items are sold by resellers rather than the artisans themselves is valid. Such losses diminish the cultural value and narrative tied to the object, which is an essential aspect of TCs. Further to the above-mentioned statement, it is important to stress in all directions that the cultural and historical context of an artefact is not just important, but it can be considered even more important than the object itself in terms of the preservation of CH. Speaking about preservation, there is a tendency to show *"the priority of maintaining a holistic context over the protection of individual objects" (p. 178)* [153, *p. 178*]. Moreover, as outlined in the article just mentioned, this idea (about the context's priority) is not entirely new: *"The priority of context over its components has been inherent in cultural heritage law since its inception", as "similar ideas were already present in acts during the reign of Theodoric the Great, the king of Italy in 493-526"* [153, *p. 171*]. To address this issue, we advocate for promoting direct-to-consumer sales by artisans, which ensures that buyers receive authentic items accompanied by their full cultural narrative.

In the same context, there is another issue that should be considered. It has been pointed out by contemporary researchers that, in some cases, online platforms help sell valuable heritage assets. For example, a Ukrainian researcher, while speaking about vintage embroidered epigraphic towels, points to the risks associated with their virtual selling: "Many of them, which are still preserved by successors of the embroideresses, are gradually being sold off by the owners. And this is where the main problem lies. These embroideries often move to their buyers without proper certification" [154]. This points out the urgent need for certification as a means of safeguarding CH artefacts and maintaining their cultural significance and contextual narrative. Of course, virtual marketplaces can be proven, especially for researchers, a valuable, open, and widely accessible medium for locating and preserving digital documentation of these cultural objects for further study.

E-learning platforms have also emerged to support education and training in TCs [64]. This would involve the training of young people in these skills through online courses and digital workshops, which would bridge the generational gap and encourage the transmission of knowledge about craftsmanship in more

interesting and accessible ways. These digital tools are important in ensuring that TCs remain economically viable and socially relevant while their contents adapt to the needs of modern consumers.

2.6 Role of Education and Training

Education and training are indispensable regarding the sustainability and preservation of TCs since they provide the necessary frameworks within which knowledge can be transmitted, and skills developed [155, 156]. In this respect, European TCsmanship depends on both formal and informal educational pathways regarding passing on the techniques, knowledge, and creativity invested in these practices to a new generation of artisans [157]. However, the challenges of declining interest in crafts among young people, the erosion of master-apprentice relationships [158], and the demand for new, more flexible educational models requires new solutions to bridge the gap between tradition and modernity.

On the European level, the incorporation of craft education into both systems of formal schooling and informal training has been a constant process. Most countries have a long tradition of apprenticeship systems, where young artisans learn directly from masters in workshops. Practice is still widespread in countries such as Italy, France, and Germany [159- 161]. These apprenticeship models are part of the preservation of craft traditions, as they allow hands-on learning and facilitate the transmission of tacit knowledge, skills and techniques that cannot be easily codified in textbooks. The apprenticeship also develops a deep attachment to the craft, which reinforces cultural pride and personal identity linked with the work [162]. These systems increasingly face pressure due to changes in the labour markets, away from manual labour industries to service and digital-based industries.

Due to this gap in generations and due to an ever-changing global economy, it was imperative to incorporate digital tools and modern pedagogical approaches into education for craftsmanship. E-learning platforms or web-based courses open opportunities to include learners of all ages with access to training in crafting activities from anywhere in the world, thus making education even more flexible and accessible on a worldwide scale [163]. Digital platforms such as Skillshare [164] and Coursera [165] give their users access to an extensive set of courses on practically any subject, from TCs like woodworking, pottery, or textiles to many other related topics. These platforms facilitate learning with the use of video tutorials, interactive content, and virtual workshops, which have become essential basic tools for remote education during the COVID-19 pandemic [166]. Moreover, through digital technologies, artisans can now reach a global audience, creating space for international exchange and collaboration.

Running parallel to these technological developments is a growing interest in the integration of immersive technologies such as virtual and AR into craft education [167]. These provide a unique opportunity to engage learners in interactive, experiential learning environments. For example, these can simulate the process of crafting, allowing students to virtually practice skills that are otherwise difficult to access in real life, such as glassblowing or metalworking [62]. Similarly, AR can overlay instructions on real-world environments, guiding learners to engage with physical materials, such as weaving or pottery [168]. These technologies not only enhance the learning experience but also make it easier to preserve and teach techniques that may otherwise be lost or underrepresented.

Formal academic institutions have also risen to these challenges by establishing specialised programs and degrees in the study of TCs. For example, the University of Gothenburg in Sweden offers a Master's in Design for Craft Practices, which merges TCsmanship with modern design thinking [169]. Similarly, the Royal College of Art in the UK, along with other prestigious European schools of art and design, has

introduced programs that merge craft traditions with state-of-the-art design and technology [170]. Such an academic curriculum would train students to work not only as artisans but also as innovators in the craft sector, to ensure the relevance of TCs in contemporary markets.

Besides, initiatives like Crafting Europe and numerous national programs aimed at the reinforcement of craft education through cross-border collaborations to create a European curriculum on TCs [171]. These also ensure that standards and quality in education are harmonised and promote the mobility of artisans and educators, paving the way for the free flow of knowledge across borders and the preservation of CH at a pan-European level. Such initiatives will encourage transnational exchange opportunities and collaboration to bring together different craft traditions while upholding the values of sustainability and innovation.

Finally, it is impossible to overstate the role of education and training in making TCs sustainable [143]. New technologies and methods of education continue to offer great prospects in preserving, teaching, and innovating in the craft sector. These efforts, however, need to be supplemented with strong policy support and continued investment in both formal and informal education if TCs are to thrive in the future.

2.7 Role of European Policy

The role of European policy in sustaining TCs is critical for making those practices relevant and viable economically. Whereas TCs contribute much to Europe's CH and local economies, there are many challenges they are facing, including globalisation, industrialisation, and erosion of traditional skills. Effective policy frameworks are needed to protect, promote, and revive these crafts, which should foster an enabling environment that encourages innovation, sustainability, and cross-border collaboration.

At the European level, several initiatives and policies have been developed to address such challenges. Among these instruments, one of the most important is the European Heritage Label, a recognition given to CH sites, including TCs, and their contribution to the European identity [172]. The European Heritage Label promotes the diverse CH of Europe, encouraging the arts professions, showcasing their work, and connecting with wider audiences while supporting tourism and local economic development. Similarly, the Creative Europe program supports the cultural and creative sectors in funding projects that combine TCs with contemporary practices and digital innovation [173]. Creative Europe supports the survival of TCs and their development within the contemporary creative economy through financial means and the enhancement of transnational cooperation.

The second highly important European policy-level initiative is the strategy for the Cultural and Creative Industries (CCI), which already positions TCs within the context of the creative economy [174]. CCI policy supports the sector with funding opportunities, skill development, and initiatives encouraging entrepreneurship among artisans. The Digital Agenda of the European Union also provides crucial support to the integration of digital tools and technologies into design practices [175]. Through initiatives such as Horizon 2020 [176] and Horizon Europe [177], funding is provided for research into digital innovation for the craft sector. Research results have the potential, with their practical application, to support craft businesses expand their market reach and adopt new digital technologies.

Moreover, European policies concerning sustainability have important implications for the traditional craft sector. The European Green Deal [24] is a complex initiative to make Europe the first climate-neutral continent, bringing many challenges and opportunities for TCs. On the one hand, craftspeople should

integrate environmental standards into the production process; on the other hand, TCs are aligned with sustainability goals since they often use natural materials and low-impact production methods. Policy initiatives that will lead towards sustainability in the craft sector, such as incentivising eco-friendly production methods and encouraging the use of renewable resources, are relevant for the long-term viability of TCs within a sustainable economy.

The European Union has, in turn, identified that there is an increasing need for more intense cross-border collaboration to safeguard and promote traditional craft. Initiatives such as European Capitals of Culture and Erasmus for Young Entrepreneurs [178] permit artisans to participate in cultural exchanges, best practices, and reach markets other than their national ones. Such initiatives essentially facilitate the process for artisans to widen their networks, learn new skills, and combine modern design thinking with traditional techniques. Notwithstanding different efforts at the European level, there is still a lack of more coordinated policies to deal with specific challenges that TCsmanship faces at both national and regional levels. A unified European strategy concerning TCs would be very welcome to harmonise efforts among the member states and ensure that artisans have consistent access to funding opportunities, training programs, and digital infrastructure. Policymakers should also focus on ensuring that TCs are integrated into broader cultural and economic policies, recognising their value not only as CH but also as a key driver of sustainable local economies.

3 Methodology

This study is based on ethnographic research conducted within the framework of *Craeft*, which explores the preservation and revival of TCs across Europe [179]. The research investigates eight craft instances, providing an examination of traditional craft practices, educational frameworks, and the impact of policy and digital technologies. The selected craft instances span a wide range of regions and disciplines, offering insight into diverse cultural contexts and the challenges faced by artisans today.

3.1 Research Design

This research is based on three main pillars: the interdisciplinary nature of its approach, the centrality of the role of artisans, and the comparative perspective. Its methodological orientation is based on an ethnographic protocol co-designed by social scientists and computer science researchers. This multi-phase protocol has been implemented throughout the craftsmanship instances covered. The ethnographic approach is complemented by the collection of financial data gathered from the various educational, heritage, and business institutions that constitute the fabric of each craft instance. This research aims to provide an in-depth understanding of the factors influencing the sustainability of these crafts, focusing on defining the areas for potential interventions through the analysis of research data and then identifying those interventions at a craft level and an education and training level.

For the application of such interventions on a European scale, there is a need to complement actions with adaptations to the policy framework and adaptation of existing policies to include crafts.
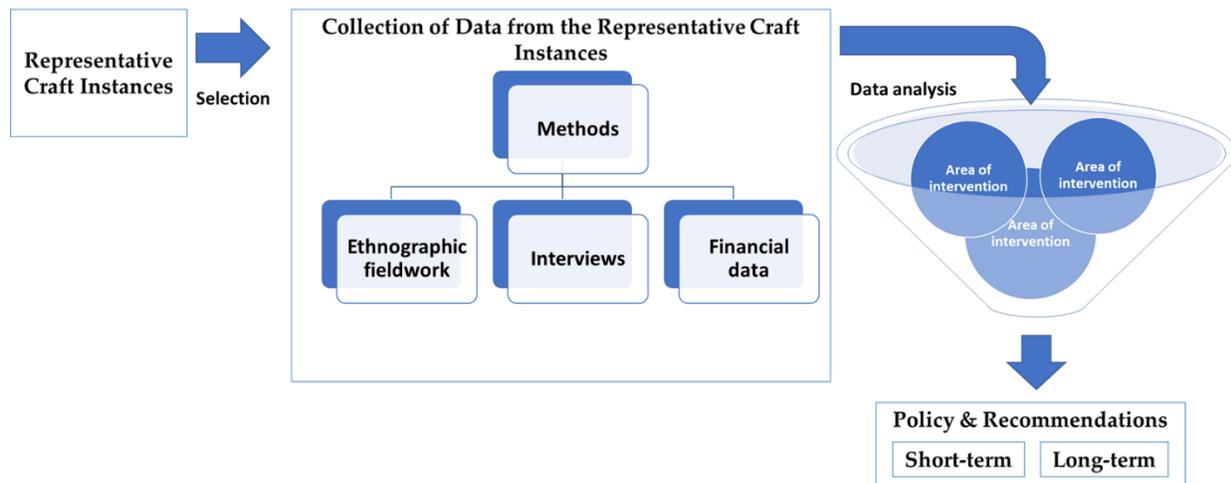
Figure 1. Overview of Research Design.

From this endeavour, we have the ambition of providing a deeper understanding of the factors that influence the sustainability of these crafts. More specifically, **c**ase studies and field observations examine how craft practitioners integrate technologies, uncovering both the challenges and opportunities of such tools. Furthermore, it allows us to study the potential for such integration in the future. Educators and trainees in craft schools help us explore how knowledge transfer evolves or can evolve with digital tools by identifying gaps in traditional and modern educational approaches and how curricula can integrate

new skills without diminishing heritage practices. Policy documents and stakeholder interviews allow us to evaluate existing measures supporting crafts. This approach seeks to identify effective policies or to define the need to adapt existing policies to support sustainability at the regional and EU levels.

3.2 Data Collection

3.2.1 Ethnographic Fieldwork and Recording

The ethnographic protocol involves the convergence of diverse methodological approaches and disciplinary traditions within the Social Sciences and Computer Sciences. The protocol aims to enhance understanding of craft processes through various methods of data collection, including operational sequences, professional biographies, tacit knowledge, and practitioners' movements. Its interdisciplinary approach seeks to refine the understanding of different technical processes in craft work environments, generating comparable data and providing tools for analysis.

Its collaborative perspective enabled a process of co-creation that placed the experience of artisans at the centre of strategies for understanding craft and integrated the knowledge systems and perspectives of both researchers and craft communities. The fieldwork of each of the artisan instances was carried out in their respective workshops, workspaces, and craft-related institutions, allowing for detailed observations focusing on technical processes, daily routines, interactions between artisans, and the interaction between artisans, tools, materials, objects, and workplaces. Starting from the centrality given to the artisans, the different methodological tools made it possible to make a key selection of the technical gestures representative of each craft, to link their training trajectories with their technical-professional choices, and, based on their experiences, to address cross-cutting themes such as sustainability and valorisation within the artisanal sector.

3.2.2 Interviews

Following the structure of the ethnographic protocol, the interviews with professional craftspeople were organised in two distinct phases that respond to different methodological orientations and seek to generate and collect different types of data.

Interviews were conducted with craft masters, craft educators, and craft students from various regions of Europe. Craft masters and educators had at least 10 years of experience in their respective craft traditions or learning subjects. Students were selected among the cases where an organised educational program and curricula existed.

The participants were selected by the partners participating in Craeft, responsible for representative craft instances and their collaborators. More specifically these organizations include CERFAV (European Center De Recherches Et Formation Aux Arts Verriers), le CNAM (Conservatoire national des arts et métiers), National School of Art and Design, Limoges (ENSAD, Limoges), PIOP (Piraeus Bank Cultural Foundation), Silversmithing Museum of Ioannina, Tinos Marble Museum, Individual Marble carvers in Tinos, Ioannina Centre for Traditional Handicraft (KEPAVI), traditional silversmiths at the region of Ioannina, CETEM (Technology Centre of Furniture and Wood), Individual woodcarvers from the region of Yecla Spain, Individual potters and textile weavers from the region of Heraklion and Rethimno in Crete. A purposive sampling method was followed to ensure diverse representation across. The sampling aimed to capture

the perspectives of artisans, educators, entrepreneurs, and academics in art and design. The objective was to cover a wide range of traditional skills, educational practices, and entrepreneurs.

Semi-structured interviews were conducted with craft masters and senior practitioners applying the sociology based on the life course approach [180] to study how craft practices develop and evolve, emphasising the interplay between their technical activities, social experiences, and personal biographies. **These interviews allowed in-depth conversations about the challenges and opportunities within their particular craft, the integration of digital technologies, and their views on education and training.** This methodological approach analyses how career trajectories are constructed and how life events, historical influences, and personal choices influence professional practices, knowledge acquisition, and the transmission of craft skills, allowing craft practices to be contextualised within broader life and social dynamics (see Annex A). Interviews with craft educators were conducted in formal education spaces. These interviews aim to explore their perspectives on teaching methodologies, the integration of traditional and modern practices in craft education, the challenges they face in transmitting skills to new generations, and their views on how educational programs can adapt to evolving technological, cultural, and economic contexts. These conversations also seek to understand how educators inspire creativity and innovation among students while preserving the cultural and historical significance of traditional crafts (see Annex B). The interviews with craft students aim to understand their motivations for pursuing a craft, the influences of family, culture, and community on their decisions, and their aspirations for the future. These conversations also seek to explore how students balance traditional practices with modern technologies, their experiences of learning from educators and mentors, and the challenges and opportunities they encounter while studying and, in some cases, working simultaneously in their chosen craft (see Annex C).

In the second phase, which follows the phase of capturing and recording the gestures, interviews were carried out based on video-elicitation techniques in which the practitioners were confronted with the video recordings of their gestural activity in progress. During these interviews, practitioners are invited to describe their actions, their gestures, and their intentionality. The objective of this methodological approach is to collect the personal and emotional data linked to craft practices, allowing for the explicit making of the practitioners' tacit knowledge (see Annex D).

3.2.3 Financial Data Collection

Financial data was collected from the participating museums, craft training organisations, and entrepreneurial ventures regarding the economic viability and sustainability of TCs. This includes revenue derived from craft sales, funding for education and training programs, and expenditures related to the preservation of traditional techniques. The financial data allows for analysing the economic impacts of craft practices and identifying models that contribute to the sustainability of the crafts.

3.3 Data Analysis

Qualitative and quantitative data analyses were done through ethnographic fieldwork data, interview data, and financial record data.

3.3.1 Qualitative Data

Thematic analysis was performed on the ethnographic data, comprising field notes and interviews. The themes identified and explored in-depth included those relating to sustainability, the role of digital technologies, and the influence of education and policy frameworks. Such an analysis provides a clear insight into the lived experiences of artisans, the challenges faced by them in continuing traditional craft practices, and their perceptions regarding the integration of new technologies.

More specifically, the qualitative data that we had at our disposal from the ethnographic fieldwork included: (a) practitioner recordings in video from multiple angles, including egocentric recordings, life stories of the practitioners using the life course approach, self-reflections on their craft practice collected by having the practitioners observe their craft methods and reflect, fieldnotes of the ethnographers, transcripts from semi-structured interviews. For the thematic analysis, we followed Braun and Clarke's framework [181]: (a) Familiarisation with the data: All recordings, life stories, self-reflections, fieldnotes, and interview transcripts were transcribed (where applicable) and thoroughly reviewed to gain a deep understanding of the content, (b) Generating initial codes: Data were systematically coded to identify recurring patterns, concepts, and narratives. Codes were derived from both inductive (data-driven) and deductive (theory-driven) approaches., (c) Searching for themes: Codes were grouped into broader themes based on their relevance to the research objectives, such as sustainability, the role of digital technologies, and the influence of education and policy frameworks., (d) Reviewing themes: Themes were refined and validated by cross-checking with the original data to ensure consistency and accuracy. For example, life stories and self-reflections were used to validate themes emerging from interview transcripts and fieldnotes. (e) Defining and naming themes: Each theme was clearly defined and labelled to reflect its significance. For instance, themes related to the life course theory [182] highlighted key transitions, challenges, and adaptations in artisans' careers. (f) Producing the report: The findings were synthesised into one report per craft instance.

The life course approach was particularly valuable for understanding how artisans' personal and professional trajectories intersected with broader socio-economic and cultural changes. Self-reflections provided insights into their creative processes, motivations, and perceptions of their craft practices.

3.3.2 Quantitative Data

The economic analysis focused on understanding the dynamism of the craft sector in each case study by examining four key dimensions: museum visits, tourism involving traditional crafts, and the income of craft practitioners. This approach provided a holistic view of the financial situation in the craft sector and informed the alignment of recommendations with economic realities.

Museum visits: Data on visitor numbers and engagement with craft-related exhibitions were collected from local museums. This information helped gauge public interest in traditional crafts and their cultural significance.

Tourism data: Tourism statistics, including the number of visitors participating in craft-related activities (e.g., workshops, craft fairs), were analysed to assess the role of tourism in sustaining the craft sector.

Craft practitioners' income: Income data from artisans were collected through interviews and self-reported financial records. This provided insights into the economic viability of craft practices and the challenges faced by artisans in sustaining their livelihoods.

Craft training organisations: The analysis of figures for craft training organisations allowed us to assess their economic viability and whether they will remain sustainable in the future, and at the same time, the interest in getting trained in traditional crafts through the participation of young students and apprentices in their training programs.

The analysis was interpretive rather than formal, focusing on identifying trends and patterns rather than statistical rigour. For example, correlations between tourism growth and artisan income were explored to understand the economic impact of tourism on the craft sector. Similarly, museum visit data were used to assess the role of cultural institutions in promoting traditional crafts.

3.4 Application of the methodology in case studies

3.4.1 Case studies selection

The eight craft instances studied in Craeft represent a wide variety of European traditions and contexts. These include:

- Aubusson Tapestry (France) is a very old textile craft producing extremely intricate woven tapestries.
- Limoges Porcelain Making in France, which is supported by the School of Fine Arts in Limoges.
- Silversmithing at Ioannina, Greece, is supported by local museums and the association of artisans.
- Textile Weaving at Crete consists of artisan entrepreneurs who conserve traditional weaving in Crete.
- Traditional Woodcarving within the region of Yecla, Spain.
- Glass Blowing at the Cerfav (France) is a craft training organisation concerned with both contemporary and traditional glass-blowing techniques.
- Pottery Making at the Margarites Village, Crete, Greece, specialises in traditional pottery making, connecting historical practices with modern uses.
- Marble Carving at Tinos, Greece, supported by local museums and artisans.

The cases were selected for geographic diversity, the different craft forms they represent, and involvement in various educational and policy frameworks. Both artisanal workshops and educational institutions are represented to provide a balanced overview of current challenges and potential solutions for safeguarding and promoting TCs. The diversity of these practices and their socio-cultural contexts increases the complexity of data collection, providing a set of elements for analysis. The comparative perspective and its interdisciplinary approach highlight this diversity, intending to encourage dialogue between different gestural knowledge. The aforementioned diversity is summarised in Table 1.

Table1. Summary of the diversity of craft

Case	Material type	Bound to context	Active educational programs	Active Training Programs	Availability for ethnography	Education curriculum availability	New designs and artworks	Supported by a CH, museum
Glass	Mineral	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Porcelain	Mineral	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Clay	Mineral	Yes	No	No	Yes	No	Yes	No
Marble	Mineral	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wood	Flora	Yes	No	No	Yes	No	Yes	No
Silver	Mineral	Yes	Yes	Yes	Yes	No	Yes	Yes
Aubusson tapestry	Fibres	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wool textiles	Fibres	Yes	No	No	Yes	No	Yes	No

Table 2 presents the rationale for the selection of each case study to prove their applicability for studying the European Crafts sector. Our selection is based on the material used in the craft, the type of processing of the material (e.g. freeform transformations, subtraction, interlocking, additive, etc.), the social and historical context, the products of the craft, the types of education applied (formal, informal, apprentice-based), the curricula used and the new dimensions on crafts based on adopting modern technologies and art and design principles.

Table 2. Use case selection rationale

Glass (mineral, free-form) **Context**. For the last 250 years, Vannes-le-Châtel has had an increasingly strong celebration of the city's glassmaking tradition. CERFAV is an Apprentice Training Centre for glassworks. **The product** range is extremely broad (utilitarian, art, scientific, and other). CERFAV safeguards, transmits, and valorises know-how **Education** CERVAF covers the spectrum of training courses related to glass material, art, technique, and technologies. **Training** in glassblowing. **Ethnography @** CERFAV **Curriculum** CERFAV Vocational Training Certificate CAP, French diploma for secondary studies and vocational education on the art of glass and crystal. **New** artistic goblet/cup design, recovery of designs & techniques using experimental archaeology (J. P. Mateus, glass master, two apprentices).	**Porcelain** (mineral, free-form) **Context:** Limoges, France, is the French capital of ceramic arts. Since the 18th century, Limoges porcelain has been at the top of the market. **Products** are finely decorated pottery of characteristic colour and impeccable texture. **Education** in kaolin extraction, composition recipes, moulding, pouring, enamelling, and firing of this special clay **Training** free-form shaping and fine decoration **Ethnography @** porcelain studio of ENSA-Limoges, collaborating with CNAM. **Curriculum** ENSA-Limoges. **New** decoration styles & artworks (G. Meynard, ceramic designer, director of Porcelain Studio, of ENSA-Limoges).
Clay (mineral, free-form)	**Marble** (mineral, subtract)

Context: Ancient and modern Cretan pottery are practised at the Kerameion in Crete, Greece **Products** are utilitarian and artworks. Seminars are held for international students and visitors, disseminating pottery to the public. Visitors view and participate in the demonstration of traditional pottery for schools and adult groups. **Education,** clay recipes, motif semiotics, and wood kiln firing conditions. **Training** all stages from soil collection, clay kneading, shaping pottery on the wheel, burnishing with pebbles, firing pottery in a wood kiln, and decorating with natural pigments. **Ethnography @** Kerameion is a partner of the Psiloritis UNESCO Global Geopark [184] and its products are distinguished by a collective mark. **Curriculum:** pottery and archaeological experimentation workshops. **New** contemporary products and artwork (G. Dalamvelas, pottery master & instructor).	**Context:** Tinian marble craftsmanship (UNESCO inscription 2015 [183]) is an expression of the cultural identity of Tinos, Greece. Its highly esteemed artwork crossed borders three centuries ago. **Products** are mansions, churches, cemeteries, sculptures, built structures, and homeware. **Education** quarrying, splitting large marble blocks into smaller, sanding, and cutting with diamond-studded wires **Training** in handwork training on subtractive techniques for marble. **Ethnography @** Preparatory & Professional School of Fine Arts of Panormos of the island of Tinos, the official institution for the transmission of Tinian marble crafts, collaborating with PIOP's Museum of Marble Crafts at Tinos. **Curriculum** Preparatory & Professional School of Fine Arts of Panormos **New** designs and artworks (instructors from the Fine Arts School of Panormos)
Wood: woodcarving (flora, add/subtract) **Context:** Yecla, Spain, is a cluster of industrial furniture production; its fair is the oldest in Spain. Yecla furniture is protected as products of the Murcia Region by a "brand of guarantee label", from the Spanish Chamber of Crafts, certifying quality, components, origin, and techniques. The Murcia region has a high tradition of carpentry and carving. **Education** (1) drawing/printing of design on the wood surface (2) First Carving/rough-down (3) Draw-up, rough carving, which sculpts the design, (4) Draw-up, edges, create figure outlines and refine small details, (5) Finishing: polishing, painting, protecting, varnishing. **Training** Handwork training of the subtractive techniques of woodcarving **Ethnography @** Chamber of Crafts of Murcia Region will collaborate with CETEM to ensure the protection of wood creations. Old wood will be reused.	**Silver** (mineral, add/subtract/free-form) **Context:** Silversmithing (and goldsmithing) has been inextricably linked to the CH of Ioannina, Greece, since the 13th century. These crafts developed, flourished, and gave rise to interaction with other centres in the Balkans and the West. Products are jewellery, silverware, and – in the past – armoury and armature. **Ethnography @** Centre of TCs of Ioannina, collaborating with the Silversmithing Museum at Ioannina of PIOP. **Education** raising (sheet drawing and shaping the object's form), sand casting. **Training** free form (moulding, repoussé, chasing), subtract (engraving, filigreeing), and add (use of niello). **Curriculum:** Centre of TCs of Ioannina **New:** contemporary products (instructors of the Centre of TCs of Ioannina)

Curriculum includes industrial training at CETEM and handicraft training to create sculptures from old wood pieces. **New** styles and products (instructors of CETEM and A. Martín, PhD in Arts and wood carving master). Old wood pieces from derelict rural houses will be converted into new products.	
Wool: Aubusson tapestry (fibres, interlock) **Context:** Aubusson tapestry (UNESCO inscription, 2009 [185]) consists of weaving an image and is an international Gold Standard. Products are large decorative wall-hangings, rugs, and furniture coatings. **Education** encoding motifs in the weft, dyeing recipes **Training** sheep breeding, shearing, washing, carding, combing, spinning, dyeing, and weaving, or interlocking, of wool strings into patterned fabric **Ethnography @** Villa Châteaufavier. **Curriculum** Villa Châteaufavier, ENSA-Limoges **New:** decoration motifs and styles (C. Vignau, textile designer, director of the textile studio, ENSA-Limoges)	**Wool, cotton textiles** (fibres, interlock) **Context:** Weaving and knitting were known in all civilisations from ancient times, and their mechanisation led to the Industrial Revolution. Fabrics and textiles are ubiquitous in everyday life and the past. **Education** Weaving has been well studied in the literature and industrial manufacturing. **Training:** traditional weaving and decoration of fabrics with knitting and sewing. **Ethnography @** workshops of the Women Entrepreneurs Association of Crete that collaborates with FORTH. **Curriculum for** informal learning in duals. **New** designs, materials (glass fibres), contemporary products and garments (M. Pitsikaki, weaver and CEO of the association), reuse of wool spared in husbandry, and natural dyes.

3.4.2 Selection rationale

The selection of cases for this study was guided by a combination of theoretical, geographical, and craft diversity considerations. The primary aim was to capture a wide spectrum of practices, challenges, and innovations, reflecting the current dynamics of the craft sector. Our key criterial foe this selection were:

Craft Diversity and Representativeness: Selected crafts encompass a range of materials, techniques, and production scales. These included both material-specific crafts (e.g., glassblowing, silversmithing) and process-oriented traditions (e.g., weaving, marble carving) to illustrate how distinct sectors face shared and unique challenges.

Geographical Distribution: To ensure a pan-European perspective, cases were chosen from various regions, including northern, southern, and central Europe. This approach highlighted differences in cultural heritage approaches, economic landscapes, and policy environments.

Cultural and Historical Significance: The selected crafts hold significant historical and cultural importance within their communities and contribute to the local or national heritage landscape. This criterion ensured that the cases reflected crafts with long-standing traditional practices.

Economic and Sustainability Factors: Emphasis was placed on cases that demonstrate varying levels of economic viability and engagement with sustainability initiatives. This helped capture the transition from traditional models to more innovative or environmentally aligned practices.

Educational and Training Integration: Crafts with robust educational frameworks or apprenticeship models were prioritised to understand how knowledge transfer is maintained and modernised.

Technological Innovation: Particular attention was given to cases incorporating technological advancements, such as digital tools, 3D scanning, or AR-based training methods, to assess their impact on craft preservation and market engagement.

Policy and Community Support: Cases were selected based on the presence of supportive policy frameworks, community-driven initiatives, or institutional backing to understand how external factors influence craft sustainability.

The combination of these criteria ensured a comprehensive sample that provided a balanced view of TCs' challenges and opportunities. A comparative approach was adopted to identify patterns, success factors, and areas requiring policy and educational intervention. The study aimed to produce actionable insights applicable across diverse contexts while preserving the distinctiveness of each craft tradition.

3.4.3 Representativeness of the use cases

The selected crafts offer a well-rounded and geographically diverse sample, reflecting shared characteristics, challenges, and opportunities within traditional crafts across Europe. Below are key similarities with other European craft practices that further validate the selection as representative of the region's traditional craft landscape:

Textile Arts (Aubusson Tapestry, Crete Weaving): Aubusson tapestry represents intricate and heritage-driven textile production, a tradition deeply rooted in French cultural history and recognised for its sophisticated craftsmanship [185]. This tradition aligns with practices in Flanders, Belgium, and Central Italy (Umbria), where woven textiles have historically been essential components of cultural identity and artistry [186]. The textile weaving tradition in Crete shares similarities with practices in Växbo, Sweden, where traditional hand-loomed textiles have experienced renewed interest through artisan entrepreneurship [187]. Both European practices face challenges regarding market relevance and the preservation of traditional techniques [188]. On a broader, global scale, these textile traditions connect with Asia and India, where weaving holds a similarly significant cultural and artistic heritage [189]. In India, the Banarasi and Kanjeevaram silk weaving industries are renowned for their intricate patterns and deep historical roots [190]. These crafts, much like Aubusson tapestry, are embedded in local identity and rely heavily on skilled craftsmanship and generational knowledge transfer. Similarly, regions such as Varanasi and Tamil Nadu face challenges in preserving traditional methods while adapting to modern market demands [191]. In East Asia, particularly in China and Japan, traditional weaving techniques such as brocade from Suzhou and Nishijin-ori from Kyoto share the meticulous and elaborate craftsmanship seen in Aubusson tapestry production [192]. Both crafts employ complex patterns and luxurious materials,

often reserved for ceremonial and high-value purposes [193]. As in Crete and Växbo, these Asian weaving traditions have also seen renewed interest through artisan entrepreneurship and innovation, often integrating sustainable practices and digital marketing strategies to reach global markets [194].

Ceramics and Porcelain (Limoges Porcelain, Margarites Pottery): Limoges porcelain making in France is internationally renowned for its fine craftsmanship and high-quality ceramic production, with strong educational and institutional support from the School of Fine Arts in Limoges. Similarly, pottery making in Margarites, Crete, Greece, has deep historical roots, preserving traditional forms while adapting to contemporary designs and uses. Both traditions exemplify the delicate balance between heritage preservation and innovation. These European ceramic traditions share parallels with significant practices in Asia, where porcelain and pottery have long histories of artistic and cultural importance [195]. In China, Jingdezhen is famously known as the "Porcelain Capital of the World," producing fine porcelain for over a millennium. The intricate techniques and aesthetic standards developed there have influenced global ceramic production, including Limoges porcelain [196]. In Japan, the ceramics tradition thrives in regions such as Arita and Seto, known for their distinctive styles and high craftsmanship standards. Japanese potters often blend traditional methods with modern aesthetics, similar to the innovations seen in Margarites's pottery [197]. Likewise, Korean ceramics, especially Goryeo celadon and Joseon white porcelain, are revered for their elegance and technical precision, much like the refined craftsmanship of Limoges porcelain [198]. South Asian traditions, particularly in India, also have a rich ceramic heritage. The terracotta pottery of West Bengal and the blue pottery of Jaipur showcase intricate patterns and vibrant colours, echoing the creative ingenuity seen in Margarites's pottery [199]. These practices, often tied to local cultural identities, have adapted to modern trends while maintaining traditional techniques. Across Europe and Asia, ceramics and porcelain craft share common challenges, including competition from mass production, the need for technical training, and the preservation of traditional knowledge. However, through educational institutions, artisan cooperatives, and technological advancements, these crafts continue to thrive and maintain their cultural significance in an increasingly globalised market.

Metalwork (Ioannina Silversmithing): The silversmithing tradition of Ioannina boasts a rich heritage influenced by Byzantine, Ottoman, and Eastern Orthodox cultural elements [200]. During the Ottoman period, Ioannina emerged as a key centre for exquisite silver craftsmanship, specialising in techniques such as filigree and repoussé, which were often used for religious and ceremonial objects [201]. This craft shares strong ties with the silverwork traditions of the Eastern Orthodox Church, where silversmithing played a crucial role in the creation of sacred artefacts, such as liturgical vessels, icon frames, and reliquaries [202]. The influence of Byzantine aesthetics extended beyond Greece into Russia, Serbia, Bulgaria, and Romania, shaping the design and ornamental motifs of religious silver objects [201]. In Russia, particularly from the 17th century onward, the Russian Orthodox Church commissioned elaborate silver and gold ecclesiastical pieces, which often mirrored the intricate styles seen in Ioannina and other Balkan regions [203]. Artisans from both traditions excelled in repoussé work and delicate engravings used for religious icons and chalices. The continuity of these shared traditions highlights the transnational influence of Eastern Orthodox Christianity on silversmithing. Ioannina's artisans continue to carry this legacy forward, blending their Ottoman and Byzantine heritage with broader Eastern European ecclesiastical design elements, maintaining a unique position within the European silversmithing landscape.

Woodcarving (Yecla Woodcarving): Traditional woodcarving in Yecla, Spain, mirrors woodcraft traditions found in the Alpine regions of Austria and Switzerland, where both religious and decorative woodcarving have been maintained for centuries [188]. Similar to Yecla, these regions face challenges in sourcing sustainable materials and passing on skills to new generations [204].

Glass Blowing (CERFAV): The CERFAV glass-blowing training organisation shares a pedagogical approach similar to other European centres for glass craftsmanship, such as the Royal College of Art Glass Workshop in London and the Ebeltoft Glass Museum in Denmark.205]. These institutions blend traditional and contemporary techniques, playing a vital role in introducing modern design while safeguarding heritage practices [206]. Furthermore, the renowned glassblowers of Murano in Italy, who have upheld centuries-old techniques for producing intricate glass artefacts, offer a parallel to CERFAV's efforts in preserving artisanal skills while promoting innovative applications [207]. Similarly, the glass artisans of Rattenberg in Austria, particularly the Molter glass workshops, are renowned for their delicate glass creations and dedication to passing down traditional knowledge through generations.

Stone Craft (Tinos Marble Carving): The marble carving tradition of Tinos is deeply rooted in ancient Greek craftsmanship, which has significantly influenced European stonework practices [208]. The artisans of Tinos inherit techniques that date back to the Classical period, where Greek sculptors and stonemasons crafted monumental works such as the Parthenon and the Temple of Apollo at Delphi.209]. This heritage connects naturally with the broader European tradition of stone craftsmanship that flourished during the Roman Empire [210]. Roman builders adopted and expanded upon Greek techniques, leaving a legacy of stone-carved aqueducts, temples, and statues across the continent [211]. In Italy, regions like Carrara continue to be synonymous with high-quality marble carving, while Portugal's Alentejo region is famous for its stone craftsmanship rooted in Roman-era techniques [212]. This enduring tradition exemplifies the shared European heritage of stone carving, with Tinos standing as a vital link between ancient practices and modern craftsmanship.

3.5 Application of the methodology in case studies

Case studies were developed for each of the eight craft instances, providing detailed insights into the specific challenges and opportunities facing traditional craft practices in different European contexts. The case studies contain descriptive accounts of the craft processes, together with an analysis of the impact of educational programs, digital technologies, and policy frameworks. The case studies will highlight and demonstrate successful examples of TCs integrated with digital technologies, such as 3D scanning, VR, and digital reenactment, for their preservation and promotion. Also, investigate the role of education and training within the craft sector, focusing on how artisans and educational institutions adapt to changing markets and new technology. Finally, assess the effectiveness of European and national policies in supporting TCs, including funding mechanisms, CH initiatives, and sustainability agendas.

One should note that the scope is limited to the eight craft instances that were selected for analysis in this study. These cases provide a good cross-section of TCs in Europe, but they do not reflect all craft types or regions of Europe. Moreover, in using the ethnographic approach, rich qualitative data could be elicited, but the reading and interpretation of field notes and interviews may lead to the influence of one's perspective and the specific context in each instance.

4 Findings and Analysis

This section presents the key results of the research, drawn from ethnographic fieldwork, interviews, and data analysis of eight traditional craft practices across Europe. The analysis reflects the expertise and perspectives of craft masters, educators, and museum professionals, whose insights provide a deeper understanding of the peculiarities, challenges, and opportunities within these crafts.

4.1 Overview

Craft masters emphasised the unique cultural and historical significance of their practices, highlighting how these crafts are deeply tied to local identities and traditions. For instance, silversmiths in Ioannina discussed the influence of the region's Ottoman-era heritage on their intricate designs, while weavers in Aubusson described the integration of storytelling into tapestry-making. Museum experts contributed valuable context, particularly in identifying how crafts like marble carving and Margarites's pottery maintain historical techniques while adapting to contemporary aesthetics.

The interviews revealed widespread concerns about declining interest among younger generations, as noted by educators from CERFAV and the Limoges School of Fine Arts. Many craft masters expressed fears of a "skills gap" emerging as older practitioners retire without adequate successors. Financial pressures and difficulties accessing broader markets were also recurring themes, with museum experts observing that these issues are compounded in rural or remote regions.

Despite these challenges, participants identified numerous opportunities for revitalising TCs. Educators from CERFAV and Limoges highlighted how integrating digital tools like 3D modelling into training programs has modernised TCs, attracting younger talent and enabling innovative designs. Craft masters in Crete and Yecla emphasised the importance of sustainability, with examples like the use of natural dyes and organic materials, aligning traditional methods with contemporary environmental concerns. Museum professionals from Tinos and Ioannina stressed the growing role of cultural tourism, which provides vital economic support while fostering an appreciation for TCs among diverse audiences.

Participants also shared insights into initiatives that have successfully addressed these challenges. Educators at CERFAV described how apprenticeships with industry professionals foster creativity and practical expertise, creating a dynamic exchange of knowledge between generations. Ioannina silversmiths discussed how expanding their market to include ecclesiastical objects for export to Eastern Europe has bolstered the economic resilience of their craft. Museum experts in Tinos and Ioannina highlighted the dual role of museums in preservation and education, serving as platforms for workshops, exhibitions, and public engagement.

The analysis also identified several emerging trends shaping the future of TCs. Craft masters in Limoges and CERFAV spoke of partnerships with contemporary artists and luxury brands, which have expanded their audience and diversified their product offerings. Tapestry makers described how integrating photorealistic and abstract designs into their work has helped TCs appeal to modern consumers, while weavers in Crete described how tourism has contributed to enhancing their income through thematic tours and textile weaving courses. At the same time, they described how the Association of Women Entrepreneurs has organised collective actions to promote textile products, demonstrating the potential of cooperative efforts to strengthen local crafts.

4.2 Common challenges and opportunities

Across these crafts, several common challenges have emerged. A generational gap has resulted in a significant skills deficit as younger individuals opt for modern professions over TCs. **Furthermore,** the high costs associated with maintaining traditional methods often limit growth and sustainability. As a result, many artisans struggle to expand their reach beyond local or regional markets. Despite these challenges, there are numerous opportunities to sustain and revitalise these crafts:

Balancing Authenticity and Modernisation: Craft practitioners are increasingly integrating modern designs, materials, and technologies into traditional practices to appeal to contemporary consumers. For example, Ioannina's silversmiths, for instance, have expanded their markets by exporting ecclesiastical objects to Orthodox communities in Eastern Europe, while the modernisation of the production process made such exports more cost-effective for the craft practitioners.

Institutional Support and Training: Organizations like CERFAV, Ioannina's Traditional Craft Centre, and the Professional School of Fine Arts of Panormos at Tinos provide essential education, skill development, and promotion infrastructure.

Entrepreneurial and Community Initiatives: The Association of Women Entrepreneurs in Crete promotes local textiles through collaborative actions, while tapestry artists in Aubusson are exploring photorealistic and abstract designs to attract diverse markets.

Tourism Integration: Crafts like Margarites pottery and Cretan weaving benefit from blending workshops with cultural tourism, offering educational and immersive experiences for visitors.

4.3 Analysis per case

The case-by-case analysis conducted in this work is based on a multi-method research approach, including interviews with craft masters, educators, and museum professionals; ethnographic fieldwork conducted within craft communities; self-reflective interviews where craft masters reflected on their methods through video recordings of their work; and financial data analysis. The interviews with craft masters and educators provided valuable qualitative insights into how these practitioners navigate challenges, innovate within traditional methods, and contribute to the broader craft ecosystem. Ethnographic fieldwork revealed the intimate connections between artisans and their communities, uncovering local dynamics and the socio-cultural context of each craft. The self-reflective interviews were particularly insightful: craft masters viewed recordings of themselves while working and reflected on their methods, shedding light on their creative processes, skill development, and adaptations to new tools or practices. This method allowed participants to engage in a deeper level of self-awareness and critique, which provided rich insights into the evolving nature of their craft practices. Finally, the financial data collection offered an economic perspective, detailing the sustainability of the crafts and their market integration. This combination of methods allows for a nuanced understanding of how these crafts are adapting to modern pressures while maintaining their cultural roots.

4.3.1 Aubusson Tapestry, France

Aubusson tapestry exemplifies how a historically significant craft can remain relevant in the modern era.

Innovation in Craft: Aubusson weavers collaborate with contemporary artists to produce photorealistic and abstract tapestries, broadening their artistic scope and market appeal. While specific financial figures are not available, the ongoing efforts to innovate and collaborate with contemporary artists suggest a positive trajectory for the relevance and sustainability of Aubusson tapestry in today's cultural landscape.

Institutional Support: The Cité Internationale de la Tapisserie plays a critical role by offering exhibitions, training programs, and digital documentation projects that ensure the preservation of traditional techniques while embracing modern artistic trends. With the addition of modern art and the continuation of excellent craftsmanship, Aubusson tapestries have become globally recognised and their client base diversified. For instance, the Cité has undertaken projects like creating tapestries inspired by the works of Hayao Miyazaki, which underscores the commitment to blending traditional techniques with modern artistic expressions [213].

Global Recognition: These efforts have diversified Aubusson's client base, making it a globally recognised symbol of craftsmanship.

Insights: Aubusson demonstrates the importance of blending artistic innovation with robust institutional backing to ensure sustainability and relevance.

4.3.2 Limoges Porcelain, France

Limoges porcelain showcases how TCs can achieve modern relevance through strategic partnerships and education.

Collaborations: The Limoges School of Fine Arts collaborates with luxury brands and museums, elevating the international status of Limoges porcelain.

Curriculum Development: Advanced design techniques integrated into educational programs foster innovation while maintaining traditional processes.

Market Strategy: Combining fine art and functionality has preserved Limoges porcelain's reputation for elegance and precision.

Insights: This case highlights the potential of strategic branding and education in transforming a heritage craft into a luxury product.

Skill transmission: Educational facilities, such as the Limoges School of Fine Arts, are equipping their future artisans with traditional skills, besides modern entrepreneurial tools.

4.3.3 Silversmithing in Ioannina, Greece

Ioannina's silversmithing tradition has been revitalised through innovative strategies and strong institutional collaborations.

Role of Museums: The Ioannina Museum of Silversmithing serves as both a cultural institution and a community hub, preserving archives, conducting workshops, and engaging with schools.

KEPAVI **'s Contribution:** This multi-functional centre provides workshop spaces for artisans, retail opportunities to promote products, and exhibitions that educate the public and foster interest among younger generations.

Market Expansion: Ioannina's silversmiths have broadened their reach by exporting ecclesiastical objects to Orthodox markets in Eastern Europe.

Insights: Combining preservation, education, and market expansion ensures that this traditional craft remains both culturally and economically significant.

Economically innovative business models: Ioannina's silversmithing workshops, for example, now sell heritage designs from around the world via e-commerce. At the same time, through KEPAVI, silversmiths are selling their products using a cooperative model, allowing them to expand to greater markets.

Skill transmission: Apprenticeships supported by the museum in Ioannina and the KEPAVI foster skill transmission, ensuring the preparedness of young people to carry on these practices. At the same time, intergenerational transmission is still the case in silversmithing, allowing time-persistent family workshops to endure in this changing world.

Innovation Spotlight: Practitioners have transitioned from purely local sales to a **hybrid e-commerce model**, exporting heritage designs and ecclesiastical objects to international Orthodox markets. This shows that digital platforms can preserve cultural narratives while ensuring economic resilience.

4.3.4 Textile Weaving in Crete, Greece

The resilience of textile weaving in Crete reflects the entrepreneurial spirit of local artisans and community initiatives. Through a collection of interviews with members of the Association of Women Entrepreneurs in Crete, we can summarise the findings as follows.

Tourism Integration: Workshops integrated into village tourism, such as in Anogeia, provide visitors with cultural experiences while supporting the sustainability of their craft. Selling woven artefacts as souvenirs of the workshop visit is currently the main source of income. In some cases, weaving traditional textiles for special occasions, such as weddings, is also another source of income.

Economically innovative business models: Mainly combined with tourism activities by combining sightseeing with local gastronomy and visits to local craft workshops. In some cases, this is also combined with traditional shelters, allowing visitors to stay longer at the destination and thus explore more craft activities.

Environmental Practices: Many weavers use organic wool and natural dyes from indigenous plants, thereby reducing their reliance on synthetic chemicals. This is not always the case because there is a lack of local thread factories that can transform the wool from local husbandry into thread. The last factory at Anogia, Crete, closed a couple of decades ago, so currently building on entirely sustainable materials is not possible.

Collaborative Efforts: The Association of Women Entrepreneurs in Crete organises collaborative actions to promote textile products on a broader scale.

Industrialisation: In Crete, the weaving of some traditional patterns for daily use textiles has been industrialised. Traditional looms are used to create authentic products with added commercial value. This resulted in the loss of income from traditional weavers since part of the textiles of the household that were traditionally hand-woven are now produced by industrial methods. The existence of local weaving factories has supported the preservation of traditional motifs, but currently facing pressure due to globalisation.

Insights: Blending tourism, sustainability, and cooperative promotion exemplifies how TCs can adapt to modern demands.

Skill transmission: Transferred between generations from mother or grandmother to the next generation of female children of the family. As the economic and practical value of the craft declines, so does the interest of the modern generation to learn the craft.

4.3.5 Woodcarving in Yecla, Spain

Yecla's woodcarving tradition faces significant challenges but also shows promise through cultural tourism and education.

Cultural Tourism: Growing interest in cultural heritage and rural tourism has brought attention to Yecla's artisanal traditions.

Preservation Efforts: Efforts to compile historical information and integrate new technologies aim to document and teach the craft to younger generations.

Environmental Practices: Woodcarvers in Spain use FSC-certified timber as a means of encouraging responsible forestry.

Insights: While deeply rooted in tradition, Yecla's woodcarving shows the importance of leveraging tourism and education to sustain endangered crafts.

4.3.6 Glassblowing at CERFAV, France

CERFAV exemplifies the role of formal training institutions in sustaining TCs while fostering innovation.

Industry Collaboration: CERFAV students often collaborate with the glass industry, gaining practical experience while studying. Some apprentices simultaneously work in the industry, creating a seamless connection between education and real-world application.

Innovative Techniques: By incorporating 3D modelling and other cutting-edge technologies into its curriculum, CERFAV equips students to innovate while respecting traditional methods. This was the case of our former research at CERFAV, where a museum glass artefact was recreated using modern industrial glass-blowing methods to understand the process of creating the original object, which was not

documented and thus lost. Furthermore, CERFAV was the winner of the National Program for Digitisation and Valorisation of Cultural Content – Grand Est in 2021, thanks to an unprecedented proposal for digitisation and valorisation of intangible CH from glass to blowtorch. CERFAV provides access to the general public and professionals in the arts and crafts to 3D digital content of professional gestures around the job of blowtorch glassblowing. The glassblowing techniques taught at CERFAV are complemented by experimental VR modules.

Adoption of eco-friendly methods: CERFAV is using recycled glass for its workshops and is recycling all the leftovers of the glassmaking process. Furthermore, glass blowers recycle waste glass into new creations, minimise waste, and conserve resources.

Mentorship and Creativity: The interaction between students and established artisans fosters a dynamic environment of mentorship and creativity.

Insights: CERFAV demonstrates how institutional support and industry partnerships can keep TCs alive and thriving.

4.3.7 Pottery in Margarites, Crete, Greece

Margarites's pottery is a testament to the enduring appeal of functional and decorative ceramics rooted in ancient traditions.

Tourist Engagement: Workshops for tourists provide both an additional source of income and an avenue for cultural education.

Modern Adaptations: Some potters have introduced contemporary motifs and forms, appealing to new markets while maintaining traditional techniques.

Adoption of eco-friendly methods: In Margarites, a traditional finishing method using sea rocks to polish the clay objects makes them usable and nonabsorbent without the need to apply toxic glazes. At the same time, potters reuse clay trimmings and broken pieces, creating a closed-loop production system that economises as much as it reduces environmental impact.

Reviving lost techniques: In Margarites, the ancient Minoan Age pottery technique has been revived by combining the extraction of local soil for clay and its burning in wood ovens created with the same technique for thousands of years. This technique gives their product a unique dark raw umber style finishing, and the delicate 0processing of natural clay allows for the creation of extremely thin shells.

Insights: Margarites pottery highlights how innovation and tourism can sustain a craft's economic viability.

4.3.8 Marble Carving in Tinos, Greece

Tinos is a renowned centre for marble carving, where tradition and innovation coexist harmoniously.

Museum's Role: The Tinos Museum of Marble Crafts preserves traditional techniques, offers training, and organises exhibitions showcasing both historical and modern works.

Technological Integration: While traditional methods are still employed for fine detailing, modern machinery like CNC machines expands creative possibilities and production capacity. Mechanical aids such as air-powered chisels are also used to improve efficiency. Hand-finishing objects is used to retain the personal touch of artisanship.

Global Recognition: Marble artists have gained international acclaim, with their sculptures adorning public spaces and private collections worldwide.

Insights: Tinos demonstrates the power of combining heritage preservation with technological advancements to sustain global relevance.

Economically innovative business models: Cooperation of marble carvers on the island of Tinos enables sharing resources and bargaining as a group, economising while extending market access.

Skill transmission: The Marble training school and the local craftspersons support skill transition through apprenticeships. At the same time, intergenerational transmission plays an important role.

> **Innovation Spotlight:** The integration of **CNC machines and air-powered chisels** allows for initial roughing-out of large blocks, while retaining **hand-finishing** to ensure the personal touch of craftsmanship remains. This demonstrates how technology augments productivity without eroding authenticity.

4.4 Findings Overview

The case studies reveal critical pathways for sustaining European crafts, further elaborated in section 5, towards proposing measures for the future of TCs:

- **Strengthening Institutional and Industry Links:** Partnerships between museums, training centres, and industries, as seen in CERFAV and ΚΕΠΑΒΙ, foster skill development and market integration.
- **Promoting Innovation:** Artistic experimentation and modern tools enhance the relevance of TCs.
- **Encouraging Community Action:** Collective efforts, such as Crete's textile cooperatives, amplify visibility and resilience.
- **Expanding Global Markets:** Strategic diversification, as demonstrated by Ioannina's silversmiths, opens new economic opportunities.

By addressing challenges and leveraging opportunities, these crafts showcase how cultural heritage can thrive in a modern context.

Identified Challenge	Strategic Opportunity	Evidence Base

Generational Gap: Skills deficit as youth choose modern professions.	**Modernisation:** Integration of 3D modelling and VR to attract digital-native talent.	CERFAV and Limoges School of Fine Arts.
Market Access: Difficulty reaching global markets beyond local tourism.	**Digital Expansion:** Utilising e-commerce and collaborative business models.	Ioannina Silversmithing and KEPAVI.
Operational Costs: High costs of bespoke production vs mass-produced goods.	**Resource Mutualisation:** Shared workspaces and collective bargaining to reduce overheads.	Tinos Marble Carving and Crete Textile Cooperatives.

5 From Findings to Proposed Measures

The proposed measures by this work, towards the sustainability of TCs, are analysed into three levels of interventions. The first level is the craft level, where innovation in materials, sustainable practices, and economic models can assist in the long-term sustainability of crafts. The second level regards education & training that regards curriculum development, digital integration, and knowledge transfer to enhance the capacity of educating and training new professionals. The third level is, of course, the policy Level where targeted interventions such as funding mechanisms, collaboration, recognition, and standards can support sustainability, preservation, and growth. By carefully studying these three levels of integration, short-term and long-term policy recommendations are provided that could potentially positively affect all three levels of intervention. Our proposed approach is graphically illustrated in Figure 2.
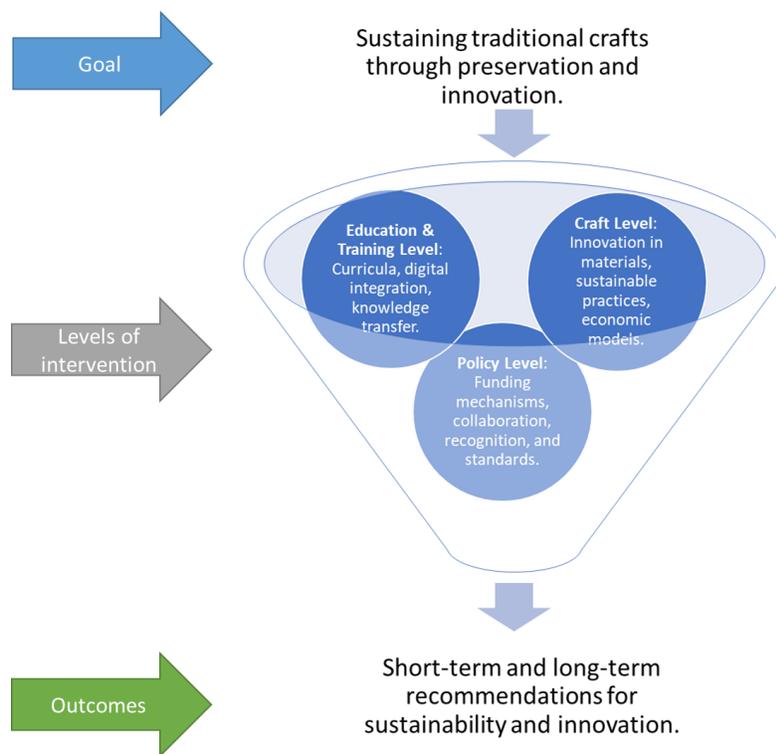
Figure 2: Towards short-term and long-term policy recommendations for sustainability and innovation.

5.1 At the Craft Level

TCs represent not only a legacy of CH but also a field capable of innovation and adaptation to contemporary needs. By exploring innovation in materials and techniques and adopting sustainable practices and economic models, artisans can ensure the longevity and relevance of their crafts. These efforts must balance the authenticity of traditional methods with modern demands and environmental concerns.

5.1.1 Innovation in Materials and Techniques

The integration of new materials and techniques offers a promising pathway for the evolution of crafts while preserving their cultural essence. Traditional materials, though cherished, sometimes come with their problems, such as scarcity, environmental impact, or cost. The adoption of sustainable alternatives like biodegradable materials, recycled components, or advanced composites addresses these issues. For example, ceramic artists are working with more eco-friendly glazes to reduce toxicity in the firing process, while silversmiths are looking into working with recycled silver and other alloys to reduce reliance on raw mining processes.

The adoption of new methods, tools, and technologies is reshaping craft practices. Modern electric or air-powered tools, robotic equipment, digital fabrication technologies, 3D printing, and laser cutting are becoming integral to production processes. In some cases, advanced technologies have even enabled the revival of lost techniques. New methods may also relate directly to the craft itself rather than merely modernising production, such as innovative glazing techniques that render ceramic objects usable without applying traditional glazing materials.

Emerging digital technologies, including 3D modelling and virtual reality (VR), are playing a transformative role in the transmission and innovation of traditional crafts [62]. These technologies allow artisans and learners to visualise, simulate, and refine complex craft processes without material waste [45]. 3D modelling software enables the accurate preservation of traditional design patterns, which can then be digitally archived or modified for contemporary applications [69]. VR platforms offer immersive environments where trainees can interact with virtual representations of traditional tools and techniques, gaining hands-on experience in a risk-free setting [62].

Such innovations are further enhanced through collaborations between artisans and researchers. For example, nanotechnology applications in woodcraft and pottery enhance durability without compromising aesthetic qualities. Augmented reality (AR) platforms have provided artisans with new ways to visualise, create, and perfect designs before actual execution. These advancements not only support the preservation of craft knowledge but also encourage novel interpretations and creative innovation, ensuring the continued relevance of traditional craftsmanship in modern contexts.

5.1.2 Sustainable Practices and Economic Models

The adoption of sustainable practices puts TCs in step with the growing global emphasis on environmental responsibility. Sustainable management of resources has become paramount, as most artisans are seeking out eco-friendly materials. In tandem, circular economy principles are making their mark. Eco-certifications give added value to sustainable crafts, with labels such as Fair Trade or regional sustainability marks allowing the product to differentiate in the market and appeal to the eco-conscious consumer.

Economically, innovative models are helping artisans achieve financial viability. Digital platforms provide artisans with access to world markets; Cultural tourism brings in supplemental income, with evidence in the form of craft workshops and festivals that draw visitors and elevate local economies.

The creation of artisan clusters and the mutualisation of workspaces represent an innovative strategic approach to supporting traditional European crafts. By bringing craftsmen together in shared spaces, these schemes not only significantly reduce individual operating costs but also foster the emergence of an enriching collective dynamic. These craft hubs can integrate workshops equipped with traditional tools and modern technologies, exhibition spaces, and areas dedicated to training and the transmission of

---

know-how. This configuration enables craftspeople to benefit from infrastructures they would not necessarily be able to afford individually while creating an environment conducive to knowledge exchange and collaborative innovation.

However, achieving full circularity is often hindered by fragmented supply chains. For instance, the closure of the last thread factory in Anogia, Crete, has left local weavers unable to source processed wool from local husbandry despite the availability of raw materials. Policy measures must therefore go beyond supporting the "final craft" and extend to Micro-Infrastructure Re-industrialisation, ensuring that the foundational raw-material supply chain is revitalised to meet the goals of the European Green Deal.

5.2 At the Education and Training Level

Museums, craft guilds, training schools, universities, and intergenerational knowledge transmission are important in sustaining crafts over time. Education and training are important for ensuring the continuity of TCs, especially as these practices face the dual pressures of modernisation and globalisation. By addressing the twin goals of preserving traditional skills and integrating contemporary tools and methodologies, education serves as a bridge between the past and the future, creating pathways for sustained craft practices.

5.2.1 Curriculum Development and Skill Preservation

The development of TCs-oriented curricula will be vital for their survival. These curricula must focus on the documentation and transmission of time-honoured techniques and hands-on training as well as theoretical instruction in priority.

The preservation of skills needs to be informed by an understanding of local traditions and the cultural contexts in which they evolved. Curriculum development in such contexts involves not only teaching technical weaving skills but also fostering an appreciation for the cultural narratives embedded in each craft. This approach ensures that artisans are not merely technicians but also custodians of their CH.

Besides, curricula will have to meet the realities of modern education. Short-term workshops, online courses, and blended learning approaches give flexibility to training that may be accessed by very diverse learners. This diversity is necessary to attract young people and professionals from outside the crafts sector who may also want to incorporate traditional skills into new contexts such as sustainable fashion or heritage tourism.

5.2.2 Integrating Digital Tools and Resources

The integration of digital tools into craft education, such as 3D modelling, VR, and AR, has the potential to offer new ways to teach and preserve crafts. Of growing importance in education are also digital repositories and online platforms that provide access to ethnographic videos, 3D scans of artefacts, and step-by-step tutorials. Several platforms have made craft knowledge accessible to a worldwide audience, while initiatives such as Europeana have contributed to the partial digitisation of craft heritage into a shared resource to be used by students, educators, and researchers alike. Such tools support not only formal education but also self-directed learning in TCs.

Digital learning tools, like gamified applications and AR guides, are some of the engaging methods for teaching crafts to younger audiences. For instance, a digital application developed for marble carving in Tinos allows users to explore carving techniques virtually, thus making learning accessible and enjoyable. Digital storytelling, where artisans share their journeys and expertise through multimedia platforms, further enriches educational experiences by humanising the craft and its practitioners.

Lastly, partnerships between educational institutions and technology companies can also facilitate the development of specialised digital tools for specific crafts. Such partnerships ensure that digital inclusions are not only technologically advanced but also culturally and contextually sensitive. In so doing, education systems will create a strong infrastructure to support both the preservation and advancement of TCs by embracing these digital innovations.

6 Policy recommendations

Craeft demonstrates that traditional crafts can be sustained and revitalised when cultural heritage policies, digital innovation, education, and sustainability agendas are addressed in an integrated manner. In this section, we are providing policy recommendations by aligning the results of our findings presented in section 4 and the measures that we propose in section 5. The rationale of this alignment is the following. At the first level, we propose the inclusion of TCs into existing funding and collaboration opportunities. At a second level, we propose building strong bases for the future by investing in training on TCs and capacity building to support the sustainability of the craft sector. Last but not least, taking into account that a significant percentage of the craft sector is strongly bound to cultural tourism, we propose measures towards supporting and enhancing cultural tourism in Europe.

It is important to note that the role of European policy in safeguarding and reviving TCs is important, by supporting and enhancing existing best practice examples and providing the framework and resources necessary to address challenges and foster opportunities. By offering funding, creating incentives, and facilitating cross-border collaboration, European policies ensure that crafts remain integral to CH and economic development.

6.1 Support traditional crafts through existing funding and collaboration opportunities

6.1.1 Funding and Incentives

The financing mechanisms are at the core of European support for TCs, and a multitude of programs exist to address financing barriers and encourage innovation. Probably one of the flagship programs in this regard is Creative Europe, which provides grants for projects that safeguard CH, contribute to the creative industries, and encourage innovation in TCs. It helps craft organisations and craftsmen in the development of new products, digitalisation, and better market access.

To ensure the long-term sustainability of traditional crafts, funding must be targeted at three distinct governance levels:

- **EU Level:** Explicitly include traditional crafts in Creative Europe and Horizon Europe calls, specifically rewarding projects that bridge the gap between "born-digital" tools and intangible heritage.
- **National Level:** Implement fiscal incentives, such as VAT reductions or tax credits, for artisans who adopt eco-certified materials or participate in formal apprenticeship certification.
- **Regional Level:** Deploy ERDF micro-grants (€5k–€25k) to support small workshops in adopting e-commerce infrastructure or energy-efficient machinery.

Also important are the substantial contributions through the European Regional Development Fund and the European Social Fund, which invest in the development of small and medium-sized enterprises in the craft sector. Through these, the artisans modernise their ateliers, which invest in sustainable materials and help them access the international market. Specific national schemes in countries such as Greece,

France, and Spain, through EU funding, underpin subsidies of training programs, enhancing local infrastructures related to crafts.

Incentives for Artisans: The use of sustainable practices and digital technologies is encouraged by incentives tailored for artisans. Tax breaks and grants for green initiatives, like using eco-friendly materials or reducing energy consumption, would be in line with the objectives of the European Green Deal. Similarly, programs like Horizon Europe facilitate research and innovation, enabling craftspeople to explore new techniques and materials that integrate traditional skills with modern advancements.

Expanding funding opportunities: Future policy efforts could consider expanding the scope of funding to include micro-grants tailored specifically for small, independent artisans who lack access to larger funding schemes. These grants could support early-stage innovation, participation in trade fairs, or joining collaborative networks.

Policy objective: To ensure the long-term sustainability, innovation capacity, and socio-economic relevance of traditional crafts by embedding them systematically within EU cultural, innovation, cohesion, and sustainability policies.

Relevant EU policy frameworks

- Creative Europe Programme (2021–2027)
- Horizon Europe (Clusters 2 "Culture, Creativity and Inclusive Society" and 4 "Digital, Industry and Space")
- European Regional Development Fund (ERDF) and European Social Fund Plus (ESF+)
- EU Industrial Strategy (SME pillar)
- European Green Deal and Circular Economy Action Plan
- New European Bauhaus initiative

Actionable recommendations

1. Mainstream traditional crafts within Creative Europe and cultural funding schemes. The European Commission should ensure that traditional crafts and intangible cultural heritage are explicitly recognised within Creative Europe priorities, including through:
   o Dedicated call topics or sub-priorities addressing craft preservation, digitisation, and innovation.
   o Evaluation criteria that reward projects combining traditional knowledge with digital tools, education, and sustainability, as demonstrated by Craeft pilots.
2. Enable micro-scale funding tailored to individual artisans and micro-enterprises Member States and Managing Authorities are encouraged to deploy micro-grant schemes (€5,000–€25,000) under ERDF and ESF+ to support:
   o adoption of digital tools (e.g. documentation, e-commerce, AR/VR for training);
   o transition to sustainable and circular production practices;
   o participation in European networks, fairs, and cross-border collaborations. These instruments are particularly critical for small, independent artisans who cannot access large-scale EU funding.
3. Integrate traditional crafts into Horizon Europe innovation ecosystems. Traditional crafts should be explicitly included in applied research and innovation actions, especially within:

- o Living Labs and innovation hubs;
- o SSH–Technology interdisciplinary projects;
- o research on digitisation of tacit knowledge, immersive learning, and sustainable materials. Craeft provides evidence that craft-based innovation can contribute meaningfully to EU research objectives when appropriately framed.
4. Introduce fiscal and regulatory incentives aligned with the European Green Deal. National and regional authorities should introduce or expand:
   - o tax incentives and subsidies for the use of eco-certified materials and low-impact production methods;
   - o financial support for energy-efficient workshops and resource optimisation technologies. These measures align traditional crafts with EU climate and sustainability objectives while reinforcing their competitiveness.

6.1.2 Cross-border Collaboration and Recognition

European policy also fosters cross-border collaboration, recognising that CH transcends national boundaries. Initiatives like the European Heritage Label and UNESCO's Intangible CH program highlight crafts with significant cultural value, promoting international awareness and cooperation. These designations not only celebrate crafts but also encourage shared strategies for their preservation and promotion.

The Erasmus+ program plays a critical role in enabling mobility and knowledge exchange among artisans, educators, and researchers. For example, partnerships between craft schools in Limoges, Ioannina, and CERFAV have facilitated the exchange of best practices, the development of joint training modules, and collaborative innovation projects.

Policy frameworks also emphasise the harmonisation of standards, particularly for certifying and labelling artisanal products. The Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG) labels ensure that TCs maintain their authenticity while gaining recognition in broader markets. These labels enhance consumer trust and provide economic benefits by positioning crafts as premium goods.

Strengthening Collaboration Networks: To bolster collaboration, the European Union promotes regional and thematic networks such as the European Network of TCs and ECHY (European CH Year) initiatives. These platforms connect stakeholders, fostering dialogue and facilitating the sharing of technological, educational, and policy-related resources.

Developing Craft Incubators: As an additional recommendation, the creation of craft-specific incubators across Europe could provide emerging artisans with access to shared tools, mentorship, and market insights. These incubators could serve as hubs for innovation and training, combining traditional skills with advanced manufacturing techniques and sustainable practices.

6.2 Invest in training and capacity building

Training plays a pivotal role in preserving TCs, ensuring that skills are passed on to future generations. Policies should emphasise integrating crafts into formal and informal education systems, promoting their cultural and economic value.

Vocational Education and Training programs: Establishing specialised VET programs that blend traditional techniques with modern technology can attract younger generations. For instance, programs could include modules on digital marketing, e-commerce, and sustainable production practices, equipping artisans with tools to thrive in contemporary markets.

Public awareness campaigns: Raising awareness of the cultural significance of TCs through public campaigns can increase interest and participation. Policies could support initiatives such as exhibitions, documentaries, and digital storytelling platforms that showcase the stories and skills of artisans.

Integrating technology into TCs provides an opportunity to enhance productivity, improve quality, and expand market access while respecting the authenticity of the craft. Creating and supporting digital platforms where artisans can showcase and sell their work directly to consumers can help them reach a global audience. These platforms can include virtual tours of workshops, detailed product narratives, and customisation options.

Policy objective: To secure intergenerational knowledge transfer and modernise craft education by embedding traditional crafts within European skills, vocational training, and digital education policies.

6.2.1 Relevant EU policy frameworks

- European Skills Agenda
- Pact for Skills
- Erasmus+ Programme
- Council Recommendation on Vocational Education and Training (VET)
- Digital Education Action Plan (2021–2027)

6.2.2 Actionable recommendations

1. Modernise VET pathways for traditional crafts. Member States should develop or update VET curricula that combine:
   o traditional craft techniques;
   o digital competences (e.g. digital documentation, design tools, online marketing);
   o sustainability and circular economy principles.
   o Such hybrid profiles respond directly to labour market needs while preserving cultural authenticity.
2. Support blended and immersive apprenticeship models. Based on Craeft results, the EU and Member States should promote apprenticeship models that integrate:
   o physical, workshop-based learning;

- o digital and immersive tools (AR/VR, virtual demonstrations, digital repositories). Erasmus+ can be leveraged to support transnational mobility, joint curricula, and peer learning among craft schools, museums, and training centres.
3. Invest in train-the-trainer and master artisan programmes. Dedicated funding should support master artisans and educators in acquiring:
    - o pedagogical skills;
    - o digital competences;
    - o capacity to use immersive and online tools for knowledge transmission. This is essential to ensure the sustainability of training initiatives beyond pilot phases.
4. Increase public awareness and attractiveness of craft careers. EU and national policies should support communication and awareness actions that position traditional crafts as:
    - o viable professional pathways;
    - o contributors to innovation, sustainability, and local development.

6.3 Supporting Cultural Tourism

Cultural tourism, which emphasises the exploration and appreciation of TCs and heritage, can significantly contribute to both the preservation and revitalisation of TCs. European policies could focus on several key recommendations to enhance cultural tourism while ensuring the sustainability of TCs.

Developing specialized craft tourism routes: To promote cultural tourism, it can be encouraged the development of dedicated craft tourism routes that highlight regions known for their artisanal heritage can be encouraged. By creating thematic itineraries that connect various craft hubs across Europe, tourists would have the opportunity to engage with crafts in an immersive and meaningful way.

Supporting cultural festivals and events: Cultural events such as craft fairs, festivals, and artisan workshops have a significant role in both promoting TCs and attracting tourists. The EU could provide funding and logistical support for these events through programs like the European Regional Development Fund and the Creative Europe program.

Policy objective: To leverage cultural tourism as a driver for craft preservation, regional development, and community resilience, while safeguarding authenticity and sustainability.

6.3.1 Relevant EU policy frameworks

- EU Tourism Transition Pathway
- Smart Specialisation Strategies (S3)
- European Capitals of Culture and cultural routes initiatives
- ERDF regional development instruments

6.3.2 Actionable recommendations

1. Develop and support craft-based cultural tourism routes. Regional and national authorities should integrate traditional crafts into tourism strategies by:
    - o creating thematic craft routes and itineraries;

o supporting living workshops, demonstrations, and visitor participation. These actions enhance visitor experience while generating direct income for artisans.
2. Link cultural tourism funding to authenticity and sustainability criteria. EU and national funding for festivals, fairs, and craft-related events should prioritise:
   o authentic, place-based craft practices;
   o environmentally responsible production;
   o fair remuneration of artisans.
3. Strengthen synergies between tourism, museums, and craft communities. Cultural institutions should be supported in acting as intermediaries between artisans and visitors, facilitating:
   o short-term workshops and apprenticeships;
   o educational tourism experiences;
   o dissemination of craft narratives and skills.

6.4 From Pilot Projects to Policy Uptake and Scale-Up

Policy objective: To ensure that successful pilot initiatives, such as those developed within Craeft, lead to structural and long-term policy impact.

6.4.1. Actionable recommendations

1. Use Craeft pilots as reference models for policy replication. European and national authorities should recognise Craeft outcomes as:
   o evidence-based models for integrating technology into craft education;
   o transferable approaches for combining heritage preservation with innovation. These models should inform future calls and national strategies.
2. Encourage replication through cohesion and education funding. Member States are encouraged to replicate and adapt Craeft-like pilots using:
   o ERDF and ESF+ for regional deployment;
   o Erasmus+ for educational scaling and cross-border cooperation.
3. Establish monitoring and evaluation frameworks for craft innovation policies. Policymakers should require both qualitative and quantitative indicators assessing:
   o skill transmission and learner engagement;
   o economic viability and market access;
   o sustainability and environmental impact.

Evaluation results should directly inform policy refinement and long-term investment decisions.

6.4 Short-term versus long-term measures

The proposed policy measures are consistent with the strategic priorities articulated within the European-level debate on craft revitalisation, including the framework developed under the CRAFTOUR initiative. In particular, they reflect the need to strengthen the understanding and valorisation of traditional crafts, safeguard authenticity, reinforce transmission and certification systems, enhance economic sustainability, and improve documentation and archiving mechanisms.

A phased approach is required to ensure both immediate stabilisation and long-term structural integration of the craft sector within European policy frameworks.

6.4.1 Short-Term Policy Recommendations (0-2 years)

In the short term, interventions should focus on stabilising vulnerable craft ecosystems while enhancing their visibility and policy recognition. In line with CRAFTOUR's emphasis on valorisation and sector understanding, simplified access to European funding instruments, e.g. Creative Europe and Erasmus+, would enable small-scale enterprises and training bodies to respond rapidly to economic and generational pressures. Administrative simplification and targeted micro-grant schemes can be particularly effective in addressing immediate needs.

Given the urgency of knowledge transmission gaps identified across Member States, accelerated apprenticeship schemes and mentorship initiatives should be prioritised. Such measures directly respond to CRAFTOUR's pillar on transmission, training, and certification, ensuring that tacit knowledge is not lost due to demographic shifts within the sector.

Short-term actions should also strengthen safeguards for authenticity and provenance. Transparent certification systems, labelling mechanisms, and improved consumer information frameworks can prevent misappropriation and unregulated commodification. These safeguards are essential not only for market integrity but also for preserving the cultural meaning embedded in craft practices.

In parallel, rapid support for digital capacity-building can expand access to markets while reinforcing documentation efforts. Training in digital literacy, e-commerce, and intellectual property protection should be accompanied by early-stage initiatives for structured documentation of techniques and processes. This approach reflects CRAFTOUR's recognition that documentation and archiving are foundational components of resilience rather than secondary add-ons.

Finally, immediate alignment with sustainability objectives under the European Green Deal should be encouraged through advisory services and pilot initiatives supporting responsible sourcing and circular production models.

More specifically, short-term measures should aim to stabilise vulnerable craft ecosystems, address urgent skills gaps, enhance visibility, and facilitate rapid access to funding and markets.

1. Immediate Funding and Incentives

- Simplify and fast-track access for artisans and small craft organisations to existing EU funding instruments (e.g., Creative Europe, Erasmus+, cohesion funds).
- Establish targeted micro-grants for digital adoption, sustainable material experimentation, and workshop modernisation.
- Provide temporary tax relief or social contribution reductions for small-scale craft enterprises in vulnerable regions.

2. Accelerated Access to Digital Markets

- Support the development or strengthening of certified digital platforms promoting direct artisan-to-consumer sales.
- Provide training in digital marketing, e-commerce, intellectual property protection, and storytelling.
- Encourage the integration of provenance mechanisms and certification schemes to safeguard authenticity and cultural context.

3. Rapid Deployment of Craft-Based Cultural Tourism Actions

- Integrate traditional crafts into regional and national tourism strategies.
- Support open workshops, craft routes, festivals, and museum collaborations.
- Develop joint promotional campaigns linking crafts with gastronomy, landscape, and local heritage assets.

4. Short-Cycle Skill-Transfer and Apprenticeship Schemes

- Fund intensive apprenticeship programmes (3–12 months) to address urgent generational gaps.
- Support mobility schemes for young artisans across Member States.
- Encourage intergenerational mentorship initiatives through local chambers and cultural institutions.

5. Fast-Tracking Eco-Certifications and Sustainability Labels

- Facilitate access to environmental certification schemes tailored to small craft enterprises.
- Promote pilot projects aligned with circular economy objectives under the European Green Deal.
- Provide advisory services on responsible sourcing, waste reduction, and sustainable production methods.

6.4.2 Long-Term Policy Recommendations (3-5 years)

While short-term measures address stabilisation, long-term policy must focus on structural integration and systemic recognition of traditional crafts within European governance frameworks. Consistent with the CRAFTOUR vision, traditional crafts should be embedded more firmly within national and European Vocational Education and Training systems. Hybrid curricula combining manual expertise, digital competence, sustainability literacy, and entrepreneurial skills can strengthen long-term viability. Cross-border cooperation under Erasmus+ partnerships would further enhance exchange and harmonisation of training standards.

Long-term resilience also depends on improved statistical recognition and data harmonisation across Member States. The development of clearer classification systems and sectoral mapping tools would enhance evidence-based policymaking and respond directly to CRAFTOUR's call for strengthened understanding and measurement of the craft ecosystem.

Documentation and archiving should be institutionalised through shared European infrastructures capable of preserving techniques, processes, and tacit knowledge in structured digital formats. Such

infrastructures may be supported through research and innovation programmes, including Horizon Europe, ensuring that technological integration complements rather than replaces manual craftsmanship.

Sustainability objectives must likewise be embedded structurally within craft policy. Incentives for renewable materials, circular production systems, and low-impact practices should move beyond pilot schemes and become integral to long-term regulatory and funding frameworks.

Finally, greater harmonisation of authenticity safeguards and quality assurance mechanisms at the European level would strengthen cross-border recognition and consumer trust. Clearer geographical indication systems and provenance standards would protect cultural integrity while enhancing economic competitiveness.

More specifically, Long-term measures aim to structurally embed traditional crafts into European innovation, sustainability, education, and cultural policy frameworks.

1. Structural Investment in Education and Training Systems

- Integrate traditional crafts into formal Vocational Education and Training (VET) pathways across Member States.
- Develop hybrid curricula combining hands-on practice with digital competences.
- Promote European-level cooperation in craft education through Erasmus+ partnerships.
- Support advanced academic programmes linking design, heritage, and digital innovation.

2. Long-Term Digital Integration in Education, Production, and Preservation

- Invest in digital documentation infrastructures (3D scanning, immersive environments, craft archives).
- Develop shared European digital repositories of craft techniques and tacit knowledge.
- Encourage responsible integration of emerging technologies while preserving manual expertise.

3. Embedding Sustainable Resource Management in Craft Practices

- Align craft production models with circular economy strategies.
- Incentivise the use of renewable materials and low-impact processes.
- Promote research collaborations under Horizon Europe exploring sustainable craft innovation.

4. Harmonisation and Strengthening of Craft Certification Systems

- Develop EU-level frameworks for craft authenticity, geographical indication, and quality assurance.
- Enhance transparency in digital marketplaces through provenance tracking.
- Strengthen recognition of intangible cultural heritage elements within EU policy instruments.

5. Establishment of Regional and Thematic Craft Hubs

- Create regional craft innovation hubs linking artisans, designers, researchers, and educators.
- Encourage shared equipment facilities and cooperative production models.

- Support cluster development strategies integrating crafts into smart specialisation agendas.

6. Deepening Cross-Border and Interdisciplinary Collaboration

- Foster transnational networks connecting traditional crafts with creative industries, cultural institutions, and sustainability initiatives.
- Promote participation of craft actors in European Capitals of Culture and related programmes.
- Encourage knowledge exchange between rural and urban craft ecosystems.

7. Mainstreaming Crafts within Broader EU Policy Agendas

- Embed traditional crafts into cultural, innovation, social cohesion, and sustainability strategies coordinated by the European Commission.
- Ensure alignment with the European Green Deal, digital transformation strategies, and regional development policies.
- Recognise traditional crafts as contributors not only to heritage preservation but also to economic resilience, green transition, and social cohesion.

Funding mutualisation schemes: The financing of these mutualisation schemes could be based on a combination of public and private sources, as part of territorial development and CH preservation policies. European funds, notably through the Creative Europe and FEDER programs, could be mobilised to support the acquisition and development of spaces, while local authorities could contribute by making buildings available or granting tax breaks. A hybrid economic model, including the participation of artisans in the form of contributions adapted to their income, income generated by tourism and educational activities, and support from private sponsors, would ensure the sustainability of these structures. This collective approach would also give craftspeople greater visibility and strengthen their ability to respond to contemporary challenges while preserving the authenticity of their practices.

6.4.3 Integrated Policy Outlook

These measures collectively operationalise European priorities concerning valorisation, safeguarding, transmission, economic sustainability and documentation and reflect the priorities identified within the CRAFTOUR framework. They move beyond short-term preservation towards a systemic repositioning of traditional crafts as contributors to sustainability transitions, regional resilience, and inclusive economic development.

By integrating valorisation, safeguarding, transmission, documentation, and economic innovation within a coherent European approach, traditional crafts can transition from vulnerable heritage sectors to structurally supported components of Europe's cultural and socio-economic landscape.

Short-term measures provide necessary stabilisation and immediate support for artisans and local ecosystems. However, without long-term structural integration into education systems, sustainability frameworks, digital infrastructures, and EU-wide policy strategies, such measures risk remaining fragmented and temporary.

A coherent European approach must therefore combine rapid intervention with structural transformation. By synchronising funding instruments, education reforms, digital innovation, and

sustainability objectives, traditional crafts can evolve from vulnerable heritage sectors into dynamic contributors to Europe's cultural vitality, regional resilience, and green transition.

7. Discussion & conclusions

The findings of this study emphasise the relationship between traditional crafts (TCs), evolving technology, new societal needs, and policy frameworks. The discussion integrates relevant theoretical frameworks to deepen the academic contribution and provides comparative regional insights for broader international applicability.

7.1 Implications for Artisans and Communities

The sustainability of TCs is closely tied to the social and economic well-being of artisans and their communities. Individual artisans face the dual pressures of preserving tradition while adapting to a globalised market. This underscores the necessity of adopting modern technologies, such as 3D scanning, e-commerce platforms, and virtual demonstrations, to expand market access and preserve skills. However, these advancements come with challenges, including the need for technical training and financial investment.

7.2 Theoretical Integration

The theoretical frameworks that inform this study include key perspectives on cultural heritage, innovation, and sustainability. Bourdieu's concept of cultural capital underscores the value of traditional crafts as vital forms of identity and community cohesion, highlighting the importance of intergenerational knowledge transmission [214]. Rogers' diffusion of innovations theory provides insights into how artisans can overcome barriers in adopting new technologies [215]. The creative economy framework, as articulated by Florida, situates TCs within regional innovation clusters that attract cultural tourism [216]. Sustainability frameworks, such as the triple bottom line [217] and the UN SDGs emphasise how TCs align with responsible production, environmental sustainability, and social well-being. Additionally, place attachment and community resilience theories underscore how craft practices reinforce local identity and resilience against socio-economic disruptions [218].

At the community level, the decline of TCs often results in a loss of cultural identity and local pride. Conversely, revitalising crafts can strengthen communities, enhance tourism, and foster a sense of place. To thrive, artisans require robust community-based support systems, including training facilities, cooperative structures, and local investments. Engaging younger generations is particularly crucial. While crafts rely on historical methods and aesthetics, they must also adapt to remain relevant in modern contexts. A careful approach is needed to use technology as an enhancement rather than a replacement. Sustainable practices also demonstrate how tradition and innovation can align.

7.3 Comparative Analysis

In Japan, traditional crafts are protected as "Intangible Cultural Properties," with strong state support for training and market development. South Korea's National Intangible Heritage Centre and China's initiatives to integrate crafts into global markets provide models for structured preservation and commercialisation. The decentralised policy approach in the U.S., where nonprofit organisations like the American Craft Council support crafts, contrasts with European models. Canada's emphasis on Indigenous

craft preservation highlights the importance of inclusive cultural policies. Peru and Ghana provide examples of integrating crafts into sustainable tourism initiatives and global trade frameworks, emphasising local craftsmanship's cultural and economic value.

7.4 Aligning Policies with Broader Sustainability Goals

European policies on cultural heritage (CH) must align with global sustainability goals, such as the United Nations' Sustainable Development Goals (SDGs). Craft practices intersect with goals related to decent work (Goal 8), sustainable communities (Goal 11), and responsible production (Goal 12). Policymakers can support TCs by incentivising sustainable materials and practices, providing funding mechanisms that reduce carbon footprints, and promoting renewable materials. Aligning craft policies with the European Green Deal ensures that TCs contribute to environmental sustainability while preserving CH.

Sustainable practices should be incentivised to encourage the use of eco-friendly materials and techniques in TCs. Establishing consistent standards for recognising artisanal quality, as seen with the Protected Geographical Indication (PGI) labels, can harmonise efforts across Europe. Inclusive policy design, where artisans actively participate in policy formulation, is essential for bridging legislative frameworks with the practical needs of the craft sector.

7.5 Key Insights

Digital tools, such as 3D scanning and virtual reality, hold transformative potential in documentation, education, and market expansion for TCs. These technologies enable artisans to preserve intricate craft processes while reaching global audiences. Sustainability efforts, including the adoption of eco-friendly materials and circular economic models, are vital for ensuring the longevity of crafts. Policy frameworks and funding mechanisms must align with grassroots needs to effectively support TCs. Additionally, cross-border collaborations, recognition programs, and training initiatives offer valuable pathways for empowering traditional craft sectors and fostering innovation.

7.6 Key Recommendations

Artisans should adopt digital technologies to preserve skills, engage younger generations, and reach global audiences. They should also forge partnerships with educational institutions and museums to support skill transmission and innovation. Furthermore, community-driven initiatives, such as cooperative models, can amplify artisans' visibility and market access, helping them thrive in evolving markets.

Educational institutions should develop curricula that integrate traditional techniques with modern tools to better prepare students for contemporary challenges. The expansion of virtual and AR applications can bridge geographical and generational gaps in knowledge sharing. Successful programs, like CERFAV and the Limoges School of Fine Arts, exemplify how balancing technical rigour with artistic creativity fosters innovation.

Policymakers must integrate TCs into broader cultural and economic sustainability agendas. Increasing funding for research, training, and market development is vital. Promoting cross-border collaborations and establishing enhanced recognition mechanisms, such as certifications and quality labels, will further

empower TCs. Craft-focused initiatives that address both legislative and grassroots needs will help sustain and elevate traditional crafts.

Strategic Roadmap to 2030

- **Phase 1: Stabilisation (Years 0–2):** Focus on fast-tracking micro-grants for digital adoption and creating regional "Living Workshop" tourism routes to provide immediate income for artisans.
- **Phase 2: Integration (Years 3–5):** Embed hybrid curricula (manual + digital) into national VET systems and institutionalise shared European digital repositories for tacit knowledge.
- **Phase 3: Resilient Prosperity (Years 5+):** Establish a unified European quality label (PGI) for artisanal goods and full integration of craft clusters within Smart Specialisation Strategies.

7.7 Future Directions for Research

Future research should explore the long-term impact of digitisation on craft preservation, authenticity, and market dynamics. Investigating how digital technologies can create inclusive training and collaboration platforms is vital. Additionally, developing economic models that emphasise sustainability and circularity tailored to TCs can provide new pathways for artisans to thrive while minimising environmental impact. Comparative studies across regions can identify best practices for funding, training, and cultural promotion. Evaluating the efficacy of existing European and international policies on TCs can inform the co-definition of future strategies. Finally, interdisciplinary studies connecting TCs with tourism, urban development, and contemporary design could highlight innovative applications of craft heritage in modern contexts, ensuring that TCs continue to evolve and contribute meaningfully to Europe's culture and economy.

8. Ethical Considerations

Ethical considerations were taken into consideration throughout the research process. All participants gave informed consent, and their anonymity and confidentiality were respected. This research also followed European Union data protection regulations, the GDPR, in data collection, storage, and usage. The study aimed to be transparent in reporting the findings and to have the interests and contributions of artisans and other stakeholders correctly represented.

Annex A. Craft Master interview

Part 1: Background and Career Trajectory

Q1.1. Can you tell me about your journey into this craft? Do you recall the moment you thought of being involved in your craft?

Q1.2. What are some key turning points in your career as a craftsperson?

Q1.3. How has your background (e.g., family, community, education) influenced your career in this craft?

Q1.4. What role did mentors or senior practitioners play in your learning and growth?

Part 2: Evolution of Craft Practices

Q2.1. How have your craft practices evolved over the years?

Q2.2. Have you introduced any innovations or new techniques into your work? If so, what motivated these changes?

Q2.3. Can you describe how historical, cultural, or economic events have impacted your craft?

Q2.4. How do you balance preserving traditional methods with adapting to modern trends or demands?

Part 3: Integration of Digital Technologies

Q3.1. What role, if any, do digital technologies play in your craft practices?

Q3.2. Are there specific tools or platforms that have significantly changed how you work or reach your audience?

Q3.3. What are the benefits and challenges of integrating technology into your craft?

Q3.4. How do you see the future of your craft evolving with advancements in technology?

Part 4: Education and Skill Transmission

Q4.1. How did you acquire the knowledge and skills necessary for your craft?

Q4.2. What is your approach to teaching or passing on your craft to others?

Q4.3. Do you believe formal education and training programs help preserve traditional crafts? Why or why not?

Q4.4. What changes would you recommend to improve education and training for future generations of craftspeople?

Part 5: Challenges and Opportunities

Q5.1. What are the biggest challenges you face as a craftsperson today?

Q5.2. Are there any specific opportunities or trends that you think could benefit your craft?

Q5.3. How has the market for your craft changed over time?

Q5.4. What are your expectations at a regional, national, and European level concerning policy and legislation?

Part 6: Broader Life and Social Dynamics

Q6.1. How do you feel your craft has shaped your identity or personal development?

Q6.2. How has your craft practice influenced your relationships with your community or society at large?

Q6.3. Can you describe how your craft has been impacted by life events, such as family changes, relocations, or significant societal shifts?

Part 7: Closing Questions

Q7.1. Looking back, what advice would you give to someone starting in your craft?

Q7.2. What do you hope will be the legacy of your craft practice?

Annex B. Craft Student/Apprentice interview

Part 1: Background and Career Decision

Q1.1. What inspired you to pursue this craft, and how did you get started?

Q1.2. Did your family, community, or cultural traditions influence your decision to learn this craft?

Part 2: Learning Experience and Work-Study Balance

Q2.1. Are you currently working while studying this craft? If so, how do you balance your work and studies?

Q2.2. How has working in a craft-related setting (e.g., a factory, workshop, or studio) influenced your learning experience?

Q2.3. What skills or knowledge have you gained through hands-on work that you feel complement your formal education?

Part 3: Aspirations and Challenges

Q3.1. What are your goals for the future in this craft?

Q3.2. What challenges have you faced as a student or apprentice, especially if you are also working?

Q3.3. How do you see your craft evolving in the future, and what role do you want to play in that evolution?

Part 4: Integration of Modern Technology

Q4.1. Are you using modern tools or digital technologies in your studies or work? How have they impacted your approach to the craft?

Q4.2. How do you feel about combining traditional methods with modern innovations?

Part 5: Reflections and Insights

Q5.1. How has learning this craft shaped your identity or outlook on life?

Q5.2. What advice would you give to someone considering studying this craft, especially if they plan to work and study simultaneously?

Annex C. Craft Educator interview

Part 1: Background and Role as an Educator

Q1.1. What inspired you to become a craft educator, and how did you transition from practitioner to teacher?

Q1.2. How has your experience as a craftsperson influenced your teaching methods?

Q1.3. What do you see as the primary role of a craft educator in preserving and advancing traditional crafts?

Part 2: Teaching Philosophy and Methods

Q2.1. What is your approach to teaching craft skills and techniques? Do you emphasise tradition, innovation, or a balance of both?

Q2.2. How do you tailor your teaching to accommodate students with varying levels of experience or learning styles?

Q2.3. Do you incorporate modern tools or technologies into your teaching? If so, how do they complement traditional methods?

Part 3: Integration of Work and Education

Q3.1. Some students work while studying crafts. How do you support them in managing these dual responsibilities?

Q3.2. What is your perspective on apprenticeships or industry placements as part of craft education?

Part 4: Challenges and Opportunities in Craft Education

Q4.1. What are the biggest challenges you face as a craft educator today (e.g., declining interest, resources, curriculum constraints)?

Q4.2. What opportunities do you see for improving craft education at local, national, or European levels?

Q4.3. How do you address generational differences in attitudes toward traditional crafts and modern innovations?

Part 5: Cultural and Community Impact

Q5.1. How do you incorporate the cultural or historical significance of a craft into your teaching?

Q5.2. Do you collaborate with local communities, museums, or industry partners to enrich your students' learning experiences?

Part 6: Reflections and Future Outlook

Q6.1. What do you hope your students take away from their time learning under you?

Q6.2. How do you see the role of craft education evolving in the future, especially with the rise of digital tools and global markets?

Q6.3. If you could change one aspect of how crafts are taught or valued, what would it be?

Annex D – Framework for Self-Reflection: Craft Master Watching and Analysing Their Practice

Part 1: Descriptive Observation

Q1.1. Can you describe step-by-step what you are doing in this recording?

Q1.2. Are there any particular techniques or tools you are using here? What makes them significant to your craft?

Q1.3. Can you explain why you chose to perform certain actions in this way rather than alternative methods?

Part 2: Embodied Knowledge and Discovery

Q2.1. While watching this, did you notice anything you do instinctively but hadn't consciously thought about before?

Q2.2. Can you identify moments where your body's movement or muscle memory takes over?

Q2.3. Are there parts of the process that you realised have become automatic over time, and why do you think that is?

Part 3. Reflections on Learning and Practice

Q3.1. Has watching yourself perform helped you recognise any inefficiencies or areas for improvement?

Q3.2. Did observing this recording help you recall how or when you first learned a specific technique?

Q3.3. Have you noticed any unique traits or methods in your practice that might be worth passing on to students or apprentices?

Part 4. Emotional and Cultural Dimensions

Q4.1. How does it feel to watch yourself practising this craft?

Q4.2. Does observing your work remind you of any stories, traditions, or people who influenced your craft?

Q4.3. Are there cultural or personal values reflected in the way you approach your craft?

Part 5. Application and Future Implications

Q5.1. What new insights or ideas did you gain from watching yourself?

Q5.2. Would this reflection process change how you approach your work in the future? If so, how?

Q5.3. How do you think documenting and analysing these processes can benefit your craft, your students, or the broader community?

Annex E. Policy Memo

TO: Members of the European Parliament / Regional Ministers of Culture

FROM: Craeft Consortium

SUBJECT: From Heritage to Horizon: A Strategic Roadmap for European Craft Resilience

The Challenge: A Sector at a Crossroads

Traditional crafts are deeply embedded in Europe's cultural identity and local economies. However, the sector is currently facing a "perfect storm" of challenges:

- **The Skills Gap:** Over **50% of craft industries** struggle to attract young people, leading to an irreversible loss of tacit knowledge.
- **Economic Fragility:** Artisans face intense pressure from mass production and fragmented access to global markets.
- **Technological Lag:** While digital tools offer vast potential for preservation and training, adoption remains uneven across regions.

Strategic Recommendations for 2026–2030

To transform TCs from "heritage relics" into dynamic contributors to regional development, we propose the following policy interventions:

1. Modernising Education & Training (VET)

We must bridge the gap between historical methods and future needs.

- **Hybrid Curricula:** Develop Vocational Education and Training (VET) pathways that merge manual expertise with digital competencies like **3D modelling** and **AR/VR**.
- **Immersive Apprenticeships:** Use **Erasmus+** to fund cross-border exchanges that utilise digital repositories of craft techniques for remote learning.

2. Fiscal & Funding Interventions

Standard funding models often overlook the micro-scale nature of artisanal workshops.

- **Micro-Grant Schemes:** Deploy ERDF/ESF+ grants (€5,000–€25,000) specifically for **digital adoption** and e-commerce infrastructure.
- **Green Incentives:** Provide tax relief for artisans using **FSC-certified materials** or circular production models (e.g., recycled glass or silver).

3. Craft-Led Cultural Tourism

Crafts are the "original" circular economy and a primary driver for sustainable tourism.

- **Thematic Routes:** Integrate crafts into regional tourism strategies by creating **"Living Workshop" itineraries** that link heritage sites with active artisan studios.
- **Authenticity Labels:** Harmonise **Protected Geographical Indication (PGI)** labels to protect market integrity and consumer trust.

The Policy "Triple Bottom Line"

Dimension	Impact of Proposed Measures
Cultural	Safeguards intangible heritage through systematic digital documentation.
Economic	Opens global markets via e-commerce and high-value cultural tourism.
Social	Revitalises rural communities and provides viable career paths for youth.

Closing Statement

Traditional crafts are not just an echo of our past; they are a blueprint for a sustainable, resilient, and creative European future. By aligning craft policy with the **European Green Deal** and **digital innovation agendas**, we can ensure these vital industries don't just survive—they flourish.

References

1. Kirshenblatt-Gimblett, B. (2004). Intangible heritage as metacultural production1. Museum international, 56(1-2), 52-65.
2. Evans, G. (2019). Contemporary crafts as souvenirs, artifacts and functional goods and their role in local economic diversification and cultural development. In Souvenirs (pp. 127-146). Routledge.
3. Gauer, M. A. N. (2011). Crafting Identities: Female crafters and their expressions of identity through crafts (Master's thesis).
4. Brown, K. E., Brown, J., Muñoz Brenes, T., & Soto Chaves, A. (2018). Community crafts and culture: empowering indigenous communities. In HERITAGE 2018. Proceedings of the 6th International Conference on Heritage and Sustainable Development Conference. Green Lines Institute.
5. Schultz, K. (2002). Traditional arts and crafts for the future. Museum International, 54(1-2), 56-63.
6. Donkin, L. (2001). Crafts and conservation: Synthesis report for ICCROM.
7. UNESCO Living Human Treasures. Available online: https://ich.unesco.org/en/living-human-treasures, (accessed on 5 December 2024)
8. Chatterjee, A., & Alvelos, H. (2021). Hands Versus Fingers: Leveraging Digital Technology Towards Sustaining TCs and Industrial Practices. Perspectives on Design and Digital Communication: Research, Innovations and Best Practices, 197-209.
9. Wood, N. (2006). Transmitting craft knowledge: designing interactive media to support tacit skills learning. Sheffield Hallam University (United Kingdom).
10. Fuchigami, R., & Ishida, T. (2023). Virtual traditional craft simulation system in a mixed reality environment. International Journal of Grid and Utility Computing, 14(6), 553-561.
11. Fong, J. C. H., Poon, A. L. W., Ngan, W. S., Ho, C. H., Goepel, G., & Crolla, K. (2020). Augmenting Craft with Mixed Reality. In ACADIA (pp. 436-445).
12. Rogers, E. M. (1981). Diffusion of innovations: An overview. Use and impact of computers in clinical medicine, 113-131.
13. Travis, J. A. (2016). Devising an e-learning model for the teaching of TCs, such as ceramics (Doctoral dissertation, Manchester Metropolitan University).
14. Osman, S., & Zin, N. A. H. M. (2010, June). Proposed model for courseware development of virtual teaching and learning of traditional craft. In 2010 International Symposium on Information Technology (Vol. 1, pp. 1-6). IEEE.
15. Inalhan, G., Yang, E., & Weber, C. (2021). Place attachment theory. In A handbook of theories on designing alignment between people and the office environment (pp. 181-194). Routledge.
16. Florida, R., Gates, G., Knudsen, B., & Stolarick, K. (2006, December). The university and the creative economy.
17. Adams, C., Frost, G., & Webber, W. (2013). Triple bottom line: A review of the literature. The triple bottom line, 17-25.
18. Mariño, R., & Banga, R. S. (2016). UN Sustainable Development Goals (SDGs): A time to act. Journal of Oral Research, 5(1), 5-6.
19. RICHES project policy brief. Available online: https://resources.riches-project.eu/wp-content/uploads/2016/04/EUROPEAN-POLICY-BRIEF_Craft_final.pdf, (accessed on 5 December 2024)
20. Skublewska-Paszkowska, M., Milosz, M., Powroznik, P., & Lukasik, E. (2022). 3D technologies for intangible cultural heritage preservation—literature review for selected databases. Heritage Science, 10(1), 3.
21. Vilbrandt, T., Pasko, G., Vilbrandt, C., & Pasko, A. (2010). Digital Preservation of TCs and Three-Dimensional Modeling Technologies. International Journal of Arts and Sciences, 3(9), 1-10.

22. The Impact of Digital Technologies on TCs and Industries: https://itmunch.com/digital-technologies-on-crafts-and-industries/

23. A Digital Future for Cultural Heritage: https://amt-lab.org/blog/2020/3/a-digital-future-for-cultural-heritage

24. EUROPEAN GREEN DEAL. Available online: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en, (accessed on 5 December 2024)

25. Feilden, B. M., & Jokilehto, J. (2019). Management guidelines for world cultural heritage sites. 1998. Hist Cities: Issues Urban Conserv, 8, 425.

26. Kohsaka, R., & Rogel, M. (2021). Traditional and local knowledge for sustainable development: Empowering the indigenous and local communities of the world. In Partnerships for the Goals (pp. 1261-1273). Cham: Springer International Publishing.

27. Kofler, I., & Walder, M. (2024). Crafts and Their Social Imaginary: How Technological Development Shapes the Future of the Crafts Sector. Social Sciences, 13(3), 137.

28. Eneh, O. C. (2010). Artisanship Disconnect: Declining Technical Apprenticeship and Artisan Service and the Implications for Nigeria's Future Development. Asian Journal of Industrial Engineering, 2(2), 37-51.

29. Tomášková, A., & Śmietański, R. (2021). The Rise or Decline of Craft Trades? Evidence from Czech Republic and Poland. Economic Studies & Analyses/Acta VSFS, 15(2).

30. Weissbach, L. S. (1982). Artisanal responses to artistic decline: the cabinetmakers of Paris in the era of industrialization. Journal of Social History, 16(2), 67-81.

31. Karakul, Ã. Z. (2019). The effects of tourism on TCsmanship for the sustainable development of historic environments. European Journal of Sustainable Development, 8(4), 380-380.

32. Taheri, S., Khalilpour, F., Ashayeri, M., & Shabani, A. (2024). Handicrafts as cultural creative clusters: a spatial-cultural planning approach for the regeneration of the urban historical fabrics. International Journal of Tourism Cities.

33. Rahman, S. S., & Baddam, P. R. (2021). Community Engagement in Southeast Asia's Tourism Industry: Empowering Local Economies. Global Disclosure of Economics and Business, 10(2), 75-90.

34. Fu, Y. (2023). Regional Circulation Symbiosis: Study on the Sustainable Development of Regional Traditional Handicraft.

35. Newisar, M., Selim, G., & Li, M. (2024). Place-Based Perspectives on Understanding the Value of Sustainable Heritage-Inspired Arts and Crafts in Jordan. Sustainability, 16(17), 7547.

36. Zbuchea, A. (2022). TCs. A Literature Review Focused on Sustainable Development. Culture. Society. Economy. Politics, 2(1), 10-27.

37. Sun, Y., & Liu, X. (2022). How design technology improves the sustainability of intangible cultural heritage products: a practical study on bamboo basketry craft. Sustainability, 14(19), 12058.

38. Li, W. T., Ho, M. C., & Yang, C. (2019). A design thinking-based study of the prospect of the sustainable development of traditional handicrafts. Sustainability, 11(18), 4823.

39. Aytekin, B. A., & Rızvanoğlu, K. (2019). Creating learning bridges through participatory design and technology to achieve sustainability in local crafts: a participatory model to enable the transfer of tacit knowledge and experience between the TCsmanship and academic education. International Journal of Technology and Design Education, 29, 603-632.

40. Kofler, I., & Walder, M. (2024). Crafts and Their Social Imaginary: How Technological Development Shapes the Future of the Crafts Sector. Social Sciences, 13(3), 137.

41. Pandey, M. P., & Hasan, U. (2024). Empowering Indian Traditional Handicrafts Through Digitalization. In Digital Cultural Heritage (pp. 40-56). CRC Press.

42. Zoran, A. A. S. (2013). Hybrid re Assembage: Bridging Traditional Craft and Digital Design (Doctoral dissertation, Massachusetts Institute of Technology).

43. Zabulis, X., Meghini, C., Partarakis, N., Beisswenger, C., Dubois, A., Fasoula, M., ... & Galanakis, G. (2020). Representation and preservation of Heritage Crafts. Sustainability, 12(4), 1461.

44. Patel, N., Nindroda, V., & Patel, H. M. (2023, December). Preserving Cultural Heritage: Enhancing the Documentation and Promotion of Indian Handicrafts Through Machine Learning. In International Conference on Advancements in Smart Computing and Information Security (pp. 445-461). Cham: Springer Nature Switzerland.

45. Zabulis, X., Meghini, C., Dubois, A., Doulgeraki, P., Partarakis, N., Adami, I., ... & Stefanidi, Z. (2022). Digitisation of traditional craft processes. Journal on Computing and Cultural Heritage (JOCCH), 15(3), 1-24.

46. Sadar, J. S., & Chyon, G. (2011, October). 3D scanning and printing as a new medium for creativity in product design. In Proceedings of the Second Conference on Creativity and Innovation in Design (pp. 15-20).

47. Vilbrandt, T., Pasko, G., Vilbrandt, C., & Pasko, A. (2010). Digital Preservation of TCs and Three-Dimensional Modeling Technologies. International Journal of Arts and Sciences, 3(9), 1-10.

48. Kaufman, J. (2018). Replication and fabrication of crafted and natural artefacts by reverse engineering using single-camera photogrammetry. Lancaster University (United Kingdom).

49. Martorelli, M., Pensa, C., & Speranza, D. (2014). Digital photogrammetry for documentation of maritime heritage. Journal of Maritime Archaeology, 9, 81-93.

50. Feltz, W. J. (2017). A STUDY OF 3D PHOTOGRAMMETRY AND ONEOTA CERAMICS. La Crosse, Wisconsin, EUA: Universidade de Wisconsin-La Crosse.

51. Roy Chakraborty, K. (2022). Craft Stories: an augmented reality animated interactive documentary on craft artists from South Asia (Doctoral dissertation, OCAD University).

52. Ji, Y., Tan, P., & Duh, H. B. L. (2018). Research on personalised learning patterns in traditional handicraft using augmented reality: a case study of Cantonese porcelain. In Human-Computer Interaction. Interaction in Context: 20th International Conference, HCI International 2018, Las Vegas, NV, USA, July 15–20, 2018, Proceedings, Part II 20 (pp. 304-316). Springer International Publishing.

53. Arifitama, B., Syahputra, A., Permana, S. D. H., & Bintoro, K. B. Y. (2019, November). Mobile augmented reality for learning traditional culture using marker-based tracking. In IOP Conference Series: Materials Science and Engineering (Vol. 662, No. 2, p. 022038). IOP Publishing.

54. Cangiano, S., Fornari, D., & Seratoni, A. (2018). Re-enactment as a method (No. CHAPTER). Routledge.

55. Zabulis, X., Partarakis, N., Meghini, C., Dubois, A., Manitsaris, S., Hauser, H., ... & Metilli, D. (2022). A representation protocol for TCs. Heritage, 5(2), 716-741.

56. Zabulis, X., Meghini, C., Partarakis, N., Kaplanidi, D., Doulgeraki, P., Karuzaki, E., ... & Beisswenger, C. (2019). What is needed to digitise knowledge on Heritage Crafts? Mem. Rev, 4(1), 1-25.

57. Majewski, J. (2018). Playing with intangible heritage: Video game technology and procedural re-enactment. In Safeguarding Intangible Heritage (pp. 232-249). Routledge.

58. Wachowiak, M. J., & Karas, B. V. (2009). 3D scanning and replication for museum and cultural heritage applications. Journal of the American Institute for Conservation, 48(2), 141-158.

59. Kantaros, A., Ganetsos, T., & Petrescu, F. I. T. (2023). Three-dimensional printing and 3D scanning: Emerging technologies exhibiting high potential in the field of cultural heritage. Applied Sciences, 13(8), 4777.

60. Arnold, D., & Kaminski, J. (2014). 3D scanning and presentation of ethnographic collections—Potentials and challenges. Journal of Museum Ethnography, (27), 78-97.

61. Al-Baghdadi, M. A. S. (2017). 3D printing and 3D scanning of our ancient history: Preservation and protection of our cultural heritage and identity. International Journal of Energy and Environment, 8(5), 441-456.

62. Carre, A.L.; Dubois, A.; Partarakis, N.; Zabulis, X.; Patsiouras, N.; Mantinaki, E.; Zidianakis, E.; Cadi, N.; Baka, E.; Thalmann, N.M.; et al. Mixed-Reality Demonstration and Training of Glassblowing. Heritage 2022, 5, 103-128. https://doi.org/10.3390/heritage5010006

63. Ringas, C.; Tasiopoulou, E.; Kaplanidi, D.; Partarakis, N.; Zabulis, X.; Zidianakis, E.; Patakos, A.; Patsiouras, N.; Karuzaki, E.; Foukarakis, M.; et al. Traditional Craft Training and Demonstration in Museums. Heritage 2022, 5, 431-459. https://doi.org/10.3390/heritage5010025

64. Partarakis, N.; Zabulis, X. Applying Cognitive Load Theory to eLearning of Crafts. Multimodal Technol. Interact. 2024, 8, 2. https://doi.org/10.3390/mti8010002

65. Yang, H. O. (2023, July). Research on the Application of Interaction Design in the Digital Education of TCs. In International Conference on Human-Computer Interaction (pp. 221-238). Cham: Springer Nature Switzerland.

66. Pagán, E. A., Salvatella, M. D. M. G., Pitarch, M. D., Muñoz, A. L., Toledo, M. D. M. M., Ruiz, J. M., ... & Puren, M. (2020). From silk to digital technologies: a gateway to new opportunities for creative industries, TCs and designers. The SILKNOW case. Sustainability, 12(19), 8279.

67. Hung, C. S., Chen, T. L., & Lee, Y. C. (2021). From cultural heritage preservation to art and craft education: a study on Taiwan traditional lacquerware art preservation and training. Education Sciences, 11(12), 801.

68. Giang, N. T. (2023). INNOVATING EDUCATION IN THE DIGITAL ERA FOR THE TRADITIONAL FINE ARTS EDUCATION PROFESSIONS, THE APPLIED FINE ARTS TRAINING FIELD IN HANOI, VIETNAM. Проблемы современной науки и образования, (8 (186)), 66-73.

69. Zabulis, X., Partarakis, N., Demeridou, I., Doulgeraki, P., Zidianakis, E., Argyros, A., ... & Krivokapic, J. (2023). A roadmap for craft understanding, education, training, and preservation. Heritage, 6(7), 5305-5328.

70. Hui, J. S., Easterday, M. W., & Gerber, E. M. (2019). Distributed apprenticeship in online communities. Human–Computer Interaction, 34(4), 328-378.

71. Gheorghiu, D., & Stefan, L. (2016, April). Experimental online solutions for teaching TCs. In The International Scientific Conference eLearning and Software for Education (Vol. 2, p. 373). " Carol I" National Defence University.

72. Schmidt, M., Makhkamova, A., Spilski, J., Berg, M., Pietschmann, M., Exner, J. P., ... & Lachmann, T. (2020). 3 Competence Development with Digital Learning Stations in VET in the Crafts Sector. Research in Vocational Education edited by Eveline Wuttke• Jürgen Seifried Volume 4, 39.

73. Sabani, N. M., & Razak, N. A. (2022). GeeksFelting: Web-based learning for needle felting craft. Journal of ICT in Education, 9(3), 51-61.

74. Smirani, L., & Yamani, H. (2024). Analysing the Impact of Gamification Techniques on Enhancing Learner Engagement, Motivation, and Knowledge Retention: A Structural Equation Modelling Approach. Electronic Journal of e-Learning, 22(9), 111-124.

75. Mabalane, D. K. Unlocking Knowledge in the Digital Savanna: Innovative Approaches to Crafting E-Learning Experiences at the University of Botswana.

76. Quintela, J. A., & Palotás, G. (2023). E-Learning platforms in Heritage Education: A strategy to preserve TCsmanship. In Combining Modern Communication Methods With Heritage Education (pp. 101-114). IGI Global.

77. Martins, N., Pereira, L., Brandão, D., Raposo, D., Neves, J., & Silva, J. (2021, June). Craft Academy: Design of an e-learning solution for the handicrafts industries preservation. In 2021, 16th Iberian Conference on Information Systems and Technologies (CISTI) (pp. 1-6). IEEE.

78. Orphanidou, Y., Efthymiou, L., & Dekoulou, P. (2024). Creating an Innovative Vocational E-learning Model that Harnesses the Potential of Digital Cultural Heritage. In Business in Uncertainty: Evolution, Transformation and Adaptation Across Disciplines and Typologies (pp. 183-202). Cham: Springer Nature Switzerland.

79. Siliutina, I., Tytar, O., Barbash, M., Petrenko, N., & Yepyk, L. (2024). Cultural preservation and digital heritage: challenges and opportunities. Amazonia Investiga, 13(75), 262-273.

80. Trillo, C., Aburamadan, R., Mubaideen, S., Salameen, D., & Makore, B. C. N. (2020). Towards a systematic approach to digital technologies for heritage conservation. Insights from Jordan. Preservation, Digital Technology & Culture, 49(4), 121-138.

81. Fresa, A. (2014). Digital cultural heritage roadmap for preservation. International Journal of Humanities and Arts Computing, 8(supplement), 107-123.

82. Panezi, A. (2017). Europe's New Renaissance: New Policies and Rules for Digital Preservation and Access to European Cultural Heritage. Colum. J. Eur. L., 24, 596.

83. European COMMISSION RECOMMENDATION of 27 October 2011 on the digitisation and online accessibility of cultural material and digital preservation. Available online: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:283:0039:0045:EN:PDF, (accessed on 2-12-2024)

84. European Year of Cultural Heritage 2018. Available online: https://culture.ec.europa.eu/cultural-heritage/eu-policy-for-cultural-heritage/european-year-of-cultural-heritage-2018, (accessed on 2-12-2024)

85. Creative Europe. Available online: https://culture.ec.europa.eu/creative-europe, (accessed on 2-12-2024)

86. Siri, A. (2024). Advancing Science and Society: Unveiling the Societal Readiness Level (SRL) for Holistic Integration of Innovations.

87. Gamble, J. (2001). Modelling the invisible: The pedagogy of craft apprenticeship. Studies in continuing education, 23(2), 185-200.

88. Littoz-Monnet, A. (2013). The European Union and culture: Between economic regulation and

89. Gordon, C. (2010). Great expectations–the European Union and cultural policy: fact or fiction?. International journal of cultural policy, 16(2), 101-120.

90. De Witte, B. (2024). Legal framework of the EU's cultural policy. In European Union Economic Law and Culture (pp. 15-26). Edward Elgar Publishing.

91. Lähdesmäki, T. (2014). Identity politics in the European Capital of Culture initiative. Itä-Suomen yliopisto.91

92. Laursen, F. (2012). The Treaty of Maastricht.

93. Trif, F. (2019). EUROPEAN CULTURAL POLICY IN REGULATION OF THE MAASTRICHT AND LISBON TREATIES. Romanian Journal of Historical Studies, 2(2), 30-35.

94. Manin, P. (1998). The Treaty of Amsterdam. Colum. J. Eur. l., 4, 1.

95. Sacco, P. L. (2011). Culture 3.0: A new perspective for the EU 2014-2020 structural funds programming. OMC Working Group on Cultural and Creative Industries.

96. Cooke, P., & De Propris, L. (2011). A policy agenda for EU smart growth: the role of creative and cultural industries. Policy studies, 32(4), 365-375.

97. Hopkin, D. (2023). The'dying art'of lacemaking and the Flemish cultural revival. Datatèxtil, 2023(42).

98. Turner, W. H. K. (1964). Wool textile manufacture in Scotland: An historical geography. Scottish Geographical Magazine, 80(2), 81-89.

99. POLEMITOU, O. A. (1981). Tradition and Economics in Village Folk Crafts: The Lefkara Lace Making and Silversmithing Traditions (Doctoral dissertation, Indiana University).

100. Lefkara laces or Lefkaritika. Available online: https://ich.unesco.org/en/RL/lefkara-laces-or-lefkaritika-00255, (accessed on 2-12-2024)

101. Hughes, A. S. (2014). Persistence of ethnic dress traditions in contemporary society: An interpretive study of Germany's Black Forest Trachten (Master's thesis, Colorado State University).

102. Smith, J. S., & Tzachili, I. (2012). Cloth in Crete and Cyprus. British School at Athens Studies, 141-155.

103. Cipriano-Crespo, C., Freire-Paz, E., & Medina, F. X. (2023). The cultural revalorisation of the ceramics of Talavera: From folk culture to haute cuisine. International Journal of Gastronomy and Food Science, 32, 100683.

104. Revilla, G., & Dodd, T. H. (2003). Authenticity perceptions of Talavera pottery. Journal of Travel Research, 42(1), 94-99.

105. Kolláth, Á. (2021). The research history of Early Modern pottery in Hungary. ANTAEUS: COMMUNICATIONES EX INSTITUTO ARCHAEOLOGICO ACADEMIAE SCIENTIARUM HUNGARICAE, 37, 283-328.

106. Kolláth, Á. (2021). The research history of Early Modern pottery in Hungary. ANTAEUS: COMMUNICATIONES EX INSTITUTO ARCHAEOLOGICO ACADEMIAE SCIENTIARUM HUNGARICAE, 37, 283-328.

107. SÜLE, Á. K. (2010). On the functions of floral decorations in the houses of Budapest Art Nouveau. Art Nouveau & Ecology. Historical lab 1_Art Nouveau Herbarium.

108. Echegaray, E. P. (2024). The Transformation of the Medieval Iberian Economy 1200–1500. In The Routledge Handbook of Spanish History (pp. 38-48). Routledge.

109. Osterhaug, A. (2023). Nordic Hands: 25 Fiber Craft Projects to Discover Scandinavian Culture. Schiffer+ ORM.

110. Kuzmenkov, A., Galaktionov, O., Fedorova, A., & Emelianova, E. (2023). Possibilities of using wood and wood materials in the construction of the Republic of Karelia. In E3S Web of Conferences (Vol. 389, p. 01013). EDP Sciences.

111. CONSTANTIN, M. (2007). THE CRAFT-AND-MARKET PROCESS OF ARTISANSHIP IN POST-SOCIALIST ROMANIA. Canadian-American Slavic Studies, 41(4), vii-434.

112. Buchczyk, M. (2015). Beyond the Horniman Museum: history, heritage and craftsmanship in the collection of Romanian artefacts (Doctoral dissertation, Goldsmiths, University of London).

113. Ilieș, A., Wendt, J. A., Ilieș, D. C., Herman, G. V., Ilieș, M., & Deac, A. L. (2016). The patrimony of wooden churches, built between 1531 and 2015, in the Land of Maramureș, Romania. Journal of Maps, 12(sup1), 597-602.

114. Constantinescu, B. (2010). Romanian Architectural Wooden Cultural Heritage: The Present Status: A Survey. In Wood science for conservation of cultural heritage-Braga 2008: proceedings of the international conference held by Cost action IE0601 in Braga (Portugal) 5-7 November 2008.-(Proceedings e report; 67) (pp. 1000-1006). Firenze University Press.

115. Namicev, P., & Namiceva, E. (2018). Wood carving, traditional art embedded in the historic objects. Palimpsest International Journal for Linguistic, Literary and Cultural Research, 3(6), 227-239.

116. Giusti, L., & Polo, M. C. (2002). A review of the glass-making industry of Murano (Venice, Italy) under an environmental perspective. Environmental Management and health, 13(1), 40-54.

117. Langhamer, A. (2003). The legend of Bohemian glass: A thousand years of glassmaking in the heart of Europe. Tigris.

118. Black, R. D. (2021). Damasquinado: The Metalworking that Helped Shape Contemporary Spain (Master's thesis, Ohio University).

119. Lane-Poole, S. (1896). The story of the Moors in Spain.

120. Hill, B. (2014). Silversmithing: A Contemporary Guide to Making. Crowood.

121. Brorsson, T. (1998). In the workshop of the Viking age goldsmith: gold-and silverwork at Borgeby in Scania, southern Sweden. Fornvännen, 4, 225-239.

122. Skjerven, A. (2014). Norwegian rural jewelry traditions in the era of globalization.

123. Immonen, V. (2006). Sámi spoons as artefacts of ethnicity: archaeological reflections on an ethnographic artefact group. People, Material Culture and Environment in the North, 42.

124. Ernstell, M. (2023). Donation of 18th-century Swedish silver items. Art Bulletin of Nationalmuseum Stockholm, 28(2021), 9-12.

125. Koumara-Tsitsou, S., & Karachalis, N. (2021). Traditional products and crafts as main elements in the effort to establish a city brand linked to sustainable tourism: promoting silversmithing in Ioannina and silk production in Soufli, Greece. Place Branding and Public Diplomacy, 17, 257-267.

126. Marchand, S. L. (2020). Porcelain: a history from the heart of Europe. Princeton University Press.

127. Granger, A. A. (1923). The ceramic industries of France since the end of the 19th century. Journal of the American Ceramic Society, 6(1), 205-212.

128. Mangani, S. M. E., Mazzinghi, A., Mandò, P. A., Legnaioli, S., & Chiari, M. (2021). Characterisation of decoration and glazing materials of late 19th-early 20th century French porcelain and fine earthenware enamels: a preliminary non-invasive study. The European Physical Journal Plus, 136(10), 1079.

129. Falke, J. (1875, January). The Late Imperial Porcelain Manufactory in Vienna: III. Third Period. 1784-1805. In The Workshop (Vol. 8, No. 3, pp. 33-39). Thomas J. Watson Library, The Metropolitan Museum of Art.

130. Vladimirovna, S. N. O. (2019). Still-Lifes of "The Lesser Dutches" as Primary Sources: "The German Flowers" Motifs in Porcelain Ware of European Countries. Journal of Danubian Studies and Research, 9(1).

131. STREJC, J. Development of the porcelain factory Thun 1794 as Nová Role.

132. KUZVART, M. (1992). Kaolin deposits of Central Europe. Clay Science, 8(6), 319-327.

133. CENTURY, N. (2000). THE MARBLE TRADE. The lustrous trade: material culture and the history of sculpture in England and Italy, c. 1700-c. 1860, 156.

134. Primavori, P. (2015). Carrara marble: A nomination for 'global heritage stone resource'from Italy. Geological Society, London, Special Publications, 407(1), 137-154.

135. White Carrara. Available online: https://www.platformarchitecture.it/en/white-carrara-2024-design-is-back/, (accessed on 3-12-2024)

136. SALTA, M. (2019). CHAPTER SEVEN THE NEOCLASSICAL CEMETERY OF HAGHIOI PANTES [ALL SAINTS] AT LEONIDION: A NOTABLE GLYPTOTHEQUE OF TINIAN ARTISTS ON THE ARCADIAN SHORE, GREECE. Ancient Greek Art and European Funerary Art, 147.

137. Littrell, M. A. (1990). Symbolic significance of textile crafts for tourists. Annals of Tourism Research, 17(2), 228-245.

138. Abdou, A. H. (2020). The Role of TCs Centres in Maintaining Heritage and its Impact on Promoting Tourism (Case Study: Foustat TCs Centre–Cairo, Egypt). International Journal of Eco-Cultural Tourism, Hospitality Planning and Development, 3(2), 47-68.

139. Littrell, M. A. (1990). Symbolic significance of textile crafts for tourists. Annals of Tourism Research, 17(2), 228-245.

140. John, C. (2024). Smellscapes of Provence. In Sensory Tourism: Senses and SenseScapes Encompassing Tourism Destinations (pp. 155-172). GB: CABI.

141. Peach, A. (2007). Craft, souvenirs and the commodification of national identity in 1970s' Scotland. Journal of design history, 20(3), 243-257.

142. Shah, A., & Patel, R. (2017). Problems and challenges faced by handicraft artisans. Voice of Research, 6(1), 57-61.

143. Partarakis, N., & Zabulis, X. (2023). Safeguarding TCs in Europe. Encyclopedia, 3(4), 1244-1261.

144. Council, C., & Ireland, C. N. (2012). Craft in an Age of Change. London: Crafts Council. http://wcc-europe.org/sites/default/files/Craft_in_an_Age_of_Change.pdf and http://www.nesta.org.uk/blog/where-do-creatives-cluster.

145. Vilmar, A. (2023). "We Know What We Are Doing": Campaign Toolbox against the Shortage of Young People in Skilled Crafts Professions. In Social Marketing and Sustainable Development Goals (SDGs) Case Studies for a Global Perspective (pp. 79-94). Cham: Springer International Publishing.

146. Cetinkaya, G. (2009). Challenges for the maintenance of traditional knowledge in the Satoyama and Satoumi ecosystems, Noto Peninsula, Japan. Human Ecology Review, 27-40.

147. Tomášková, A., & Śmietański, R. (2021). The Rise or Decline of Craft Trades? Evidence from Czech Republic and Poland. Economic Studies & Analyses/Acta VSFS, 15(2).

148. Lähdesmäki, T., Čeginskas, V. L., Kaasik-Krogerus, S., Mäkinen, K., & Turunen, J. (2020). Creating and Governing Cultural Heritage in the European Union: The European Heritage Label (p. 300). Taylor & Francis.

149. Traditional Craftsmanship. Available online: https://ich.unesco.org/en/traditional-craftsmanship-00057, (accessed on 4 December 2024)

150. UNESCO Creative Cities Network. Available online: https://www.unesco.org/en/creative-cities (accessed on 4 December 2024)

151. Etsy. Available online: https://www.etsy.com/ (accessed on 4 December 2024)

152. Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. Available online: https://www.unesco.org/en/legal-affairs/convention-means-prohibiting-and-preventing-illicit-import-export-and-transfer-ownership-cultural, (accessed on 16 January 2025)

153. Malyshev, O. O. (2021). Theodoric the Great's Legislation on the Protection of Monuments and the Significance of the Ostrogothic Renaissance in the Context of Heritage Law History. Constitutional state, 32, 166-178. http://jnas.nbuv.gov.ua/article/UJRN-0001262686 [In Ukrainian].

154. Brovarets, T. (2021). A Grave Cross on Eastern-Slavonic Ritual Towels: Life and Death on Textiles. Eikon/Imago, 10.

155. Hung, C. S., Chen, T. L., & Lee, Y. C. (2021). From cultural heritage preservation to art and craft education: a study on Taiwan traditional lacquerware art preservation and training. Education Sciences, 11(12), 801.

156. Dai, Y., & Hwang, S. H. (2019). Technique, creativity, and sustainability of bamboo craft courses: Teaching educational practices for sustainable development. Sustainability, 11(9), 2487.

157. Colardyn, D., & Bjornavold, J. (2004). Validation of formal, non-formal and informal learning: Policy and practices in EU member states. European journal of education, 39(1), 69-89.

158. Preston, A. A. (1994). The decline of the craft apprenticeship system with particular reference to the construction industry (Doctoral dissertation, University of Southampton).

159. Muehleman, S., Wolter, S., & Joho, E. (2018). Apprenticeship training in Italy: a cost-effective model for firms?.

160. Bonnal, L., Mendes, S., & Sofer, C. (2002). School-to-work transition: apprenticeship versus vocational school in France. International journal of manpower, 23(5), 426-442.

161. Winkelmann, R. (1996). Employment prospects and skill acquisition of apprenticeship-trained workers in Germany. ILR Review, 49(4), 658-672.

162. Chan, S. (2014). Crafting an occupational identity: Learning the precepts of craftsmanship through apprenticeship. Vocations and learning, 7, 313-330.

163. Osman, S., Saharı, N., & Zın, N. A. M. (2012). Development of interactive multimedia courseware (E-craft) for craft education. Turkish Online Journal of Distance Education, 13(4), 36-54.

164. SkillShare. Available online: https://join.skillshare.com (accessed on 5 December 2024)

165. Coursera. Available online: https://www.coursera.org (accessed on 5 December 2024)

166. Amarneh, B. M., Alshurideh, M. T., Al Kurdi, B. H., & Obeidat, Z. (2021, May). The Impact of COVID-19 on E-learning: Advantages and Challenges. In The international conference on artificial intelligence and computer vision (pp. 75-89). Cham: Springer International Publishing.

167. Ryu, S. H. (2024). Research on Digital Content Development for AR-Based Traditional Craft Education and Training-Focusing on Lacquer Thread Sculpture. International Journal of Internet, Broadcasting and Communication, 16(1), 72-79.

168. Haltner, P., Goddy-Worlu, R., Forren, J., Nicholas, C., & Reilly, D. (2023, October). A Comparative Evaluation of AR Embodiments vs. Videos and Figures for Learning Bead Weaving. In 2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR) (pp. 1191-1200). IEEE.

169. MFA Programme in Crafts, Jewellery Art. Available online: https://www.gu.se/en/study-gothenburg/mfa-programme-in-crafts-jewellery-art-k2til-smyk, (accessed on 9 December 2024)

170. Royal College of Art, London. Available online: https://www.rca.ac.uk/ (accessed on 9 December 2024)

171. Crafting Europe. Available online: https://www.craftingeurope.com/ (accessed on 5 December 2024)

172. European Heritage Label. Available online: https://ehl-bureau.eu/en/ (accessed on 5 December 2024)

173. Creative Europe program. Available online: https://culture.ec.europa.eu/creative-europe (accessed on 9 December 2024)

174. Cultural and Creative Industries. Available online: https://research-and-innovation.ec.europa.eu/research-area/social-sciences-and-humanities/cultural-heritage-and-cultural-and-creative-industries-ccis_en Cultural and Creative Industries, (accessed on 9 December 2026)

175. Digital Agenda for Europe. Available online: https://www.europarl.europa.eu/factsheets/en/sheet/64/digital-agenda-for-europe (accessed on 9 December 2024)

176. Horizon 2020. Available online: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-2020_en (accessed on 9 December 2024)

177. Horizon Europe. Available online: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en, (accessed on 9 December 2024)

178. The European exchange programme for Entrepreneurs. Available online: https://www.erasmus-entrepreneurs.eu/ (accessed on 9 December 2024)

179. Craeft. Available online: https://www.craeft.eu/ (accessed on 9 December 2024)

180. G.H. Elder "Perspectives on the life course", in Elder, G. (ed.), Life course dynamics trajectories and transitions, 1968–1980, Ithaca, NY: Cornell University Press: 23–49, 1985.

181. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

182. Elder, G. H. (2003). The emergence and development of life course theory. Handbook of the life course/Springer.

183. UNESCO inscription 2015. Available online: https://ich.unesco.org/en/RL/tinian-marble-craftsmanship-01103, (accessed on 4 February 2025)

184. Psiloritis UNESCO Global Geopark. Available online: https://www.unesco.org/en/iggp/geoparks/about (accessed on 4 February 2025)

185. UNESCO inscription 4.COM 13.39, 2009. Available online: https://ich.unesco.org/en/RL/aubusson-tapestry-00250, (accessed on 4 February 2025)

186. Munro, J. H. (2007). Textiles, Towns, and Trade: Essays in the Economic History of Late-Medieval England and the Low Countries. Ashgate Publishing.

187. Mazzarella, F., Mitchell, V., & Escobar-Tello, C. (2017). Crafting sustainable futures. The value of the service designer in activating meaningful social innovation from within textile artisan communities. The Design Journal, 20(sup1), S2935-S2950.

188. Greenhalgh, P. (Ed.). (2003). The persistence of craft: the applied arts today. Rutgers University Press.

189. Guy, J. (2009). Indian textiles in the East: from Southeast Asia to Japan. (No Title).

190. Cort, C. R. C. (1986). The Brocades of Banaras. Traditional Folk Textiles and Dress: Selected Readings and Bibliography, 139.

191. Mukhopadhyay, T. P. (Ed.). (2022). Issues and Challenges of the Indian Handloom Sector: A Legal Perspective. https://dx.doi.org/10.21659/rupkatha

192. Zhao, F. (2014). Weaving technology. In A History of Chinese Science and Technology: Volume 2 (pp. 379-493). Berlin, Heidelberg: Springer Berlin Heidelberg.

193. Dalby, L. C. (2001). Kimono: fashioning culture. Random House.

194. Niinimäki, K., & Hassi, L. (2011). Emerging design strategies in sustainable production and consumption of textiles and clothing. Journal of Cleaner Production, 19(16), 1876-1883.

195. Needham, J. (1983). Science and Civilisation in China: Volume 5, Chemistry and Chemical Technology, Part 5, Spagyrical Discovery and Invention: Physiological Alchemy (Vol. 5). Cambridge University Press.

196. Gillette, M. B. (2016). China's Porcelain Capital. Bloomsbury Academic.

197. Maezaki, S. (2009). Qing-style porcelain in Meiji Japan: The ceramic art of Seifu Yohei III. University of London, School of Oriental and African Studies (United Kingdom).

198. Koehler, R. (2015). Korean ceramics: the beauty of natural forms (Vol. 11). Seoul Selection.

199. Saraswati, B. (1978). Pottery-making cultures and Indian civilisation. Abhinav Publications.

200. Maria, C. D. MATHEMATICS OF BYZANTINE SILVERSMITHS.

201. Paolicchi, A. (2024). Silversmiths in Southeastern Europe: Visual Culture between Islam, Byzantium, and the Latin West. In The Routledge Handbook of Byzantine Visual Culture in the Danube Regions, 1300-1600 (pp. 293-309). Routledge.

202. Dautović, V. (2022). [Abstracts of papers] Southeast European Silversmithing: Liturgical Objects and the Construction of a Cultural, Technological and Iconographical Network in the Early Modern Period.

203. Gerd, L. (2020). Russian Sacred Objects in the Orthodox East. Museikon. A Journal of Religious Art and Culture/Revue d'art et de culture religieuse, 4(4), 227-236.

204. Richards, G. (2007). Cultural tourism: Global and local perspectives. Psychology Press.

205. Cummings, K. (1997). Techniques of kiln-formed glass. University of Pennsylvania Press.

206. Reischman, D. (2022). Glass in the Art World: How Glass Crosses over into Contemporary Art (Master's thesis, Fashion Institute of Technology, State University of New York).

207. McCray, W. P. (2017). Glassmaking in Renaissance Venice: the fragile craft. Routledge.

208. Adam, S. (1966). The technique of Greek sculpture in the archaic and classical periods.

209. Mylonopoulos, J. (2009). Greek Art. Oxford University Press.

210. Strong, D. E., Toynbee, J. M., & Ling, R. (1995). Roman art (Vol. 44). Yale University Press.

211. Dodge, H. (1987). The Architecture of the Roman Empire Vol. II an Urban Appraisal. By WL MacDonald. 316 pages, 213 figs. Yale University Press, New Haven, 1986.£ 28. Libyan Studies, 18, 158-158.

212. Janson, H. W., & Janson, A. F. (1995). History of Art, New York: Harry N. Abrams Inc, Rev. Eb, 19r, 9.

213. Hayao Miyazaki: a new large-scale tapestry project in Aubusson. https://www.nouvelle-aquitaine-tourisme.com/en/happening-now/hayao-miyazaki-a-new-large-scale-tapestry-project-in-aubusson (accessed on 19 January 2025)

214. Huang, X. (2019). Understanding Bourdieu: cultural capital and habitus. Rev. Eur. Stud., 11, 45.

215. Miller, R. L. (2018). Rogers' innovation diffusion theory (1962, 1995). In Technology adoption and social issues: Concepts, methodologies, tools, and applications (pp. 1558-1571). IGI Global.

216. Florida, R., & Gabe, T. (2024). Assessing the rise and geography of the creative economy. Handbook of Creativity Assessment, 215-233.

217. Sala, S. (2020). Triple bottom line, sustainability and sustainability assessment, an overview. Biofuels for a more sustainable future, 47-72.

218. Zwiers, S., Markantoni, M., & Strijker, D. (2018). The role of change-and stability-oriented place attachment in rural community resilience: a case study in south-west Scotland. Community Development Journal, 53(2), 281-300.