

Cultural Opportunities and Challenges in the Digital Era: A Study on the Inheritance, Dissemination, and Innovation of Chinese Culture Based on ChatGPT

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Abstract: In the context of the digital age, ChatGPT, as a novel technology and medium, presents fresh opportunities for the inheritance, dissemination, and innovation of Chinese culture, while also introducing novel challenges. This paper employs established theories of cultural communication to investigate the utilization of ChatGPT for the inheritance, dissemination, and innovation of Chinese culture. This research contributes to fostering the creative transformation and innovative development of Chinese culture in the digital era, enhancing the capacity to narrate China's stories in the new age, boosting cultural self-confidence and unity among the Chinese people, and elevating the global influence of Chinese culture.

Keywords: ChatGPT, Chinese culture, inheritance and dissemination, innovation, media interaction

1. Introduction

Following its launch by OpenAI in 2022, ChatGPT, a conversational artificial intelligence (AI) system, ignited a wave in the realm of generative AI and triggered widespread attention and fervent discussions across various sectors of society. In the backdrop of the digital era, the emergence and advancement of ChatGPT as a novel content tool and information medium have introduced fresh perspectives for the inheritance, dissemination, and innovation of Chinese culture, while simultaneously presenting new challenges. This paper will employ classical theories of cultural communication to expound and analyze, from multiple perspectives, the opportunities and challenges that ChatGPT brings to the inheritance, dissemination, and innovation of Chinese culture, and will propose corresponding strategies.

2. Characteristics of ChatGPT as a Natural Language Processing Model

As a specific application of the GPT model, ChatGPT is a natural language processing model based on deep learning. Through extensive pre-training and fine-tuning methods, it is capable of generating text responses in conversations with users, demonstrating a certain level of context comprehension and proficiency in generating text across multiple languages.

ChatGPT encompasses features such as language encoding and decoding, contextual awareness, and multi-domain knowledge generation. It finds application in various scenarios, including human-

machine interactive dialogues, information retrieval through question-answering, providing suggestions, and aiding in creative endeavors. Nevertheless, since ChatGPT's language learning and generation are rooted in statistical models and textual data, it lacks true consciousness, understanding, and reasoning abilities. As a result, ChatGPT possesses limitations including constrained output, potential biases, inadequate emotional comprehension and expression, susceptibility to adversarial attacks, and potential for misuse. When employing this model for cultural inheritance, dissemination, and innovation, it's essential to recognize its impact and implications, and to seek appropriate measures to address these limitations.

3. Opportunities Brought by ChatGPT to the Inheritance, Dissemination, and Innovation of Chinese Culture

The inheritance, dissemination, and innovation of Chinese culture are closely intertwined with media. ChatGPT, with its knowledge storage, information integration, and content generation capabilities, enhances the efficiency and coverage of the transmission of Chinese culture. It also increases the potential for personalized education and learning of Chinese culture, promotes proactive cultural innovation, and introduces new opportunities for the contemporary propagation and storytelling of Chinese culture.

3.1. Advancing Mass Accessibility of Cultural Inheritance, Dissemination, and Innovation Through Technological Innovation

In the digital age, the internet, as a medium with low entry barriers and high information volume, has become a significant channel for information acquisition. Chinese culture, rooted in the practices and creations of the masses, inherently possesses a mass-oriented attribute. However, the objective environments and social contexts on which different periods of Chinese culture rely vary significantly. The historical understanding and inheritance of Chinese culture in today's society cannot be experienced firsthand within the context of its original era. Hence, participants require a certain level of educational and experiential background.

Cultural inheritance, dissemination, and innovation in Chinese culture are often achieved through methods such as curriculum teaching, historical document reading, and participatory reenactment. Yet, these activities are limited in scale and audience reach due to intrinsic factors and external conditions. ChatGPT, as an AI model based on internet platforms, transcends temporal and spatial limitations, offering an intelligent and convenient interactive mode and an abundant educational resource for the transmission and innovation of Chinese culture. Furthermore, ChatGPT, functioning as an "extension of human beings," [1] expands the capacity and scope of human interaction with the world. It extends the users' visual and cognitive senses, aiding them in comprehending Chinese cultural knowledge from diverse fields and perspectives, thereby enhancing the efficiency of their cultural learning.

3.2. Personalized Services Enhancing the Capacity and Potential for Effective Storytelling

Embedded within the internet, ChatGPT manifests a "long tail effect" [2] in information exchange and propagation. This entails the coexistence of mass-oriented communication (the "head") and niche, personalized communication (the "tail"). The mainstream content demand aligns with the specialized and individualized content needs. Users engage in real-time dialogue with ChatGPT through human-computer interaction, posing questions, expressing opinions, and sharing feedback. ChatGPT responds and adapts in real time based on user inputs, delivering more personalized and targeted narrative explanations. This interactivity heightens users' engagement and interest as active participants, aiding them in comprehending the essence of Chinese culture.

ChatGPT can be customized based on individual needs and interests. By analyzing users' search histories, browsing records, and interaction data, ChatGPT can discern specific requirements concerning Chinese culture. This includes cultural preferences, content preferences, and the depth and breadth of their interests. With this information, ChatGPT can create customized, personalized text-based interaction scenarios for users, catering to niche and non-mainstream information needs. This approach fully harnesses the active engagement of recipients in the dissemination and reception of Chinese culture. Additionally, ChatGPT's question-and-answer mode supports heuristic education and provides information assistance, diverse perspectives, and inspiration for innovating Chinese cultural content and communication methods.

4. Challenges Brought by ChatGPT to the Inheritance, Dissemination, and Innovation of Chinese Culture

Every technology comes with its drawbacks and limitations. While providing convenience and assistance, it can also introduce certain harms and challenges. ChatGPT, as an artificial intelligence technology, is restricted by training data and algorithmic capabilities. It lacks autonomous thinking, value judgment, and emotional understanding, rendering it unable to fully comprehend the essence and values of Chinese culture. This poses challenges to the cultural content, agents, and implementation methods in the processes of inheriting, disseminating, and innovating Chinese culture.

4.1. Impact of Information Pollution on Cultural Identity and Cohesion

Firstly, the reliability of information sources in ChatGPT varies, and its information selection and filtering mechanisms are imperfect. ChatGPT's diverse knowledge stems from a wealth of internet information, much of which includes varying degrees of false and misleading information, creating information noise in its learning and interactions. Secondly, ChatGPT's content generation is characterized by randomness and inaccuracy, making it prone to misleading users during cultural transmission. Additionally, ChatGPT's interactive responses are rooted in the given prompts by users. In this scenario, the authenticity and accuracy of Chinese cultural content could be compromised, leading to biased interaction-based communication generated by ChatGPT.

Numerous fictitious creations using Chinese cultural symbols exist on the internet, particularly in the realm of the arts. Consider Lu Xun's novel "The Divorce," first published in 1925. When a user seeks to understand the plot of this novel, they may use the author's name "Lu Xun" and the novel's title "The Divorce" as a prompt. Since this novel is relatively less well-known compared to works like "Diary of a Madman," information about it on the internet might be scarce, leading to inaccuracies in the content generated by ChatGPT. Users might question these inaccuracies, but ChatGPT, limited by its learning resources, may not provide accurate descriptions. It might even continue to produce incorrect responses. When ChatGPT responds to inquiries related to Chinese culture, it could be influenced by information distortions, leading to biases and deviations. This dilutes the value and significance of Chinese culture during the process of information propagation, hindering the continuity of Chinese cultural value identification and enhancing cultural recognition.

The unreliability of content generated by ChatGPT may impact the historical authenticity of Chinese cultural inheritance. As a tool, ChatGPT is not bound by legal and ethical constraints. The inaccurate and unreliable textual content it produces due to technical limitations can result in erroneous pairings of historical figures and events, as well as biased responses based on partial facts and prejudiced information. This misalignment in its presentation of Chinese cultural education, historical event characterization, and mainstream Chinese values challenges the objective authenticity of history and weakens historical memory and cultural identification.

ChatGPT's susceptibility to information pollution, to some extent, exacerbates the problem of

information pollution and hinders the development of a green media ecosystem that enhances Chinese cultural identity and cohesion. Chinese culture is essentially a reflection of the dynamic interaction between the masses and the objective world, inherently possessing value scales and biases. However, as an artificial intelligence, ChatGPT lacks the capability to think and possess consciousness, preventing it from generating text content based on the value stance of mass information sources. Consequently, it could inadvertently facilitate the spread of harmful information and incite inflammatory speech, subjecting relevant entities to cognitive persecution. This poses a severe challenge to the media environment for the inheritance and dissemination of Chinese culture. Chinese culture is vibrant, with its content evolving and being updated in accordance with the developments in the objective world. Outdated or incorrect content gets discarded, excluded from the processes of cultural inheritance, dissemination, and innovation. Yet, ChatGPT's internet information sources can contain outdated and invalid information, potentially affecting users' accurate understanding of Chinese cultural content.

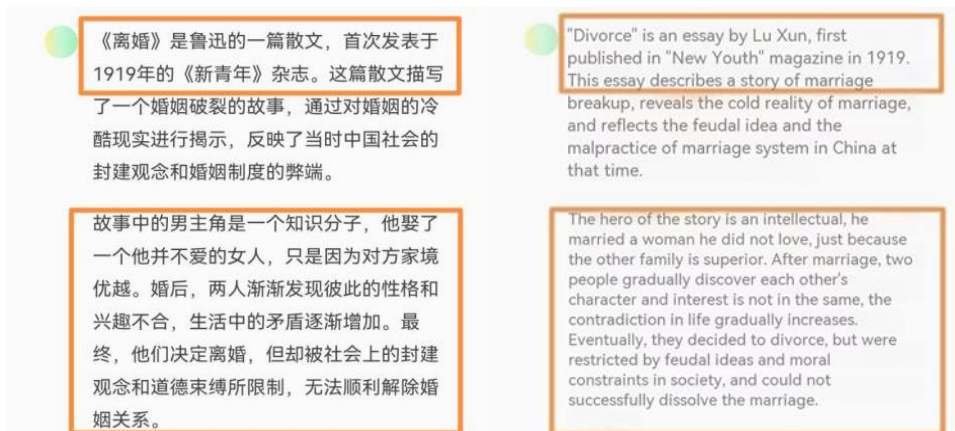


Figure 1: ChatGPT's response, generated based on the prompt "Lu Xun's 'The Divorce'," is inconsistent with the truth.



Figure 2: ChatGPT's response when further inquiring about the content related to "Lu Xun's 'The Divorce'" is inconsistent with the truth, based on the information in Figure 1.

4.2. Information Distortion Diminishing the Precision and Breadth of Chinese Cultural Inheritance and Dissemination

Interactive communication through ChatGPT can result in the information-based symbolization of Chinese cultural content. Stuart Hall posits that meaning needs to be achieved through a naturalized encoding that harbors concealed meaning. ChatGPT, as a medium, plays a role in carrying and

delivering meaning. In the process of engaging in interactions related to Chinese cultural content with ChatGPT, cultural content undergoes learning and encoding of meaning by ChatGPT before it is output as a response. This response then requires “decoding,” or interpretation of meaning, by users as the audience. During the dissemination process based on ChatGPT, the multi-layered and complex content of Chinese culture gets symbolized, with its integrity fragmented through the process of information distortion. This can lead to a partial loss, deformation, or distortion of the original meaning, resulting in the diminishment of precision and depth within Chinese culture. Furthermore, due to the limitations of ChatGPT’s training data and algorithms, it might overlook the details and nuances of Chinese cultural inheritance and dissemination, failing to meet users’ precise demands for Chinese cultural transmission and dissemination. Additionally, the audience involved in cultural inheritance and dissemination practices varies in terms of linguistic-cultural background and knowledge level. However, ChatGPT’s knowledge acquisition process is not influenced by cultural interactions but solely by information sources. The text-based language generated through human-computer interaction by ChatGPT cannot be designed in real-time to cater to the unique needs and different backgrounds of its recipients. As a result, the feasibility and effectiveness of the recipients’ decoding and reception are significantly compromised. This poses challenges to achieving cross-cultural communication of Chinese culture.

ChatGPT can lead to the narrowing and polarization of individual information reception in the context of Chinese cultural inheritance and dissemination. The existence of internet information overload, personalized recommendation algorithms, and the limited nature of individual information needs make individuals susceptible to what is termed the “echo chamber,” [3] where they only encounter and select information and subjects that align with their interests [4]. ChatGPT, as a personalized recommendation and interaction tool, also faces similar issues. The question-and-answer feature of ChatGPT makes personalized information services in the digital age a reality. In the process of Chinese cultural inheritance, innovation, and storytelling, the phenomenon of “The Daily Me” [5] customization, based on ChatGPT, becomes more pronounced. Due to factors such as platform algorithms, user demands, and prompts, ChatGPT often tends to recommend and generate viewpoints that align with the user’s needs and interests, while neglecting other aspects and dimensions of content. Consequently, the Chinese culture that audiences come into contact with lacks diversity and comprehensiveness, and they may even become trapped in a mistaken cognitive “echo chamber.” This hinders users’ comprehensive and in-depth understanding of Chinese culture, as well as the innovative creativity of Chinese culture.

4.3. Media Function Solidifying the Cognitive Dimensions of Cultural Inheritance, Dissemination, and Innovation

According to Herbert Marcuse, modern society exhibits the closure of the discourse field and the problem of one-dimensionality in thought and lifestyle [6]. “The purging of two-dimensional culture... was achieved by incorporating them into the established order and extensively reproducing and displaying them.” [6] ChatGPT cannot truly comprehend the context and core essence of cultural inheritance, dissemination, and innovation. Its responses are mere mechanical encoding and massive replication of learned knowledge, lacking genuine innovation and diversity of thought [6]. Therefore, communication based on ChatGPT hinders the “genuine development of meaning” within Chinese culture and results in relatively singular viewpoints expressed through various text formulations during conversations with ChatGPT. This restricts the breadth and depth of cultural subject thinking.

As an AI dialogue model, ChatGPT’s efficiency in content generation and convenience in retrieval can lead users to develop psychological and cognitive dependencies on it. As a result, subjects who were once active learners in educational activities become passive recipients, transforming into “one-dimensional people” with fixed mindsets. This hampers the formation of critical consciousness and

diverse thinking during the process of Chinese cultural reception and inhibits the ability to sift through and extract the essence in cultural inheritance and dissemination.

Due to ChatGPT's training data and model bias toward certain viewpoints and information sources, it may be influenced by the closure of the discourse field when answering questions related to Chinese culture. Consequently, when people engage in Chinese cultural interactions through ChatGPT, they are exposed to specific viewpoints, exacerbating the solidification of cognitive patterns and group polarization among cultural subjects. This increased resistance to varying perspectives makes it more difficult for subjects to accept and propose new ideas and viewpoints in the context of cultural inheritance and dissemination.

When individuals perceive their viewpoints to be divergent from mainstream perspectives, they might opt to remain silent rather than express and propagate their opinions. In the process of interacting with ChatGPT, its algorithm-based responses often lean towards mainstream viewpoints. The content output that integrates mainstream perspectives might intensify audience silence, making the creation and dissemination of non-mainstream viewpoints more challenging. Taking the classic novel "Dream of the Red Chamber" as an example, there is ongoing controversy about the authorship of the final forty chapters. However, ChatGPT often provides the mainstream viewpoint that attributes them to Gao E, while ignoring other voices. Innovation often emerges from the clash of viewpoints, novel perspectives, questioning, and inquiry. A state of silence hinders Chinese cultural subjects from breaking free from entrenched thought patterns and cultural viewpoints, consequently impeding the drive for innovative development within Chinese culture.

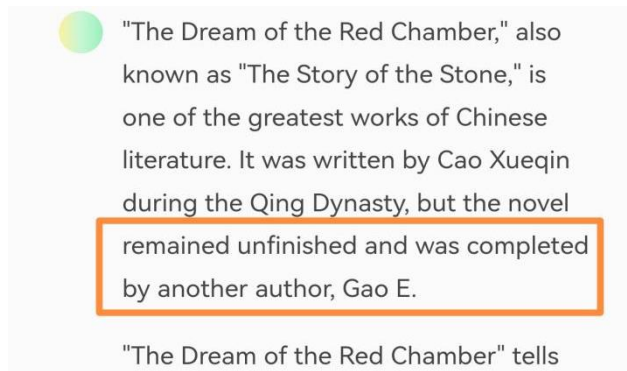


Figure 3: ChatGPT's response based on the prompt "The Dream of the Red Chamber".

4.4. Absence of Emotion Diminishes the Persuasiveness and Empathy of Cultural Content and Innovation

As an intelligent dialogue model, ChatGPT transforms the communication process from "human-to-human" to "human-to-machine-to-human." The Chinese cultural content generated lacks value orientation and emotional focus, remaining at the superficial level of mechanical encoding of information. Lacking subjective consciousness and empathetic ability, ChatGPT cannot persuade or appeal to emotions as humans do, making it difficult to grasp the emotional warmth of human language systems and the underlying value scales embedded in Chinese cultural content. This causes Chinese cultural transmission and dissemination activities based on ChatGPT to lose the language charm of narrative communication and the universal values that touch hearts.

Taking poetry as an example, poetic language is a distillation and concentration of meaning. It not only conveys literal meanings but also encapsulates cultural traditions and "meanings beyond words." However, ChatGPT often captures only surface or commonly used meanings, failing to understand and convey the profound implications and nuances of special usages, and it lacks the ability to actively engage in aesthetic practices that respond to the imagery created. For instance, in the case of the

imagery of “yellow flowers,” ChatGPT cannot create emotionally resonant verses like “People are thinner than yellow flowers” or “Piles of yellow flowers covering the ground.” Additionally, ChatGPT’s tendency to generate knowledge-based fast food content undermines the rich imagery and emotional depth of Chinese culture itself, subsequently affecting the perception and trust of both the subjects and the audience. Chinese cultural inheritance, innovation, and storytelling involve valuable interactions with emotions and warmth. The absence of emotion in ChatGPT is bound to reduce the persuasiveness and affinity of Chinese cultural content.

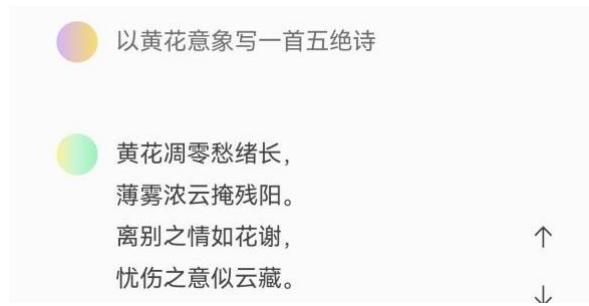


Figure 4: Poetic verses about “yellow flowers” created by ChatGPT.

5. Strategies for Chinese Cultural Heritage and Innovation Based on ChatGPT

Having identified the impacts and challenges posed by ChatGPT, it is essential to explore rational strategies for Chinese cultural heritage and innovation through the utilization of ChatGPT.

5.1. Enhancing Subject Competence: Elevating Critical Thinking as ChatGPT Users

Media is a tool that carries information and can influence individuals’ thinking patterns and abilities [7]. ChatGPT’s memory, computation, and learning capabilities surpass human capabilities, making it an extension of the human mind. It assists individuals in cultural learning, information organization, and real-time question answering. With its aid, people need not possess all-encompassing knowledge of Chinese culture, but they should have the ability to ask questions, navigate AI, exercise high information discernment, and exhibit critical awareness. This necessitates educational efforts to elevate individuals’ capacity and competence in employing ChatGPT for Chinese cultural heritage and dissemination.

There exists a mutual influence and training process between ChatGPT and user subjects. As individuals, the bearers of Chinese cultural heritage and dissemination, they must utilize their unique cognitive abilities and subjective agency to enhance their capability to resist undue training, improve their discernment of the authenticity of Chinese cultural text generated by ChatGPT, and develop content-critical awareness.

Contents that stigmatize Chinese culture, cultural detritus, linguistic traps, erroneous historical perspectives, and value-laden information can be embedded within ChatGPT, subtly influencing the process of Chinese cultural heritage and dissemination. In the context of de-personalized interactions with ChatGPT, the multitude of cultural and informational variables becomes more complex and unpredictable. Consequently, as inheritors of Chinese culture and promoters of cultural transmission, individuals must cultivate accurate values, cultural perspectives, historical viewpoints, empathy-based judgment, information integration skills, and a deep understanding of ChatGPT’s operational logic and dissemination patterns. This will enable them to effectively curate high-quality Chinese cultural content and information during the process of heritage and innovation.

5.2. Algorithmic Resources: Thorough Exploration and Value-oriented Control of Chinese Culture

Strengthening the review and supervision of content generated by ChatGPT is essential to address its emotional and value deficiencies. Technology itself is devoid of a value stance, yet those who wield it do possess such stances. “The ideological embedding of ChatGPT is inherent in its content generation pattern and operational rules, influenced by a variety of factors including power, capital, culture, and values.” [8] Furthermore, the information sources of ChatGPT are influenced by human subjective thinking and hold certain perspectives and biases. To ensure the right direction of ChatGPT’s algorithmic cultural resources and to enhance content review and legal supervision, we need to infuse the guidance of Chinese cultural values and a shared national identity into ChatGPT’s models and rules, seize the initiative and leadership in public opinion, and persist in correct algorithmic culture resource development. Additionally, relevant scholars can independently develop and practice algorithms based on the current logic of ChatGPT’s natural language model.

Optimizing ChatGPT’s data, algorithms, and computational power is crucial for comprehensive and in-depth exploration of Chinese cultural connotations and values. Data related to Chinese culture that ChatGPT learns from may contain inaccuracies or biases, hence we must ensure accuracy, objectivity, and comprehensiveness through careful data selection. In terms of domestic Chinese cultural heritage and dissemination, efforts can be made to advance the construction of digital resource infrastructure nationwide, achieving a systemic and balanced structure of Chinese cultural data resources for ChatGPT within the country. This would help reduce the “digital divide,” minimizing barriers in Chinese cultural heritage and innovation. Simultaneously, the state should ensure advanced computational power and algorithms to guarantee that model training and technological resources of ChatGPT are controlled by the people and the subjects of Chinese cultural heritage and dissemination. This will facilitate comprehensive and in-depth processing and understanding of the Chinese language within the model.

5.3. Innovative Approaches: Leveraging ChatGPT to Seize Control over Cultural Heritage and Innovation

Proactively guiding ChatGPT to comprehensively present and disseminate outstanding Chinese culture. Due to the “long-tail effect,” a few popular and highly influential aspects of Chinese culture may dominate the attention of the majority, while more niche cultural elements could remain obscure. Thus, when utilizing ChatGPT to drive Chinese cultural heritage and innovation, we need to exercise control in the initial stages through programming, data selection, and interactive prompt guidance. By actively training and pre-setting ChatGPT to some extent, we can reduce its information bias and search sensitivity, ensuring that the diversity of Chinese culture is equally well-presented and propagated alongside popular content.

Effectively using ChatGPT for Chinese cultural education and instructional design. ChatGPT possesses robust capabilities in information integration, text-based interactions, and content generation, making it applicable to various aspects of cultural heritage and human education activities. It can be employed to summarize Chinese cultural knowledge, generate plans for cultural heritage activities, create textual contexts for Chinese cultural communication, and simulate the process of cultural dissemination. Additionally, users can harness their creative and proactive thinking by engaging in personalized conversations with ChatGPT. By expressing explicit text content generation requirements through active interactions, users can seek inspiration and ideas for innovative Chinese cultural content, utilizing ChatGPT to aid in cultural innovation and creative practices.

5.4. Interaction Process: Enhancing the Validity of Cross-cultural Communication and Dissemination on the ChatGPT Platform

According to Mead's theory of "I" and "Me," an individual's ideology and experiences influence their understanding and acceptance of information. When users engage in conversations with ChatGPT, their individual characteristics and backgrounds may affect their comprehension and acceptance of Chinese culture. For instance, individuals whose native language is not Chinese might struggle to fully grasp the symbolic meanings in Chinese language and literature, requiring translation to facilitate meaningful interaction. Similarly, those who haven't lived in the Guangdong region might struggle to emotionally connect with the cultural sentiments conveyed through Cantonese opera. To effectively tell Chinese stories and achieve meaningful cultural heritage and dissemination, we need to leverage the ChatGPT platform for meaningful interactions within symbolic social contexts. Exploring the integration of ChatGPT with other media forms for Chinese cultural dissemination becomes crucial, expanding the space for meaning between cultural propagators and recipients. This fosters effective exchanges of meaning, understanding, and collisions of responses. Furthermore, it's important to consider individual user needs and cultural background differences. By understanding the audience's information decoding process through contextual language and user feedback, we can timely optimize algorithms and data resources. This optimization aims to provide information that is more comprehensible and acceptable to users, delivering content that is enjoyable and relatable. This approach facilitates effective communication and symbolic interaction of culture within the ChatGPT platform, enhancing the allure and impact of Chinese culture.

6. Conclusions

In the context of the digital era, the advancement of AI-powered generative content technology has transformed ChatGPT into a new medium and force driving innovative cultural heritage and storytelling for Chinese culture. Simultaneously, addressing the challenges posed by ChatGPT requires a deep exploration of the essence and values of Chinese culture. It involves supervising and auditing the information generated by ChatGPT, enhancing the critical thinking and creativity of relevant stakeholders, innovating the integration of Chinese culture with ChatGPT technology, and strengthening effective communication and dissemination. Research on the integration of ChatGPT in the transmission and innovation of Chinese culture is conducive to promoting creative transformation and innovative development of Chinese culture in the digital age. This in turn facilitates the telling of compelling Chinese stories, elevates the cultural self-confidence of the Chinese nation, and enhances the international influence of Chinese culture.

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Appendix

The ChatGPT tool links used in the examples mentioned in this article are as follows:
<https://ai.ai4ed.cc>, password: 8152569f20453742dda9c0d3ddc43bfb.