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SYNERGY OF CHINESE CRAFTSMANSHIP AND ARTIFICIAL INTELLIGENCE

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Purpose: Contemporary crafts are changing and evolving, incorporating new technologies into crafts practices. This article explores the issues of innovative technologies and crafts within the context of Artificial Intelligence (AI). It aims to specify the phases of AI implementation in Chinese crafts, the accompanying frameworks, aspects, methodologies indicated in the literature, and to characterize future research directions and methods for encouraging craftsmen to implement AI. The above aims to fill the existing research gap in the craft space and examine potential good practices that can be transferred to the craft field in other countries.
Design/methodology/approach: The article draws upon a review of the relevant literature identified through the scientific databases Web of Science and Scopus.
Findings: Four main approaches to the topic of crafts and new technologies were identified: the use of AI in artistic crafts, the idea of the Chinese "craftsman spirit," AI & machines, and other aspects related to crafts. The generated terms outlined the popularity of specific terms in scholarly works devoted to the studied issues. Furthermore, two directions for future research were identified: i) artisan entrepreneurship dynamics, and ii) determining the phases of AI introduction in Chinese crafts. Moreover, the preliminary methods outlined in the analyzed texts to encourage craftsmen to adopt AI were specified.
Originality/value: The principal contribution lies in developing guidelines for craftsmen considering the integration of AI into their craft practices, serving both as a thematic guide and as a foundation for future research on applying emerging technologies in craftsmanship. The findings also enhance awareness of the economic significance of new technologies within the craft sector.
Keywords: chinese craft, new technologies, innovative technologies, Artificial Intelligence (AI), craft skills, cultural economics, sustainable development.
Category of the paper: Research paper.

1. Introduction

The resurgence of craftsmanship, its ruptured renaissance (Buechley, Perner-Wilson, 2012), is evident in the interest in craft skills and the culture of "Do It Yourself" (DIY) and unique craft products, the emergence of digital production and hybrid forms of making, the metamorphosis and redefinition of the position of craft skills, techniques, patterns and materials, as well as the promotion of sustainable practices (Woolley et al., 2015). Many features distinguish craft activity, including: i) understanding and engagement with materials, ii) use of tactile skills and hand-operated tools, iii) non-mass production, iv) influence of the creator on the concept, design and aesthetics of the finished product, v) cultural embeddedness of the finished product and vi) refinement of skills acquired over time (CEARTE, 2017). This article addresses the latter, which relates to the craft industry's adaptation to ongoing technological changes. These changes are driven by advances in the sector, which not only influence the characteristics of manufactured products and services but also stem from market forces, competitive observations, and stakeholder expectations. The use of new technologies in crafts is described not only as an inevitable process but also as a necessary approach to optimally utilizing potential, a prerequisite for effectively coping with constant change, maintaining competitiveness, increasing productivity, optimizing work processes, and improving customer communication (Kocak, Pawlowski, 2024).

Crafts are evolving and open to interdisciplinary work (Niedderer, Townsend, 2012), which is evident in design, economics, computer science, engineering, and robotics. As the digital generation increasingly engages in analog crafts, not only models focused on one space but also those that combine both are becoming popular, as used, for example, by the e-commerce platform Etsy (Westecott, 2011). This synergy is also associated with pedagogical innovations (Kermik, 2012). For example, in Finland, crafts are seen as an innovative school subject that engages creative thinking and modern practices related to digital materials (Kouhia, Kokko, 2022). This relationship is two-way. Research by LaMore et al. (2013) indicates, among other things, that craftsmanship is related to a country's ability to educate innovative scientists and engineers. These researchers noted that graduates of science, technology, engineering, and mathematics programs are significantly more likely to possess extensive skills in arts and crafts than the average person (in this case, the study involved professionals from the Honors College at Michigan State University, and their results were compared to those of average Americans). Furthermore, experiences in arts and crafts are significantly correlated with the creation of patentable inventions and the founding of new businesses. In particular, lifelong exposure to arts and crafts is most beneficial for innovators and entrepreneurs (LaMore et al., 2013). Table 1 presents examples of features linking elements of craftsmanship and other sciences, including those involving new technologies, to which contemporary scientific research is devoted.

Table 1.
Common features linking elements of craftsmanship and new technologies

Elements of synergy	Common/ new features	Source
Crafts, design practices, digital technologies.	Practices passed down from generation to generation include access to technology (nowadays, analogue-digital methods, the use of computer tools, and exploring the digital world).	Duarte-Poblete et al. (2024)
Craftsmanship, manufacturing technologies, digital design.	Requires experimentation, creativity, and time to master.	Ohayō (2024)
Mathematics, technology, art.	Improvements in computer-aided design and 3D printing technologies are transforming complex designs into feasible designs.	Handmade Business (n.d.)
Computer generative systems, craft knowledge, digital production technologies.	A new way to design and create unique works.	Marshall, Univer, Atkinson (2007)
Craft, interaction design (giving form to computational materials).	Care in the process of creation and through the artifact.	Tsaknaki, Vallgårda (2023)
- Electronics, crafts (related to sculpting, sewing, and painting). - Crafts, art, design. - Art, crafts, computing.	Hybrid craft categories, digital design as a craft form, and expanding technological cultures.	Buechley, Perner-Wilson (2012)
Digital work, craft practice.	The importance of personalization in production and consumption within a culture. Comparing hand and brain activity during computer use and activities requiring personal engagement and tacit knowledge.	Bunnell (2004)

Source: own study.

Some researchers point to the current shift from modern craftsmanship towards the era of post-craftsmanship – crafts that engage with digital technologies (Flanagan, Xue, 2024). However, attitudes toward crafts and technology are not uniform across the globe. Autio et al. (2019) noted, that these differences stem from differences in national curricula, pedagogical traditions, and cultural differences in technology.

In the People's Republic of China, Artificial Intelligence (AI) is described as an opportunity to accelerate productivity growth in an aging society. Barton et al. (2017) highlight the following opportunities offered by AI: improving productivity (supporting or replacing humans), streamlining industrial machinery, supporting supply chains and logistics, predicting failures, identifying bottlenecks, automating processes and decisions, and creating new products and services, new professions, and new companies. These researchers also emphasize that, internationally, China has the largest workforce engaged in activities that can be technically automated (Barton et al., 2017). *A development plan for the next generation of artificial intelligence* was established in China as early as 2017, establishing 2030 as an essential point on the timeline, indicating leadership plans in the field of AI, both in economic terms and within the framework of ethical standards and norms (Roberts et al., 2021).

China is currently considered a global leader in technology, including AI. The country aspires to become a global innovation hub and is reducing its dependence on non-Chinese technologies, increasing its self-sufficiency in next-generation information technologies (Lu, Morell, 2021). Ma, Zhang (2024) draw attention to the potential for international knowledge diffusion, as evidenced by tangible results such as the number of patents filed by

the Chinese Patent Office. In 2024, China ranked 11th (out of 133 economies) in the Global Innovation Index for its innovation potential (Global Innovation Index 2024, 2024). The state's central role mainly drives the development of AI in China, its strategic role in stimulating technological progress and industrial modernization (Zheng, 2024), and then through private-sector technology companies and academic research. AI has also been described as a key driver of international competition, primarily with the United States. AI is a strategic priority for China, particularly motivating it to implement AI faster than in other countries (Uber, 2020).

Considering the above, and the fact that China's implementation of technological policies is an essential source of knowledge for other countries (Abdikarov, 2023), this article focuses on presenting the environment of Chinese crafts and the issues of new technologies limited to AI. The article aims to answer the following questions: i) What are the distinct phases of AI application in Chinese crafts? ii) What frameworks, aspects, and methodologies have been applied in the existing literature to address these issues? iii) What are the future directions for research? iv) Which methods of encouraging craftsmen to adopt AI are significant enough to be used by skilled trades people and craft stakeholders in other countries?

2. Literature review – crafts and new technology

The report *Understanding the New Technological Context for Craftsmanship* (Ohayō, 2024) provides preliminary direction regarding the researched issue, including treating new technologies in crafts as a complement to traditional craft skills, used alongside analog tools, as tools with prospects. The most accessible new technologies include: Computer-Aided Design (CAD) software, 3D modeling, 3D printing, Computer Numerical Control (CNC) production systems, and AI. The potential of innovative technologies in the context of craftsmanship lies in their focus on improving profitability and working conditions (including efficiency and speed), differentiating from the competition, and their application in the areas of design, production, material handling, customer relations, management, sales, communication, and learning systems (Ohayō, 2024). Practical considerations of emerging technologies in their application to craftsmanship are presented in Table 2. Table 3 summarizes the concerns and potential threats of new technologies in the crafts space.

Table 2.
Practical aspects of new technologies from the point of view of their application in crafts

Element of new technologies	Practical aspect	Source
Internet of Things	– Development of new digital business models. – Optimization of existing processes.	Pomp et al. (2022)
New technology (as a general category)	– Interest in crafts among the younger generation. – Adapting crafts and adapting them to contemporary demands. – Creating new professions.	District Employment Agency in Mława (n.d.)
Digital technology	– Understanding the potential of a given material (beyond its traditional uses) and expanding its "boundaries". – Simplifying the production process. – Increasing efficiency. – Increasing market competitiveness. – Cheaper prototyping. – Faster prototyping.	Ohayō (2024)
New technology (as a general category including, among others: CAD, 3D printing, CNC, Laser cutting, Thread Control Digital Loom TC2, scanning, acoustic applications, inkjet printing, digital design software, water jet cutting, puk welding, cutting plotter)	– Ability to develop and test new projects. – Ability to maintain digital documentation of products and ongoing work. – Improved management processes (including customer management and customer service). – Improved communication. – Improved accounting and billing. – Reduced prototyping time and costs. – Facilitated experimentation and testing. – Ability to incorporate other disciplines (previously unrelated to crafts) into craft production.	
Digital technology	– Enabling new creative opportunities that were not previously activated due to financial and time costs or the impossibility of implementing them.	Perry (2016)
New technology (as a general category)	– Blurring the perception of boundaries between traditional handicrafts and technologically advanced creativity. – Shorter turnaround times. – Creating products that are attractive to buyers. – Supporting career transitions in crafts.	Handmade Business (n.d.)
New technology (as a general category)	– Changing the way crafts are created, shared, and sold. – Supporting process improvement, reaching a wider audience, and preserving craftsmanship. – Changing the way crafts are appreciated.	Unleasher Innovation (n.d.)
CAD	– Enabling precise design.	
Graphic design software (e.g. Adobe Illustrator, CorelDraw)	– Assistance in creating digital projects, with the option of printing or transferring them to physical media.	
3D modeling software (e.g. Blender, Rhino)	– They enable the creation of prototypes or precise forms.	Unleasher Innovation (n.d.)
Laser cutting and engraving	– Capable of precise cutting in a variety of materials and precise machining. – Possibility of personalized engraving.	
3D printing	– Ability to create custom parts, molds and finished products.	
E-commerce and digital markets	– Unlimited sales to the local market. – Ability to build a personal brand. – Ability to analyze customers, their behavior, preferences, and purchasing patterns, which are the basis for creating marketing strategies and product customization.	
Social media platforms	– The opportunity to share work, present and promote ideas, and increase market visibility. – The opportunity to create a community around crafts and build partnerships. – Offering tutorials.	

Cont. table 2.

CAD	– Enabling precise design.	CEARTE (2017)
Graphic design software (e.g. Adobe Illustrator, CorelDraw)	– Assistance in creating digital projects, with the option of printing or transferring them to physical media.	
3D modeling software (e.g. Blender, Rhino)	– They enable the creation of prototypes or precise forms.	
Laser cutting and engraving	– Capable of precise cutting in a variety of materials and precise machining, – Possibility of personalized engraving.	
3D printing	– Ability to create custom parts, molds and finished products.	
E-commerce and digital markets	– Unlimited sales to the local market. – Ability to build a personal brand. – Ability to analyze customers, their behavior, preferences, and purchasing patterns, which are the basis for creating marketing strategies and product customization.	
Social media platforms	– The opportunity to share work, present and promote ideas, and increase market visibility. – The opportunity to create a community around crafts and build partnerships. – Offering tutorials.	
New technology (as a general category)	– Enabling digital skills learning and craft teaching online.	
New technology (as a general category)	– Mitigating environmental impact. – Contributing to the value of craftsmanship in terms of maintaining national identity and regional traditions, strengthening local communities. – International exhibition.	Sohoni, Kothari (2024)

Source: own study.

Pomp et al. (2022) point out that local crafts and small and medium-sized enterprises lack the knowledge to assess the potential of IoT solutions. Creating a platform dedicated to craftspeople, enabling them to independently implement new solutions, could be helpful. Its goal would be to support the identification of suitable IoT use cases and the resulting business models, including the review of components (e.g., sensors) without specialized knowledge in these areas (Pomp et al., 2022).

Table 3.
Concerns about introducing new technologies into craft practices

Fears/ Threats	Source
– Lack of specialist knowledge to assess the potential of new technologies and their adaptation to one's own needs.	Pomp et al. (2022)
– High costs (of materials, machinery, access to licenses). – Difficulty of mastering. – Time-consuming to master. – Concern about the loss of meaning and ethos of craftsmanship, including the loss of traditional craftsmanship, craft skills, and the bond between craftspeople and craft consumers. – Concern about the depersonalization of products – stripping them of their individuality and uniqueness. – Fear of job loss or devaluation of traditional skills. – Loss of control over production. – Ethical and environmental concerns regarding, among other things, materials, energy requirements, and ethical implications of using AI. – Concern about compromising authenticity. – Concern about inconsistency with the cultural or artistic identity of the tradition. – Loss of well-being resulting from experience and direct contact with the material.	Ohayō (2024)
– Loss of importance of crafts. – Disappearance of some crafts.	District Employment Agency in Mława (n.d.)
– Associating advanced technologies not with a craft workshop, but with an industrial park. – The need to acquire new skills. – The need to invest in hardware or software. – Unfavorable comments from other creators regarding new working methods. – Stereotypes of creators as refugees from the modern world.	Handmade Business (n.d.)
– - Unequal access due to specialized skills, equipment and tools.	CEARTE (2017)
– The aspect of cultural authenticity. – The aspect of respect for tradition.	Olalere (2016)
– Possibility of deepening inequalities between groups of people with lower and higher qualifications (including due to the area of education, gender, and place of residence – cities/villages).	Barton et al. (2017)
– The need to introduce reforms.	Hu (2021)

Source: own study.

Dedicated programs are fostering the implementation of new technologies in crafts. The first example is a project implemented in collaboration with the Distributed Design Platform and World Crafts Council Europe. It focused on supporting craftspeople in adapting and utilizing information and communication technology tools to promote innovative forms of creativity that integrate cutting-edge digital production technologies. It included participation in an online master class program, which included workshops and work sessions focused on new and emerging digital markets for creative industries, collaborative practices and sustainability, and design for action, engagement, and resilience (FABLABBCN, n.d.). In addition to creating platforms, projects aimed at revitalizing, valorizing, and supporting traditional craft techniques combined with groundbreaking technologies involve the development of methodologies, curricula, entrepreneurial skills, and vocational training courses (Ministère Chargé De L'enseignment Supérieur Et De La Recherche, n.d.).

Another proposed solution is to engage universities in the topic in terms of sharing knowledge and inspiring (Perry, 2016).

3. Material and Methods

This article attempts to conduct a Structured Literature Review (SLR) of the texts indexed in two scientific databases – Web of Science (WoS) and Scopus. Texts were selected using keywords linked by AND/OR operators, presented in Table 4.

Table 4.
Quantitative data regarding the SLR

	WoS	**Scopus**
Keywords: Chinese OR China	2,821,278	2,231,452
Keywords: craftsman OR craftsmen OR artisan OR skilled trades people	10,217	13,202
Keywords: AI OR artificial intelligence	411,456	884,608
Keywords: Chinese OR China AND craftsman OR craftsmen OR artisan OR skilled tradespeople AND AI OR artificial intelligence	7	13
Duplicates removed	0	-4
Negative selection	-1	-1
Texts analyzed	6	8
The sum of the texts analyzed	14	

Source: own study.

Seven texts were obtained from the WoS database and 13 from Scopus. Four duplicates were found, *two texts that did not concern the researched issue were also rejected*[1], so 14 texts were included in the analysis. A Tab delimited file from the WoS database and a CSV file from Scopus were downloaded. The obtained bibliographic and text data were analyzed using VOSviewer version 1.6.20 separately for each database. Subsequently, the content of the selected texts was analyzed.

4. Results

4.1. Bibliographic data

The analyzed publications were published between 2013 and 2025. Particular research interest in the discussed topics was visible between 2020 and 2022, and in 2025 (Figure 1). The dominant subject areas were Social Sciences (WoS: 2, Scopus: 5), Computer Sciences (Scopus: 5), and Arts and Humanities (WoS: 2, Scopus: 4), illustrated in Figure 2. Most texts were scientific articles (WoS: 5, Scopus: 6) and proceedings papers (WoS: 2, Scopus: 5), published in English. All texts were affiliated or co-affiliated with both databases of Chinese academic institutions. The most significant number of texts were assigned to China (WoS: 5,

[1] One text referred to the work of the artist Ai Weiwei, whose surname is not an abbreviation for artificial intelligence. The second text was only an introduction to the conference devoted to the broad concepts of new technologies and did not include text data that could be analyzed.

Scopus: 7). In terms of citations, China (WoS: 63) and the United States (Scopus: 176) lead the way.

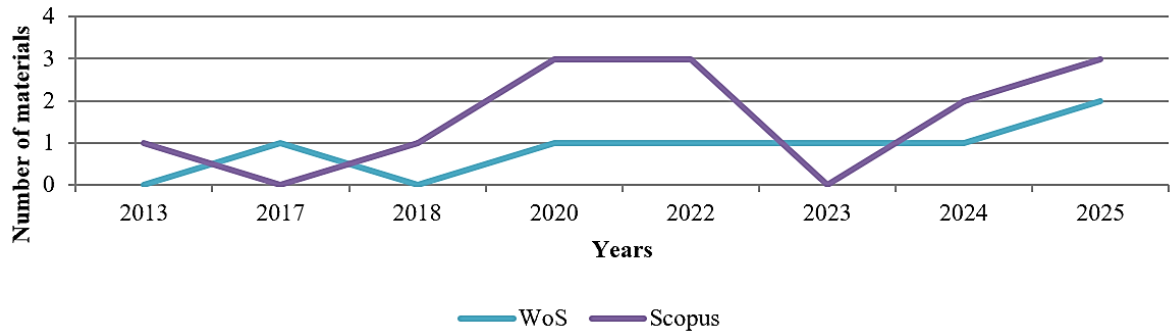


Figure 1. Number of publications in the period 2013-2025.

Source: own study.

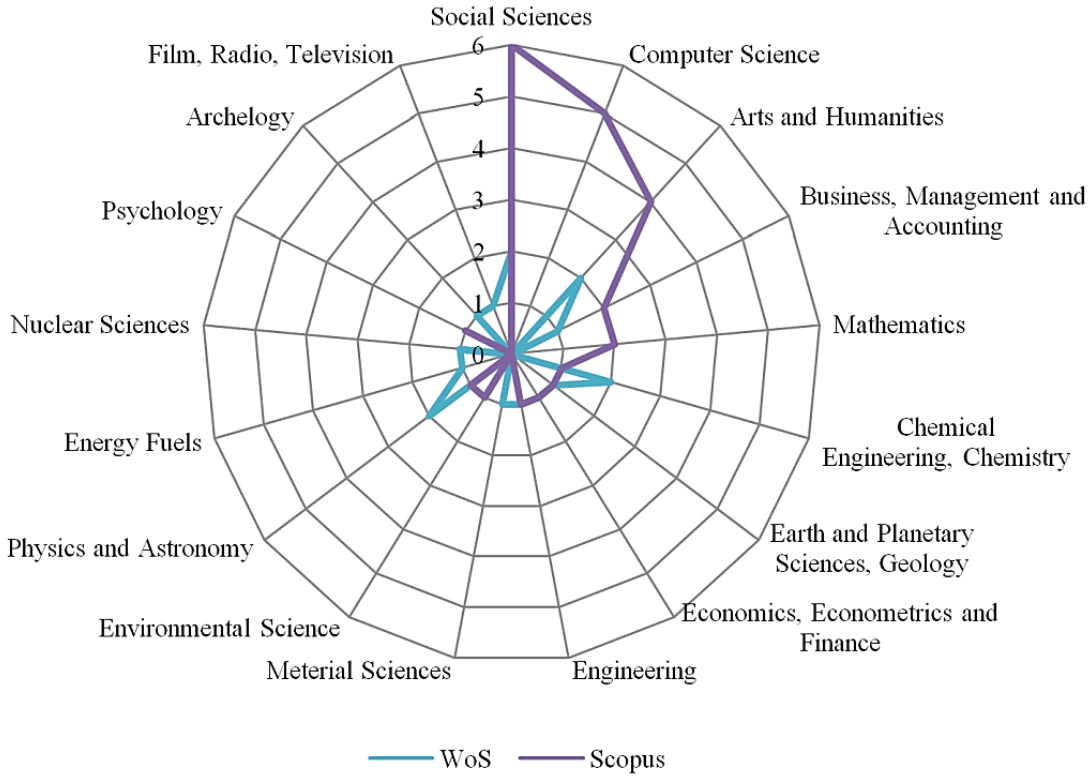


Figure 2. Number of publication divided into subject areas.

Source: own study.

The primary bibliographic data broken down by both databases are presented in Table 5.

Table 5.
Main bibliographic data of the analyzed texts (in number)

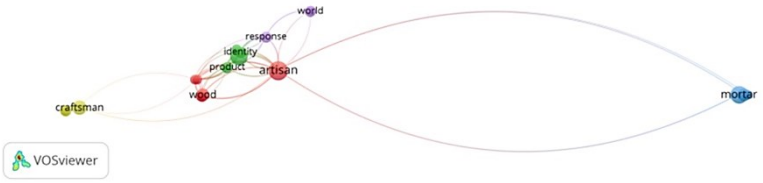
Category		WoS	Scopus
Type	– Article.	5	7
	– Proceeding papers.	2	5
	– Book.	-	1
Language	– English.	7	12
	– Chinese.	-	1
Affiliation	– Chinese.	7	13
	– Non-Chinese.	-	11
Country/ territory	– China.	5	7
	– United States.	-	2
	– Australia.	-	1
	– Colombia.	-	1
	– Finland.	1	1
	– Italy.	1	-
	– Peru.	1	1
	– Portugal.	1	1
	– Switzerland.	1	1
	– United Arab Emirates.	1	-
Citation-country	– China.	63	-
	– Portugal.	5	3
	– Colombia.	-	4
	– Switzerland.	3	4
	– United Arab Emirates.	3	-
	– United States.	-	176

Source: own study.

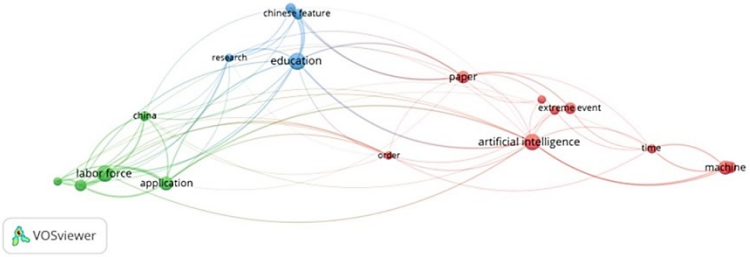
4.2. Text data

Text data from the titles and abstracts of the analyzed texts indicate that the texts indexed in both databases are not thematically homogeneous. They can be divided into cluster terms, as shown in Figure 3a-b. The WoS database contains five clusters: i) craftsmen and readout technique, ii) mortar, iii) word, iv) artisan and AI, and v) product and identity. The Scopus database contains three clusters: i) labor force and service industry, ii) research and education, and iii) AI and machine. Figure 3c-d indicates the timeline of the analyzed terms. The oldest terms in WoS include: 'word', 'craftsmen', and 'Chinese feature'. The youngest terms include: 'wood', 'product', and 'extreme event'. The last visualization (Figure 3e-f) indicates the level of intensification of exploring given terms (the brighter the field, the more advanced the exploration).

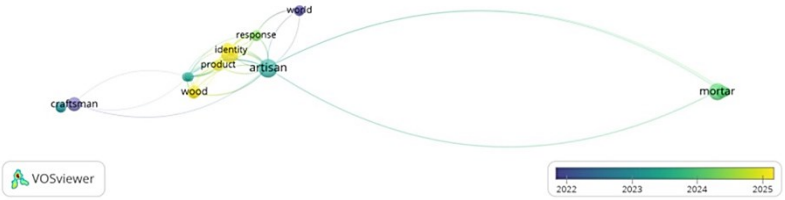
a) WoS*



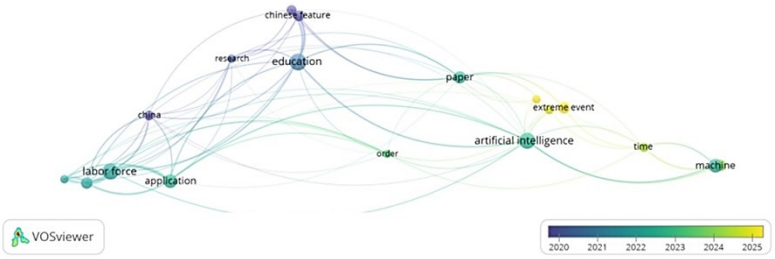
b) Scopus**



c) WoS*

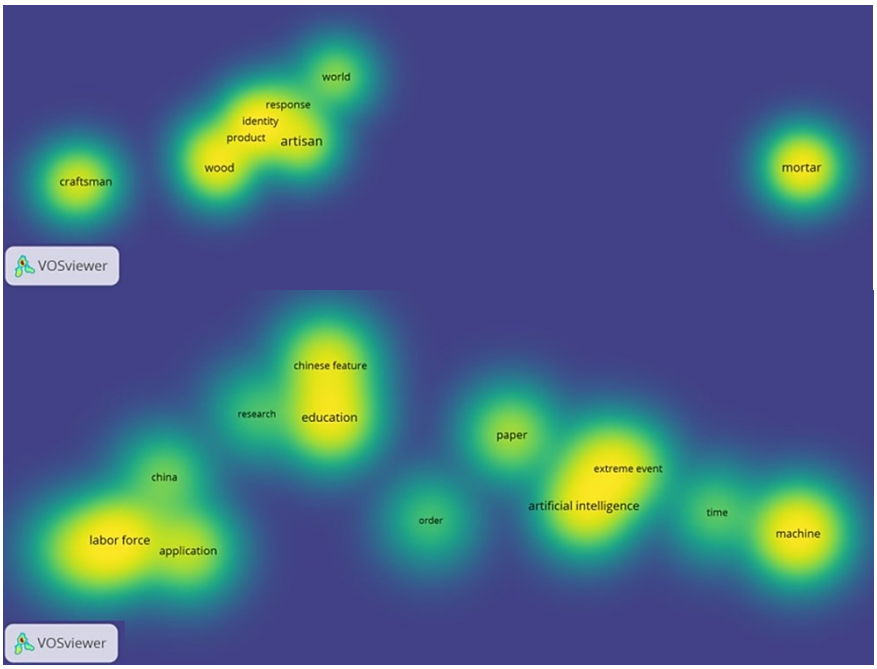


d) Scopus**



e) WoS

f) Scopus**



* Detailed data for WoS: title and abstract field, full counting method, minimum number of occurrence of a term: 3; of the 286 terms, 19 meet the threshold.

** Detailed data for Scopus: title and abstract field, full counting method, number of occurrence of a term: 5; of the 715 terms, 18 meet the threshold.

Figure 3a-f. Visualizations of the terms: a-b) network visualization, c-d) overlay visualization, e-f) density visualization

Source: own study.

The selected articles focus on four main themes: i) the use of AI in the work of artisans, ii) the idea of the "spirit of craftsmanship" with Chinese characteristics, iii) AI in working with machines, and iv) other aspects related to craftsmanship.

Artistic crafts are addressed in the context of producing carved wood window grilles characteristic of traditional Chinese architecture. X.H. Kang and J. Wang (2025) explore the potential of using new technologies, including image-generating AI (Stable Diffusion Model/SDM), to optimize design by combining traditional elements with innovative styles. The article focuses on presenting a translational transformation of crafts aimed at shortening the product research and development cycle, accelerating the process of converting ideas into products, and improving production efficiency (Kang, Wang, 2025). Another example of traditional crafts is the craft of kite-making, which is struggling with generational replacement and declining public interest. Zhang et al. (2025) present a solution to these challenges by integrating generative AI and launching a connected interactive platform through which individuals can create kite designs themselves.

Another topic discussed here is the idea of "craft spirit," which now extends beyond craft workshops. In this context, AI is discussed in conjunction with the education of preschool children and their teachers to increase innovation awareness and technological knowledge in the youngest (Meng, Xin, Fan, 2022). Intelligent strategies for developing craftspeople within the apprenticeship system and creating a modern craft improvement system are the central theme of the text by H.-J. Ni (2020). The article addresses the importance of educating Chinese craftspeople and developing the craft spirit, explaining that it refers to the pursuit of excellence, professionalism, and professional ethics. Nowadays, the craft spirit encompasses five dimensions: psychological characteristics, technical skills, responsibility, energy immersion, and innovation (Ni, 2020).

The issue of AI and machine work is presented in two ways through the mythology of the era of artificial intelligence – presenting myths related to the creation of self-moving devices (Mayor, 2018) and references to quite general observations that we operate in an era of co-creation of machines and scientists, engineers and skilled craftsmen, enabling the performance of "more creative" work (Li et al., 2024). In the article written by M. Mousa, A. Arslan, and T. Lange (2025), the researchers determined the impact of extreme events (including the COVID-19 pandemic, political changes, and the war in Ukraine) on reorienting the entrepreneurial identity of Egyptian artisan entrepreneurs selling handmade dresses, carpets, and papyrus. AI was mentioned here as one of the specific factors (besides stable demand, long-standing social networks, stable consumer tastes, the number of tourists, and government support) influencing the stability or change of this entrepreneurial identity due to extreme events. The second aspect is accepting AI's contribution and treating it as a "co-creator" or "team member", adapting to changes (Mousa, Arslan, Lange, 2025).

Craftsmanship is also used as an indirect reference in the articles studied. For example, He et al. (2023), focusing on nuclear data detection and reading techniques, use the quote "A craftsman must sharpen his tools to do his job" by Confucius. However, its significance refers to the vital preparation process, not to tools or craftsmanship. The preparation and material selection aspect is also emphasized in Zai et al. (2024) study of organic additives used in mortars in the Gugong Palace Museum (Forbidden City). This text highlights the adherence of Chinese craftsmen to principles oriented towards practicality and functionality when selecting materials (Zhai et al., 2024).

5. Discussion

The integration of AI into the craft sector represents a dynamic intersection of tradition and innovation. The reviewed literature highlights four thematic pillars: (i) AI in artisan work, (ii) the evolving concept of the "craftsman spirit," (iii) AI in collaboration with machines, and (iv) broader cultural and educational dimensions.

In the realm of artistic crafts, Kang and Wang (2025) demonstrate how image-generating AI models such as Stable Diffusion can optimize the design of traditional Chinese wood carvings. Their study emphasizes a translational transformation of craftsmanship, aiming to shorten the product development cycle and enhance production efficiency. Similarly, Zhang et al. (2025) address the declining popularity of kite-making by proposing an interactive platform powered by generative AI, enabling users to co-create designs and thereby revitalize public interest.

The notion of the "craftsman spirit" is redefined in contemporary discourse. Ni (2020) outlines five dimensions—psychological characteristics, technical skills, responsibility, energy immersion, and innovation—as essential to modern craftsmanship. This expanded framework is reflected in educational initiatives, such as those described by Meng, Xin, and Fan (2022), which integrate AI into preschool pedagogy to foster technological literacy and creativity from an early age.

The relationship between AI and machine work is explored through both mythological and practical lenses. Mayor (2018) discusses historical myths of self-operating devices, while Li et al. (2024) frame the current era as one of co-creation between machines, scientists, engineers, and skilled artisans. Mousa, Arslan, and Lange (2025) further contextualize this relationship by examining how extreme events—such as the COVID-19 pandemic and geopolitical instability—have reshaped the entrepreneurial identity of Egyptian artisans. Their findings suggest that AI functions not only as a technological tool but also as a stabilizing agent and creative partner.

Craftsmanship also appears as a metaphor in technical disciplines. He et al. (2023) invoke Confucius' adage—"A craftsman must sharpen his tools to do his job"—to underscore the importance of preparation in nuclear data detection. Zhai et al. (2024) highlight the practical ethos of Chinese craftsmen in material selection for mortars used in the Forbidden City, reinforcing the principle of functionality over form.

Collectively, these studies illustrate that AI is not merely an external force acting upon the craft sector but is increasingly embedded within its cultural, educational, and economic fabric. The narratives constructed around AI emphasize future potential, suggesting that its adoption is both a strategic and symbolic act of modernization.

5.1. Economic significance of new technologies within the craft sector

The economic implications of AI and related technologies in the craft sector are substantial and multifaceted. Several key dimensions emerge from the literature:

- Efficiency and acceleration of production AI tools such as SDM facilitate rapid prototyping and design iteration, reducing the time and cost associated with traditional methods (Kang, Wang, 2025).
- Revitalization of traditional crafts interactive platforms and generative design tools help preserve endangered crafts by engaging new audiences and enabling participatory creation (Zhang et al., 2025).
- Entrepreneurial adaptability in volatile socio-political contexts, AI contributes to the resilience of artisan entrepreneurs by offering alternative modes of production and market engagement (Mousa, Arslan, Lange, 2025).
- Expansion of market access digital technologies allow craftspeople to reach global consumers, transcending geographic limitations and fostering cross-cultural exchange.
- Cultural preservation through innovation - the digitization of traditional motifs and techniques ensures the continuity of cultural heritage while allowing for stylistic evolution.
- Human capital development educational initiatives that incorporate AI into craft training programs prepare future generations for hybrid roles that combine manual skill with digital fluency (Meng, Xin, Fan, 2022; Ni, 2020).

These findings suggest that the economic significance of new technologies in the craft sector extends beyond productivity gains. It encompasses cultural sustainability, entrepreneurial resilience, and the strategic modernization of artisanal practices. Future research should explore these dynamics in a comparative international context, considering economies at varying stages of development.

The reviewed literature highlights promising avenues for future research in the intersection of AI and craftsmanship. One key direction involves mapping the phases of AI adoption within specific craft disciplines, particularly in the Chinese context where such applications are rapidly evolving. While the current studies emphasize potential and conceptual frameworks, empirical

research is needed to assess long-term impacts on productivity, cultural preservation, and artisan identity.

Another important trajectory is the comparative analysis of artisan entrepreneurship across different economic environments. Mousa, Arslan, and Lange (2025) suggest that extreme events influence entrepreneurial identity, but further cross-national studies could reveal how AI mediates resilience and innovation in both developed and developing economies.

Additionally, future research should explore the ethical and philosophical dimensions of AI as a "co-creator" in artistic processes. This includes examining how artisans perceive authorship, originality, and value in works partially generated by machines. Investigating educational models that integrate AI into craft training—especially among youth—could also provide insights into shaping the next generation of hybrid artisans.

Finally, interdisciplinary collaborations between technologists, anthropologists, and designers may yield new frameworks for understanding how digital tools transform not only production methods but also the social and symbolic meanings of craft.

6. Conclusions

The research presented in this article focused on the following issues: i) phases of AI application in Chinese crafts, ii) frameworks, aspects, and methodologies that have been applied, iii) identifying future directions for research, and iv) methods of encouraging craftsmen to adopt AI. The analysis conducted allowed us to observe a noticeable increase in interest in AI within the craft sector and a dominance of research in the Chinese scientific community. The analyzed texts did not directly address the phases of AI application in Chinese crafts. However, it is possible to identify phases of scientific interest in AI and crafts related to the terms used by researchers, presented illustratively in Figure 4. It provides a basis for future research directions. Other future directions mentioned be researches included artisan entrepreneurship dynamics, studied not in the context of representatives of a single country but in an international environment, taking into account economies at different levels of development.

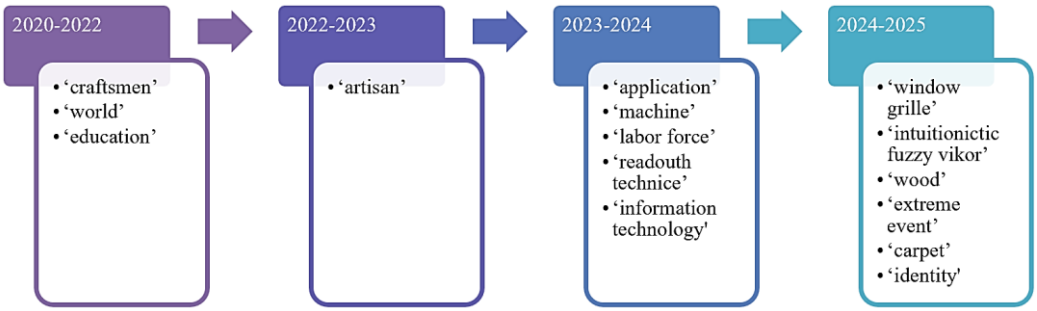


Figure 4. Popularity of terms appearing in the titles and abstracts of the analyzed texts.

Source: own study.

The topics of the analyzed materials are related to four main groups of themes: i) AI + artisans, ii) "craftsman spirit," iii) AI + machines, and iv) other aspects related to crafts. The applied research methods included: case study methodological approach, interviews with artisan entrepreneurs and entrepreneur-craftsmen, classical literature review, and optimization design method. Narratives regarding AI in the context of crafts were built with a clear emphasis not on the present, but on the future. The advantages of its use were associated with improving the design and production process, reaching stakeholders, and bottom-up engagement in the cultural heritage. These aspects can be treated as the first group of methods to encourage craftsmen to adopt AI. Educating the younger generation and increasing their awareness and technological knowledge also play an essential role here.

The above may indicate that research interest in AI within Chinese crafts is growing, as is the case in other economic sectors. Although China is among the countries most intensively developing AI capabilities, its application in crafts is not yet developed enough to allow for the identification of distinct application phases—phases that would enable its adoption within crafts in other economies. Thus, the topic of new technologies in crafts, with particular emphasis on AI, currently constitutes a research gap in itself and an area for further research.

The limitations of this study include its reliance solely on existing data. This limitation is also related to the specific nature of the SLR, which focused on concluding solely from texts indexed in only two databases, including the omission of gray literature, a primary emphasis on analyzing English-language materials, and a review of texts based on very rigorous selection criteria.

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References

1. Abdikarov, R. (2023). Technological Rise of China. *Eurasian Research Journal, 5, 3*, pp. 71-84, doi: 10.53277/2519-2442-2023.3-04
2. Autio, O., Jamsek, J., Soobik, M., Thorsteinsson, G., Olafsson, B. (2019). Craft and Technology Education Curriculums and Students' Attitudes towards Craft and Technology in Finland, Slovenia. Estonia and Iceland. *International Journal of Technology in Education and Science, 3, 2*, pp. 95-106.

3. Barton, D., Woetzel, J., Seong, J. M., Tian, Q.Z. (2017). *Artificial Intelligence: Implications for China*. Discussion paper presented at the 2017 China Development Forum. McKinsey Global Institute.
4. Buechley, L., Perner-Wilson, H. (2012). Crafting technologies: Reimagining the processes, materials, and cultures of electronics. *ACM Trans. Comput.-Hum. Interact. 19*, *3*, doi: 10.1145/2362364.2362369
5. Bunnell, K. (2004). *Craft and digital technology*. World Crafts Council 40th Anniversary Conference in Metsovo, Greece.
6. CEARTE (2017). *Crafts 3.0. Supporting the transition of handicraft teachers and trainers to the Digital Age*. IO2: Training Modules on ICT-based teaching methods in VET for crafts sector, 2017-1-ES01-KA202-038435, Centro de Formação Profissional do Artesanato, Portugal.
7. Contreras Castañeda, E.D., Gordillo Galeano, J.J., Olaya Rodríguez, K.J. (2024). Lean-Kaizen startup in panela production processes: the case of a trapiche. *Cogent Engineering, 11, 1*, 2322834, doi: 10.1080/23311916.2024.2322834
8. District Employment Agency in Mława (n.d.). *Craftsmanship in the light of tradition and innovation [Rzemiosło w świetle tradycji i innowacji],* Powiatowy Urząd Pracy w Mławie. Retrieved from: https://mlawa.praca.gov.pl/-/rzemioslo-w-swietle-tradycji-i-innowacji, 10.08.2025.
9. Duarte-Poblete, S.S., Linb, Y. S., Romaniac, A., Lid, J.Y., Rognolia, V. (2024). A materials designs practice between crafts, creativity and technology. In: *Design across borders united in creativity* (pp. 2074-2094). Cumulus Conference Proceedings Series, Monterre: Cumulus Association.
10. FABLABBCN (n.d.). *Bringing together the traditional crafts practices with new digital* technologies. Retrieved from: https://fablabbcn.org/services/bringing-together-the-traditional-crafts-practices-with-new-digital-technologies, 10.08.2025.
11. Flanagan, P.J., Xue, R.Z. (2024). *After the digital – re-materialising digital ecologies of craft*. ISEA2024: 29th International Symposium on Electronic Art.
12. Global Innovation Index 2024 (2024). *China ranking in the Global Innovation Index 2024.* Retrieved from: https://www.wipo.int/edocs/gii-ranking/2024/cn.pdf, 14.08.2025.
13. Handmade Business (n.d.). *New Technologies and Handmade Craft*. Retrieved from: https://handmade-business.com/new-technologies-and-handmade-craft-2/, 10.08.2025.
14. He, R., Niu, X.Y., Wang, Y., Liang H.W., Liu, H.-B., Tian, Y. et al. (2023). Advances in nuclear detection and readout techniques. *Nuclear Science and Techniques, 34, 205*, doi: 10.1007/s41365-023-01359-0
15. Hu, M.N. (2021). Big Data Technology in Relevance Analysis of Chinese Traditional Arts and Crafts Garden Courses. *International Journal of Educational Curriculum Management and Research, 2, 1*, pp. 1-7, doi: 10.38007/IJECMR.2021.020101

16. Kang, X.H., Wang, J. (2025). Design optimization of wood-carved window grilles in historical architectures using stable diffusion model and intuitionistic Fuzzy VIKOR. *Humanities, Social Sciences Communication, 12*, 972, doi: 10.1057/s41599-025-05388-5
17. Kermik, J. (2012). *Design and craft - a changing relationship at the heart of design education*. Design Education Asia Conference 2012. Hong Kong: Design Institute, 4-5 December, Hong Kong.
18. Kocak, S., Pawlowski, J. (2024). Crafting the Future: Developing and Evaluating a Digital Mindset Competence Model for the Industrial Craft Sector. *Proceedings of the 16th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2024), 3(KMIS)*, pp. 108-119, doi: 10.5220/0013029000003838
19. Kouhia, A., Kokko, S. (2022). At the intersection of the digital and the material: teaching and learning crafts during the pandemic. *Research in Art and Education, 2*, doi: 10.54916/rae.122976
20. La More, R., Root-Bernstein, R., Root-Bernstein, M., Schweitzer, J.H., Lawton, J.L., Roraback, E., Peruski, A., Van Dyke, M., Fernandez, L. (2013). Arts and Crafts: Critical to Economic Innovation. *Economic Development Quarterly, 27, 3*, pp. 221-229, doi: 10.1177/0891242413486186
21. Li D., Yin J., Zhang T. et al. (2024). The Four Most Basic Elements In Machine Cognition. *Data Intelligence, 6*, *2*, pp. 297-319, doi: 10.1162/dint_a_00254
22. Lu, J., Morell, Y., Alcover, Y. (2021). *China Fundamental Equities China: Navigating the push towards technology leadership*. White paper for professional investors, September 2021, ROBECO.
23. Ma, X., Zhang, Y. (2024). How do Multinationals Impact China's Technology? The Role of Quid Pro Quo Policy and Technology Spillovers. *Munich Personal RePEc Archive,* 121055.
24. Marshall, J., Univer, E., Atkinson, P. (2007). *AutoMAKE: generative systems, digital manufacture and craft production*. 10th Generative Art Conference, Milan, 13-15 December 2007.
25. Mayor, A. (2018). *Gods and Robots: Myths, Machines, and Ancient Dreams of Technology*. Palo Alto, CA: Stanford University.
26. Meng, L., Xin, Q., Fan, Q. (2022). Application of Artificial Intelligence in Pre-school Education Professional Talent Training in the Era of Big Data. In: W. Fu, G. Sun (Eds.), *E-Learning, e-Education, and Online Training. eLEOT 2022. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, 454*. Cham: Springer, doi: 10.1007/978-3-031-21164-5_50

27. Ministère Chargé de l'enseignment Supérieur et de la Recherche (n.d.). *Traditional crafts for the future: a new approach*. HORIZON-CL2-2022-HERITAGE-01-04. Retrieved from: https://www.horizon-europe.gouv.fr/traditional-crafts-future-new-approach-25535, 10.08.2025
28. Mousa, M., Arslan, A., Lange, T. (2025). When extreme events become the norm: how do artisan entrepreneurs adapt identity? *International Journal of Organizational Analysis, 33*, *12*, pp. 35-55, doi: 10.1108/IJOA-07-2024-4647
29. Ni, H.-J. (2020). Research on Smart Artisan on Modern Apprenticeship Pattern in the Era of Artificial Intelligence. *IOP Conf. Series: Earth and Environmental Science, 546*, 052032, doi: 10.1088/1755-1315/546/5/052032
30. Niedderer, K., Townsend, K. (2012). Tracing the essence of craft. *Craft Research, 3*, doi: 10.1386/crre.3.3_2
31. Ohayō (2024). *Understanding the New Technological Context for Craftsmanship*. Bruxelles: European Crafts Alliance.
32. Olalere, F.E. (2016). *Cultural hybridity: an effective adoption of rapid product development to enhance indigenous craft designs*. The Proceedings of the 17th Annual International Conference of the Rapid Product Development Association of South African (RAPDASA 2016).
33. Perry, G. (2016). Are computers killing off craft? Not a chance. *The Guardian*. Retrieved from: https://www.theguardian.com/higher-education-network/2016/may/12/are-computers-killing-off-craft-not-a-chance, 10.08.2025.
34. Pomp, A., Burgdorf, A., Paulus, A., Meisen, T. (2022). Towards Unlocking the Potential of the Internet of Things for the Skilled Crafts. *Proceedings of the 24th International Conference on Enterprise Information Systems (ICEIS 2022), 1*, pp. 203-210, doi: 10.5220/0011066100003179.
35. Roberts, H., Cowls, J., Morley, J., Taddeo, M., Wang, V., Floridi, L. (2021). The Chinese approach to artificial intelligence: an analysis of policy, ethics, and regulation. *AI & SOCIETY, 36*, pp. 59-77, doi: 10.1007/s00146-020-00992-2
36. Sohoni, S.N., Kothari, D.N. (2024). Craftsmanship And Technology: A New Dialogue In Fashion. *International Journal of Creative Research Thoughts (IJCRT), 12*, *10*, pp. 450-456.
37. Tsaknaki, V., Vallgårda, A. (2023). Craft as a matter of care to inspire the design of computational things. In: S. Holmlid, V. Rodrigues, C. Westin, P.G. Krogh, M. Mäkelä, D. Svanaes, Å. Wikberg-Nilsson (Eds.), *Nordes 2023: This Space Intentionally Left Blank*, Norrköping: Linköping University, doi: 10.21606/nordes.2023.47
38. Uber, M.R. (2020). *China's Artificial Intelligence Ecosystem*. National Intelligence University.

39. Unleasher Innovation (n.d.). *How Technology Is Transforming the Craft Industry*. Retrieved from: https://khmerculture.net/how-technology-is-transforming-the-craft-industry/, 10.08.2025.
40. Westecott, E. (2011). Crafting Play: Little Big Planet, Loading… *The Journal of the Canadian Game Studies Association, 5*, *8*, pp. 90-100.
41. Woolley, M., Sabiescu, A., Waelde, C., Cummings, C., Modest, W., Konniger, S., Wippo, M., van Dijk, D. (2015). *D5.1 The Use of Craft Skills in New Contexts*. RICHES.
42. Zhai, K.R., Zhu, H., Luo, L., Zhang, B.J., Zhu, L.G., Zhang, Q., Zhao, P. (2024). Exploration of the rules for the use of organic additives in the mortar of the Forbidden city. *Journal of Cultural Heritage, 70*, pp. 71-79, doi: 10.1016/j.culher.2024.08.017
43. Zhang, S., Lyu, D., Nie, K., Li, Z. (2025). Interactive AI-Driven Platform for the Traditional Kite Patterns Design. In: M. Rauterberg (Ed.), *Culture and Computing. HCII 2025. Lecture Notes in Computer Science, 15800*. Cham: Springer, doi: 10.1007/978-3-031-93160-4_14
44. Zheng, Y.N. (2024). The middle technology trap: China in a comparative perspective. *Asian Review of Political Economy, 3*, *11*, doi: 10.1007/s44216-024-00030-8