

Digital Humanities and Cultural Identification of Prefecture-Level Cities in China and Sustainable Development: A 3-Year Empirical Study (2021-2023) on Digital-Based Literary Narration in Short Videos

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Abstract: The advent of technology has revolutionized the methods by which modern citizens access information and engage in literary narration (through storytelling), transforming it into a multidimensional and intricately interwoven tapestry that encompasses various disciplines such as communications and media. As an exciting frontier of study, numerous scholars are dedicated to theoretical analyses within the realm of digital humanities, presenting vast opportunities for its practical application. This article explores the digital transformation of literary narration within the realm of short videos, which not only serves as a primary means of acquiring information (which engages with a large amount of demographic information) but also facilitates cultural identification with prefecture-level cities in China. The major cities enjoy the “say” in the media landscape; hence, seeking outlets in short videos (which do not need advanced infrastructure) serves as a “life-saving straw” for prefecture-level cities. The dominance of short videos in terms of extensive coverage surpasses that of print media, television, and other traditional media. This new form of literary narration incorporates elements such as pictures, animations, sound effects, and catering to diverse audience preferences and features the grand vitality of digital humanities. This article conducts comprehensive research from 2021 to 2023, aiming to unveil an innovative approach for the cultural identification of prefecture-level cities and the effectiveness of digital humanities applications with regard to literary transformation in the era of short video. Moreover, it endeavors to capture precise data directly from local residents, thereby assessing the efficacy of technology-based literary narration in short video creation and dissemination. Ultimately, these efforts aim to fortify the construction of prefecture-level cities against the challenges posed by metropolises. After 3 years of the experiment, we found that digitally transformed literary narration in short video helps the cultural identification of prefecture-level cities and brings cohesion to their citizens. Therefore, the survival of prefecture-level cities in China necessitates the “snatch” of opportunity for this new form of literary narration and sheds light on the further application of digital humanities.

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1. Introduction

The advancement of technology has transformed narrative practices, as a significant proportion of Chinese individuals now prefer to engage with multimedia platforms such as films, TV series, and short videos when sharing their stories [501-3]. Technology advancement and social trends (the greatest demographics are not readers but rather viewers) give rise to the digital humanities, as portrayed in the following quote: “Currently, the digital humanities are poised to make the jump from a niche field to a field-of-fields

seen to affect research and teaching throughout the mainstream humanities" [4]. The application of literary narration cannot be traditional as it is in print media; rather, literary narration can be converted to digital-based narration to fit into new carriers such as multimedia. Previous research indicates that short videos have emerged as the predominant medium for disseminating narratives in the current media landscape in China, which has transformed literary narration [5-7]. With the assistance of the AI algorithm, short videos can not only be distributed to "designated denizens" [8-10] to better enhance the efficiency of digitally based narration in short videos [11]. The literary narration of local stories can be transformed into digital stories and can facilitate the cultural identification of prefecture-level cities in China. Conspicuously witnessed via recent population flows, the siphoning effect of metropolises in China has continued for many years [12-15]; therefore, more denizens are attracted to metropolises and cannot find their attachment to the prefecture-level cities where they are born.

The presentation of local culture and culturally rich narratives enhances residents' sense of cultural identification, while literary narration contains the most profound "connotation of the local cultural dynamics", so transforming literary narration into a "multimedia" approach in short videos will work [5-7]. Therefore, grasping the essence of local culture and effectively disseminating it can enhance residents' psychological recognition and cultural identification. These large cities siphon the flow of population from prefecture-level cities due to their "unique charisma" [16-18], and this population seeks cultural identity in large cities [19], which "jeopardizes" the cultural identification of prefecture-level cities. For instance, the top 10 cities with the greatest population growth in 2022 are Changsha, Hangzhou, Hefei, Xi'an, Guiyang, Nanchang, Kunming, Wuhan, Zhengzhou and Qingdao (<https://baijiahao.baidu.com/s?id=1766100802331819162&wfr=spider&for=pc>, accessed on June 29, 2023), as shown in **Table 1**:

Table 1. The Number of Population and Increments of the Top 10 Cities in China

Cities	The Number of Population in 2021 (Million)	The Number of Population in 2022 (Million)	Increment (Thousand)
Changsha	10.2393	10.4206	181.3
Hangzhou	12.204	12.376	172
Hefei	9.465	9.634	169
Xi'an	12.873	12.9959	122.9
Guiyang	6.1023	6.2204	118.1
Nanchang	6.4375	6.5381	100.6
Kunming	8.502	8.6	98
Wuhan	13.6489	13.739	90.1
Zhengzhou	12.742	12.828	86
Qingdao	10.2567	10.3421	85.4

According to China's urban hierarchy, first- and second-tier cities reign supreme in terms of economy, society, culture, politics, education, infrastructure and beyond, and they possess a formidable capacity to attract the majority of residents from prefecture-level cities [16-18]. In addition, denizens of prefecture-level cities exhibit a deficient sense of cultural identity and have been woefully uninformed of local economic and social progress in recent years. In the new era of short videos, what is even more concerning is that due to the absolute dominance of "say" in metropolises, residents of prefecture-level cities have developed a cultural and identity complex toward these metropolises [19], believing themselves to be part of them. Therefore, it has become imperative for each prefecture-level city to prioritize its cultural construction efforts to align with the evolving demands of contemporary society. To achieve soft power promotion at the national level, attention

should be devoted to the promotion of cultural soft power [20] in more than 300 prefecture-level cities, and the advancement of cultural undertakings and industries in prefecture-level cities should be promoted. In the contemporary era, internet-based short videos have emerged as the predominant medium for information dissemination, supplanting traditional print media with mobile network terminal TV media and fixed network terminals to become the new favorite [10], which is popular throughout society because of its short time span and overwhelming charisma, especially among young people [21-23]. Therefore, the extent of its dissemination coverage is inherently evident; however, it is only when the cultural essence of the prefecture-level city gains recognition or admiration from its future "fresh troops" (i.e., young individuals) that they will confidently propagate and promote their place of residence [24-26]. Therefore, the digital transformation of literary narration serves as the answer to the shift, and the local stories are being told in such an elegant way that the cultural identity also grows.

2. The Traditional Literary Narration and Digital-Based Literary Narration in Short Videos

Literary narration can be perceived as the art of weaving tales and conveying sentiments and concepts through eloquent depictions in literary works [27]. This narrative typically encompasses a cast of characters, an intricate plotline, a vivid setting, and other essential elements that are deftly interwoven to transport readers into the captivating world crafted by the author [28,29], where they can experience a gamut of emotions, conflicts, and character development. With the blessing of technology and the development of other disciplines, literary studies and practice (including literary narration) should not be grounded within their own field but should embrace and interweave with other disciplines (such as digital humanities) to outperform the "traditional self" in the modern era:

Literary studies are becoming more interdisciplinary and comparative with innovative ideas and methods. Through collaborative teamwork, digital humanities scholarships engage humanists, technicians, librarians, information experts, artists, and other personnel [30]. Collaboratively, they identify and address new problems by coding and analyzing new data. Such collaboration is very much in line with the *modus operandi* of the contemporary world. This new *modus operandi* of digital humanities should be encouraged and embraced [31].

The literary narrative gained brand new vitality after embracing digitization in the modern period, and the transformation made it more compatible with the new information acquisition habits of citizens. Digital-based literary rotation has been explored by many scholars as the use of digital technology and platforms to create literary narratives [32]. This includes using digital tools such as video games, virtual reality, and interactive fiction to tell stories. Digital-based literary narration often involves a mix of traditional storytelling elements with digitally created worlds and characters [33]. It allows for new ways of experiencing literature and can be a powerful tool for exploring complex themes and ideas [34]. The difference between traditional literary narration in books and digitally based literary narration in short videos lies in their form, content, and presentation: (1) Form: Literary narration in books is typically presented in a written format, while literary narration in short video is presented in a visual format. This means that literary narration in short video focuses on capturing the essence of the story through visuals and sound [32]. (2) Content: Literary narration in books can cover a wide range of topics and themes, from classic literature to contemporary works. In contrast, literary narration in short videos tends to focus on specific stories or genres [33], such as romance, horror or comedy. Additionally, literary narration in short video may include commentary or analysis from the narrator, which is not common in books. (3) Presentation: Literary narration in books can be read at any time and pace, allowing readers to take their time with each chapter or section. Literary narration in short videos, on the other hand, must be watched in one sitting position, often within a few minutes [15]. This means that literary narration in short

videos must be concise and engaging to capture the viewer's attention. The use of short videos as a technological tool for storytelling not only revolutionizes the narrative approach employed in literary works but also facilitates the visualization of the story's "landscape," thereby enhancing the efficient transmission of local culture within a limited timeframe.

Moreover, the audience coverage between short videos and print media varies widely, which facilitates the "performance" of literary narration in such a digital form in short videos. The "China internet Audiovisual Development Research Report (2023)", known as the vane of China's internet audiovisual industry, was released in Chengdu. According to the report, the number of short video users in China has surpassed 1 billion and has permeated various segments of internet users. Additionally, the number of online live broadcast users has reached 751 million. As a leader in the short video industry, TikTok's monthly active data for this year exceeded 600 million. According to statistics, the average individual indulges in TikTok 23 times a day, with daily usage spanning over 110 minutes. According to the latest data, TikTok's user database is projected to reach approximately 842 million by 2022, with over 700 million active users on a daily basis. At the beginning of this year, the number of monthly active search users had already surpassed an impressive figure of 550 million, boasting rapid growth rates and prolonged online presence coupled with high levels of engagement—brands can anticipate optimal exposure (<http://news.jingji.net/news/2023/0404/10692.html>, accessed on June 29, 2023). Honestly, studies of digital humanities have been pinned on the theoretical realm, and many scholars express their concerns about the doom of traditional humanities; however, digital transformation not only updates the construct of traditional humanities but also assists in overcoming the dilemmas of "theoretical super & practical lame" and "make some noise" on the stage of implication [27], such as digitally based literary narration in short video. Overall, digitally based literary narration in short videos can be perceived as the use of digital technology and storytelling techniques to create engaging and immersive short videos. These videos often combine traditional storytelling elements with visual effects, animations, and interactive elements to create a captivating narrative that draws viewers [23]. They can take many forms, from animated short films to live-action videos with interactive elements [27], and are often used to tell stories in new and innovative ways. The goal is to create a compelling story that engages the viewer and keeps them invested in the narrative until the end.

3. The Research Gap and Cultural Identity of Prefecture-Level Cities in the Era of Short Videos

The impact of short videos on the cultural identification and dissemination of cities in the modern era has garnered significant attention [22-23]. For instance, Lian Tonghui and Gao Jianlin conducted an analysis using Nanjing as a case study to examine the strengths and weaknesses of urban cultural communication via digitally based literary narration in short video. The authors highlighted that while Nanjing possesses a rich cultural heritage and initial position for cultural construction, it faces challenges regarding insufficient cultural publicity because the level of cultural communication and the manner of narrating the local story of a city directly affect the visibility and reputation of the city's image. Qin Wenjing and Ji Yuhan analyzed the early preparation, mid-term operation and later feedback of Xi'an's local culture/folklore (cultural construction) on the TikTok platform [25]. Zhong Huxing discussed the significance of cultural communication in Wuhan (as a nation-level central city) in short video to improve cultural self-confidence, enhance urban cultural temperament, grow cultural belonging and drive cultural consumption forward [26].

Ironically, the "cultural exposure" of prefecture-level cities has been overshadowed by the narration of large cities in mainstream media [34-37] and we-media as well as academic papers that predominantly focus on exploring and studying large cities. However,

research on the culture and image of prefecture-level cities remains significantly overlooked. On July 3, 2023, the author conducted a comprehensive search on CNKI using the keywords "urban culture" and "urban development", while simultaneously meticulously selecting 100 thematically relevant papers spanning a period of five years (with an impressive impact factor), as depicted in **Table 2** (top GDP cities in China):

Table 2. The Distribution of the Top GDP Cities in China

Cities	Number of Articles	Cities	Number of Articles	Cities	Number of Articles
1.Shanghai	10	8.Hangzhou	2	15.Wuxi	1
2.Beijing	11	9.Nanjing	2	16.Zhengzhou	2
3.Shenzhen	8	10.Wuhan	5	17.Foshan	1
4.Guangzhou	8	11.Tianjin	2	18.Nantong	1
5.Chongqing	3	12.Ningbo	1	19.Jinan	2
6.Suzhou	2	13.Qingdao	1	20.Xi'an	4
7.Chengdu	3	14.Changsha	5	Other Cities	26

The top 20 cities in terms of GDP still wield "the lion's share" of social influence; thus, delving into the "cultural aphasia" of prefecture-level cities holds both practical and academic significance to fend off the social influence from large cities: it offers insights for over 300 such prefecture-level cities on how to narrate their own stories and disseminate. After all, a city's GDP often serves as a barometer for its economic development, and cities with superior economic development [37-39] are more inclined to undertake the cultural construction of the city through this particular literary narration in currently the most popular propagation medium, and culture can propel the local economy forward, which is beyond doubt. The correlation between economic development and culture in prefecture-level cities is mutually beneficial. Currently, social and economic progress increasingly relies on cultural identity and advancement [35-37], which constitute a significant trend in economic growth. The distinctive culture of prefecture-level cities plays a crucial role in enhancing cultural identity [40-42], attracting fellow citizens to return to their hometowns and driving regional economic growth. The symbiotic relationship between culture and economy fosters a virtuous cycle of constant coordination and improvement for these cities [43-46]. Culture has been intricately woven into the fabric of the economy, and as culture flourishes, so too does economic growth. Reckoning the exodus of the population toward metropolises and their monopolization of discourse, prefecture-level cities confront an arduous challenge in emancipating themselves from resource constraints. Numerous cities endeavor to allure inhabitants by creating a positive cultural identity of cities or by using strategies to build a better cultural image of the city to attract the flow-in of the population and to form new economic growth points to promote urban development. Despite the fact that large cities in China enjoy faster development and siphon off a myriad population from prefecture-level cities, prefecture-level cities have also established diverse professional institutions, including local universities, secondary schools, television stations at various levels, scientific research institutes, and local enterprises [47-49]. Moreover, the majority of prefecture-level cities still possess a substantial young population base that can actively participate in large-scale urban cultural narration. Most of the young denizens in prefecture-level cities have resided and received education within their respective locales for more than a decade but still harbor a profound sense of attachment to their hometowns and possess intimate knowledge of local history and culture. Furthermore, as these cities continue to develop, they are able to leverage both external publicity funds and local enterprise sponsorship while also capitalizing on the current trend toward short-form video content [49-52]. All these resources serve as the driving force for the sustainable development of prefecture-level cities in China [28]. Facilitating

digitally based literary narration helps the cultural identity and further benefits the economic growth of prefecture-level cities; therefore, placing greater emphasis on exploring the cultural identity of prefecture-level cities [17-19] will undoubtedly contribute to the development of 300 prefecture-level cities in China amidst the era of short videos, enabling them to thrive amidst the competition posed by major urban centers.

4. The Operating Model of Digital-Based Literary Narration in Short Video

The realm of technology extends beyond metropolises; prefecture-level cities possess the capacity to embrace certain forms of technology, thereby enriching their literary narrative [19]. This is because not all technological advancements necessitate high-end infrastructure, a privilege exclusive to larger urban centers. Prefecture-level cities enjoy their own official “media convergence” (mainly short videos) to boost their local culture efficiently and accurately by taking advantage of the AI algorithm, which has ultimately transformed how traditional print media narrates cities’ stories. (<https://baijia-hao.baidu.com/s?id=1686937890565460511&wfr=spider&for=pc>, accessed on June 30, 2023). Currently, all prefecture-level cities are catching up with the trend of “media convergence” (mainly short videos) to enhance digitally based literary narration and evoke a profound emotional connection among the inhabitants toward their abode and to encourage active participation. The AI algorithm empowers dissemination as well as locating recipients and collecting comments; therefore, it helps prefecture-level cities better understand preferences to “sharpen” digitally based literary narratives to cater to recipients. For this reason, the “media convergence” (mainly short videos) of prefecture-level cities is booming compared with ever, which is the “priority” for their market (<https://caifuhao.eastmoney.com/news/202208121607392630840>, accessed on June 30, 2023). Hence, the operating model (as well as the research model) is shown in **Figure 1**:

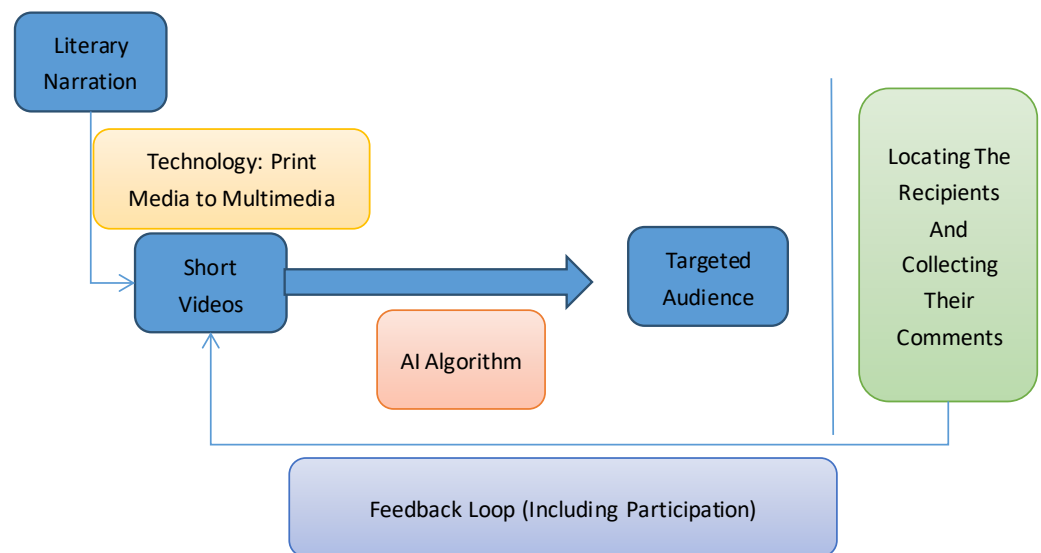


Figure 1. The operating model (as well as the research model)

5. Research Methodology

5.1. Research Hypothesis

H1: Digital-based literary narration in short videos will help build cultural identification in the psychological world of citizens in prefecture-level cities in China in a better way (efficiency and effectiveness) than traditional literary narration.

H2: Different age groups of citizens have different feedback on this new literary narration, which requires more targeted efforts to navigate the disadvantages and meet their psychological needs.

5.2. Procedures

Step 1: By collaborating with the local department of publicity, we launched a captivating short video competition in Shaoyang, a prefecture-level city in Hunan Province, China. This initiative aimed to ignite active participation among its esteemed denizens in 2021. By taking advantage of the AI algorithm, the most common “video invitation”, using the video platform Tiktok, was accurately sent to those active users who dwelled in the city. Furthermore, the works would be meticulously evaluated, and a generous bonus of over 100 thousand yuan would be distributed to those distinguished prize winners (sponsored by local brands).

To invite more active users from different categories, the AI algorithm enhanced the targeted distribution to different active users from different preferences and invited them to narrate local stories via short videos such as rural life, local cuisine, tourist attractions, education, history, and celebrities. Afterwards, the effectiveness of participation and results were analyzed to determine how much it improved the psychological identification of denizens and the efficacy of cultural buildup for prefecture-level cities.

Step 2: The departments of publicity and we-media collect all videos that narrate local stories with regard to history, culture, cuisine, city construction, etc., to the people nationwide on the Tiktok platform and collect their feedback or attitudes (informed consent will be chosen if participants are willing to respond) toward digitally based literary narration via short videos in 2022 (a questionnaire we used is a modified version from other studies in China).

Step 3: After taking the result of the short video competition assisted by the AI algorithm in 2021 and the statistics of the feedback of the targeted audience in 2022, we sorted all the information and used SPSS to analyze the statistics in 2023.

6. Digital-Based Literary Narration in Short-Video Competition in 2021

According to the official WeChat public account of Shaoyang, over 1000 entries were submitted for the first short video competition. All the local stories narrated in the short video, as a form of digital humanities, are presented “much more than the traditional literary narration” because of the pictures, background music, sound effect, special animation, etc., as shown in **Figure 2**:

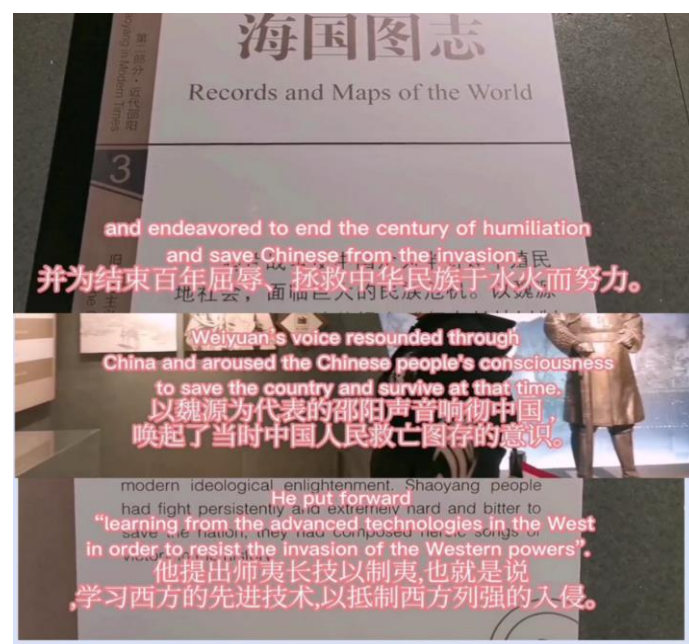


Figure 2. The Screenshot of Digital-Based Literary Narration in Short Video from One of the Short Videos in the Competition

Blessed by the advancement of technology, the traditional way of narrating local stories has become a more intriguing digital version that alters people's access to information [22-26]. According to the broader picture, this digitally based literary narration increases the cultural identity of citizens since they are able to immerse themselves in their own stories much more easily [11]. Furthermore, it not only facilitates the sustainable development of the economy but also enhances the vibrancy of the city in which these narratives unfold.

After careful consideration based on their digitally based literary narrative of the city's society, economy and history, etc. (cultural identification) and number of likes (dissemination), 48 works were selected as finalists (<https://mp.weixin.qq.com/s/1lMoM9POPwF6yVwsqE86tQ>, accessed on July 1, 2023). As illustrated in Table 3:

Table 3. Information on the 48 Finalists

Type	Number of Finalists	Representative Finalists' ID	The Number of Works of Representative Finalists
"Red" Shaoyang ("红色"邵阳)	7	Xiao Wuzi(小伍子)	2
Natural Scenery(自然风景)	9	Bu Qingyun(步青云)	2
Food Culture(美食文化)	13	Amei Xiaofang(阿妹小芳)	9
Local Humanity(人文民情)	13	Shan Yang(散阳)	3
The General(综合)	6	Carter Interpreting (Carter口译)	2

The aforementioned works, crafted by citizens who put all they can to embed pictures, audio, historical background, clips and so on into the literary narrative (digital humanities), served to elevate Shaoyang's visibility and reputation. They had ignited a fervor among its populace to construct cultural identity toward this city while disseminating the theme of aiding in Shaoyang's high-quality growth through accurate distribution assisted by AI algorithms on TikTok. Among them, 16 exceptional short videos were awarded (<https://mp.weixin.qq.com/s/FGYGjRlCn86t3tjhXdxWEg>, accessed on July 1, 2023). As shown in Figure 3:



Figure 3. The Distribution of Finalists with Regard to Different Themes

Judging from the award results, the greatest winners were the works of Food Culture, "Red" Shaoyang and Natural Scenery, which had been widely recognized by local people

and experts in terms of the popularity and overall quality of digital-based literary narration and were an important part of the cultural confidence and impressive dissemination of prefecture-level cities. Therefore, other prefecture-level cities should spare no efforts in “sharpening” digitally based literary narration to these important plates of food culture, “Red” Shaoyang and natural scenery, while they represent an integral part of cultural confidence and propagation in prefecture-level cities.

7. The Implementation and Survey of Digital-Based Literary Narration in 2022

After the success of the short-video competition, the municipal department of publicity launched “project 2022 - Beauty of City” to encourage and guide official short-video accounts and other V-loggers (including institutional short-video accounts and private short-video accounts) to take advantage of more advanced technology to further empower digitally based literary narration in an efficient and effective way. For instance, AI making in Capcut provides you with a large range of options to produce your own narrative in multiple media, including graphics, background music, sound effects, transitions and, most importantly, the way of narrating the story in such a multimedia realm while coordinating all elements to better produce a tech-enhanced literary narration that fits different groups of recipients [7]. During the course of one year, over 30 thousand captivating short videos were uploaded on TikTok in Shaoyang, a prefecture-level city, encompassing an array of diverse thematic categories. Moreover, the questionnaire (with different categories of themes according to their preference) was distributed accurately to those who were living in cities or born in cities but worked in other areas after the data analysis of the AI algorithm. Specifically, the AI algorithm in Tiktok sent the categories they liked via big data (what type of videos they frequently dwell on) and invited all recipients to fill out the questionnaire (there would be a bonus provided after completing the questionnaire such as.....).

At the end of 2022, there were 4574 valid responses to the questionnaire, and all of them were analyzed by SPSS to determine the effectiveness of the new narrative on the short video platform. As mentioned in the previous section, the questionnaire was adopted from a previous test that has been used by many scholars. The reliability test was implemented, and the results showed that the Cronbach’s alpha coefficient in this study was 0.897, which proved the reliability of the questionnaire. To acquire a more accurate response, different age groups, degrees of education, occupations, etc., were included, as **Table 4** indicates:

Table 4. Demographics of the Recipients

Number		Proportion Of Highest Diploma			
< 30	1660	671 College Degree/Junior College	511 High School/Technical Secondary College	463 Middle School	15 Less Than Middle School
30-45	1584	717 College Degree/Junior College	575 High School/Technical Secondary College	280 Middle School	12 Less Than Middle School
> 45	1330	411 College Degree/Junior College	559 High School/Technical Secondary College	310 Middle School	50 Less Than Middle School

First and foremost, the age distribution of the recipients was fairly even, which indicated that all age groups were inclined to be obsessed with short videos since short videos turned out to be the mainstream medium for denizens to obtain information. All the recipients of the questionnaire were filtered by an AI algorithm to reach the targeted audience. All the questionnaire feedback from the 3 groups collected by Tiktok (filtered by the AI algorithm to obtain more accurate data) was tested by ANOVA (one-way analysis of variance) via SPSS (the test of homogeneity of variances showed that sig. >.05, which further proved the liability of the test) to determine how the targeted audience (different age

groups) viewed the cultural construction of the prefecture-level cities with the assistance of digitally based literary narration in short video. As shown in **Table 5**:

Table 5. Q1

Group	N	Mean
1	1660	78.23
2	1584	80.97
3	1330	84.62
Total	4574	81.04

(I) Group	(J) Group	Sig.
1	2	.000
	3	.000
2	1	.000
	3	.000
3	1	.000
	2	.000

Test of Homogeneity of Variances. Sig. =.271

Do digitally based literary narrations in short videos help you better understand the city and the strength or merit of the city in particular? (10 relevant questions are included in the category)

Conspicuously, the means of the 3 groups positively indicate a supportive view (mean > 50) of the performance or efficacy of digitally based literary narration in short videos with regard to propagating the city. In particular, 3 groups have significant differences (sig. <.05), which indicates that the older the age is, the more supportive the denizens will be (84.62>80.97>78.23). The primary reason lies in the fact that senior groups are particularly captivated by this relatively novel form of digital-based literary narration in short video; however, younger groups have already been exposed to this new media narrative style for a comparatively longer duration. Consequently, more videos have been disseminated among senior groups and garnered greater appreciation from them, as per the data analysis conducted on TikTok (the comments and responses from senior groups are relatively limited since it is difficult for people of this age to comment and fill out questionnaires on short video platforms).

The remarkable aspect lies in the unanimous recognition across all age groups regarding the unparalleled efficiency and effectiveness of disseminating short videos, as shown in **Table 6** and **Table 7**:

Table 6. Q2

Group	N	Mean
1	1660	85.90
2	1584	85.55
3	1330	86.25
Total	4574	85.88

(I) Group	(J) Group	Sig.
1	2	.231
	3	.259
2	1	.231
	3	.024
3	1	.259
	2	.024

Test of Homogeneity of Variances. Sig. =.242

Do you think the digitally based literary narration in short video helps you to learn about the city (such as natural scenery, history, culture, etc.) more efficiently than the traditional literary narration in print media? (10 relevant questions are included in the category)

Table 7. Q3

Group	N	Mean
1	1660	80.23
2	1584	80.64
3	1330	83.30
Total	4574	81.26

(I) Group	(J) Group	Sig.
1	2	.221
1	3	.000
2	1	.221
2	3	.000
3	1	.000
3	2	.000

Test of Homogeneity of Variances. Sig. =.165

Do you think digitally based literary narration in short video helps you to learn about the city (such as natural scenery, history, culture, etc.) more effectively than traditional literary narration in print media? (10 relevant questions are included in the category)

As indicated by the 2 tables, group 3 ranks at the top (mean = 86.25; 83.30), and they strongly believe that the multimedia approach (such short videos) outperforms the print media in propagating the city and building up the cultural identification toward the city in which they dwell. To our surprise, group 3 enjoys a significant difference (sig. <.05) from group 2 in Q2 (efficiency) and a significant difference (sig. <.05) from group 1 and group 2 in Q3 (effectiveness), which indicates that senior recipients exhibit greater cultural identification than do the other 2 groups (group 3 is not significantly different from group 1 in Q2, but the mean of group 3 is still larger than the mean of group 1 in Q2).

For Q4 and Q5, detailed studies of digitally based literary narration in short video as a technologically empowered literary narration will be performed, and the results are illustrated in **Table 8** and **Table 9**:

Table 8. Q4

Group	N	Mean
1	1660	84.18
2	1584	84.37
3	1330	84.23
Total	4574	84.26

(I) Group	(J) Group	Sig.
1	2	.596
1	3	.897
2	1	.596
2	3	.709
3	1	.897
3	2	.709

Test of Homogeneity of Variances Sig. =.776

Do you think the system always offers the theme of short videos you like? (10 relevant questions are included in the category)

Table 9. Q5

Group	N	Mean
1	1660	79.69
2	1584	80.20
3	1330	79.83
Total	4574	79.91
(I) Group	(J) Group	Sig.
1	2	.238
	3	.747
2	1	.238
	3	.427
3	1	.747
	2	.427

Test of Homogeneity of Variances Sig. =.174

Do you like the way short video narrates the story and present you the image of the city than the way paper works? (10 relevant questions are included in the category)

Surprisingly, all 3 groups are not significantly different from each other (sig. >.05) in Q4 and Q5, and the means of each group are close (i.e., the means are above or close to 80), which indicates that all recipients in the test are positively impressed by the performance of digitally based literary narration in short video, as a technologically empowered literary narration sent by Tiktok's algorithm and the way in which Capcut AI makes narrates the stories. The truth is, once again, that technology in short videos not only enhances efficiency in creation and dissemination but also showcases a remarkable level of efficacy that caters to the audience's preference.

At the end of the questionnaire (Q6), we tested the ultimate goal of the study, which was to test the practical value of digitally based literary narration (as one of the examples of digital humanities). As shown in **Table 10**:

Table 10. Q6

Group	N	Mean
1	1660	80.64
2	1584	82.84
3	1330	84.60
Total	4574	82.55
(I) Group	(J) Group	Sig.
1	2	.000
	3	.000
2	1	.000
	3	.000
3	1	.000
	2	.000

Test of Homogeneity of Variances Sig. =.371

How much does your impression of the city improve after watching short videos featuring digitally based literary narratives? (10 relevant questions are included in the category)

As expected, the means of 3 groups are above 80, which manifests their strong positivity in the improvement of their impression of the city in which they live through the "efforts" of digital-based literary narration in short video. Similar to the former items in the test, group 3 is the most supportive (mean = 84.60) in the positivity of the digitally based literary narration in short video since Q6 reveals a significant difference (sig. =.000 <.05). Even though the senior group ranks at the top in the questionnaire, which makes

them the most supportive population in building up their attachment to the prefecture-level city, the young generation is, as a matter of fact, the driving force of the sustainable development of the prefecture-level cities. Furthermore, the younger generation is inundated with an abundance of information from metropolitan areas with their unique digitally based literary narration in certain media [24-27], rendering them less easily captivated by short videos originating from prefecture-level cities. Therefore, cultural identification is never easy for prefecture-level cities to “defend” among younger generations. Numerous studies indicate that these young individuals are a “vulnerable population” being drawn away by large cities and are considered “migrant groups” who tend to identify more strongly with the allure of urban life while lacking a corresponding cultural identification for the prefecture-level city where they are born [42-46]. In other words, younger generations tend to have a penchant for the growth of large cities and often lack an equivalent appreciation for the prefecture-level city of their birth because metropolises offer them high-paid jobs and more opportunities to enjoy the latest fashion even though life in metropolises is never easy. However, the younger generation never declines the “charm of the prefecture-level city of their birth”, and they need the prefecture-level cities to catch up with the modern trend to create and disseminate their own stories with a new narrative to form a sense of cultural identification. Jumping traditional literary narration and adopting digitally based literary narration facilitate the coordination and combination of different local elements in displays, such as local music, scenery, dialect, and cuisine.

As shown in **Figure 3**, the distribution of the values between the 3 groups is similar since the main recipients are in the range from 80 to 90, but unlike group 2 and group 3, the youngest generation still accounts for a certain part of the range from 60 to 80. Therefore, prefecture-level cities need to take more measures to boost the attachment of younger generations to the cultural identification of prefecture-level cities.

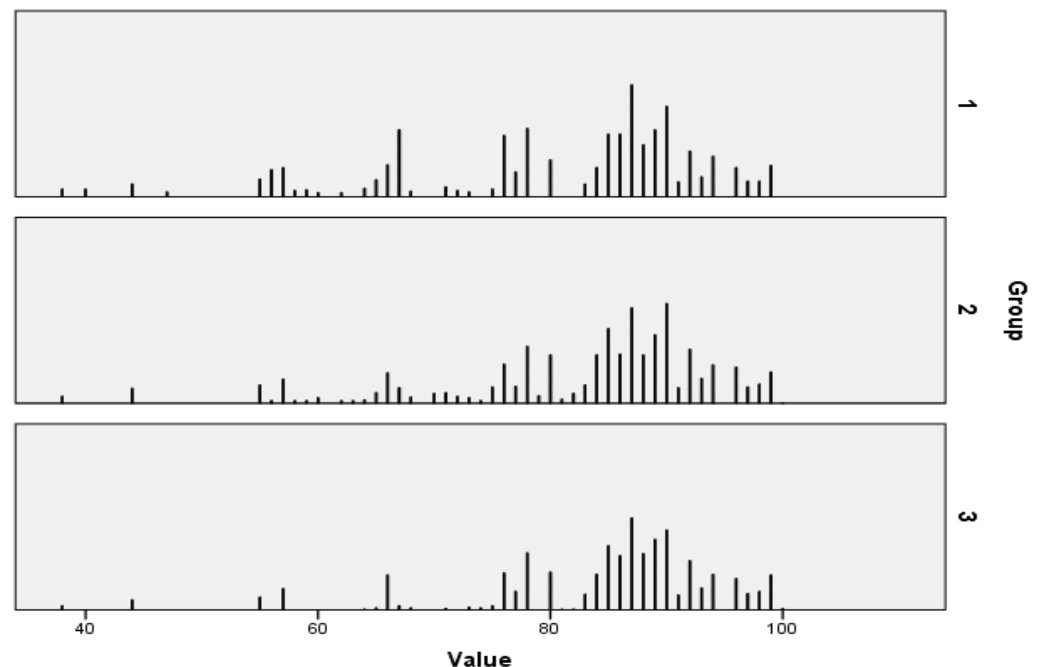


Figure 4. The bar distribution of Q6

Hence, prefecture-level cities should take advantage of technology to further enhance the dynamics of digitally based literary narration to fit the preferences of young people and stay focused on all groups to maintain the sustainable cultural identification of prefecture-level cities. Moreover, after determining what younger generations prefer, the next round of short video competition (such as the first step of the project in 2021) will be

more targeted with regard to different age groups (filtered by the AI algorithm) and tailor the unique preference in digital-based literary narration to different age groups (created by AI making). The establishment of such a virtuous cycle does not rely on the possession of advanced and sophisticated infrastructure such as that in major cities but rather perfectly aligns with the needs of 300 prefecture-level cities across China.

8. Findings

Clearly, H1 has been proven as the data indicate that digitally based literary narration, to a large extent, outperforms traditional literary narration and better meets psychological needs efficiently and effectively. By allowing denizens to articulate their own unique understanding of the city's narrative in their own distinctive manner and fit them in the "multimedia" dimension (altering the way of traditional literary narration from print media to digitally based literary narration in short video via technology on Tiktok) [33-36]. Based on the shortlisted entries, as portrayed in short-video competition, food culture and local humanity are the most prevalent themes, indicating that both the people and contestants hold a deep appreciation for culture, local cuisine and history, etc., and are displayed via digitally based literary narration [9]. These themes possess an unparalleled level of recognition and an unwavering desire to propagate this rich heritage. Therefore, it is evident that the cultural resonance of prefecture-level cities aligns more closely with local gastronomy and humanistic sentiments; thus, capturing these two facets constitutes a pivotal breakthrough in constructing the identification and attachment of denizens to the prefecture-level cities on which they dwell [14-17]. All these elements should be considered to be embedded in digitally based literary narration to boost cultural identification. The construction of identification and attachment among denizens necessitates a profound understanding of the local culture, history, status quo, cuisine, celebrities, and other facets. In this regard, AI algorithms serve as an invaluable tool to bridge this gap by eloquently narrating their preferences in a more universally embraced manner, and there must be one that meets their preferences [33].

H2 has also been verified, and the data prove that younger generations' psychological status varies with that of other generations; thus, more targeted efforts should be made to be put into digitally based literary narration. As the development of the social economy and other facets lags behind that of metropolises, with the power to "dictate traffic" firmly held by them, a substantial number of young individuals from China's 300+ prefecture-level cities migrate toward the bustling metropolises [48-52]. They encounter arduous challenges in establishing their own unique identity within these smaller cities and face even more formidable obstacles when assuming the responsibility of disseminating local culture to prefecture-level cities. Therefore, digitally based literary narratives, such as short videos, may serve as a solution for facilitating the cultural identification of denizens in prefecture-level cities since they are favored in the modern era. The questionnaire convinces us that the efficiency and efficacy of the broadcasting capability and dissemination of short videos (digital-based literary narration) outweigh those of print media (traditional literary narration). Denizens in this modern era are prone to taking multimedia as the main approach to gaining access to information, which paves the way for the technology empowerment of traditional literary narration. As revealed by the data from a precisely targeted audience (via the AI algorithm on Tiktok), the elderly generation is inclined to be more supportive than the younger generation with respect to urban image and city identification buildings. Therefore, actively encouraging local residents (especially young people) to cultivate a positive urban image and explore and disseminate local culture is an important avenue for enhancing cultural identification.

9. Conclusion

Social development and changes in citizens' ways of accessing information and disseminating multimedia transform traditional literary narration, which was frequently encountered via print media in the past [53,54]. To cater to targeted audiences, traditional ways of narrating stories should yield a "digitized" narrative to fit the modern era. With the assistance of technology such as Capcut, digital-based literary narration is no longer an arduous task since AI offers all "multimedia" approach needs, such as "sound effects", "pictures", and "background music" [11-14]. Subsequently, some technology, such as the AI algorithm of short video platforms, will accurately send these works to targeted recipients to give digitally based literary narration full play [7].

In the new era of the internet+, denizens of prefecture-level cities are incessantly, actively or passively inundated with digitally based literary narratives pertaining to first- and second-tier cities; hereby, this new literary narrative "seduces" them to constitute the cultural identification of large cities. The main reason for the dilemma of prefecture-level cities is that people can easily understand the outside world with "a swipe of their fingers" due to the rapid development of information platforms [25], such as short videos, and the digitally based literary narrative of dissemination is full of the charm of large cities, while the prefecture-level cities where they stay have too few opportunities to show their own charm due to the lack of "say". The "loss of voice" in the mainstream media is one of the main reasons for the declining sense of identity of residents of prefecture-level cities [16-18]; therefore, they have to determine a way to narrate their "charm". In the face of the new era of technology, it is time to make full use of network technology, information technology and other AI technology to build local cultural identification and enhance literary narratives.

Data availability

The data are available to anyone who needs it; please send an email to the corresponding author.

Ethical statement

The ethical committee has thoroughly validated aspects of the investigation, and prior consent from all participants is mandatory before proceeding with the questionnaire. All methods were carried out in accordance with relevant guidelines and regulations, and all experimental protocols were approved by Beijing Humanities and Social Sciences Academic Ethics Committee & Social Psychology Academic Investigation and Ethics Committee (Beijing). The PDF document of approval has been provided in the submission system.

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