



An Influence Analysis of Official WeChat Accounts of Chinese Universities Based on Entropy Method—Taking 2020-2024 as an Example

Minglu Chen*, Ziyi Lin

School of Humanities and Social Sciences, North China Electric Power University, Beijing, China, 102206

* cml_18021698198@qq.com

Abstract. Official WeChat accounts of universities are constantly developing, with an overall rising level of development and expanding influence, undertaking rich functions such as ideological and political education and cultural dissemination. However, significant differences in development levels still exist among individual accounts. Therefore, this study will explore the differences among these accounts and analyze the top ten official WeChat accounts of Chinese universities through a questionnaire survey and the establishment of an evaluation index system. Using the entropy method, the influence of the selected top ten official WeChat accounts of Chinese universities from 2020 to 2024 is measured and analyzed, revealing their advantageous characteristics. Specifically, the influence of the top ten official WeChat accounts of Chinese universities generally shows an expanding trend, exhibiting a fluctuating upward trend of “first growth—then decline—followed by sustained growth.” Furthermore, based on the questionnaire results and the conclusions of the existing entropy method analysis, it is proposed that official WeChat accounts of Chinese universities should continuously strengthen content innovation, deepen content content, effectively enhance interaction with users, increase interest and creativity, improve user stickiness, and expand their popularity and influence.

Keywords: Official WeChat accounts of universities; Influence; Entropy method

1 Introduction

There is currently a wealth of international research on education. As a leading nation in education, China, driven by policies such as the 20th National Congress of the Communist Party of China's report on “accelerating the construction of a cyber power and a digital China,” and the “Opinions on Accelerating the Construction of a System for Ideological and Political Work in Universities” issued by eight departments including the Ministry of Education, has witnessed the continuous development of official WeChat accounts of universities. Overall, their development level has risen, their influence has expanded, and they have undertaken rich functions such as ideological and

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political education and cultural dissemination in universities. However, significant differences in development levels still exist among individual accounts. Currently, the articles published by leading university official WeChat accounts have high dissemination and wide coverage, demonstrating high maturity and significant influence. It is recommended that all university official WeChat accounts take these leading accounts as benchmarks and improve themselves in terms of content innovation and operational mechanisms.

Chen Lu (2024) conducted an in-depth analysis of the WCI index of official WeChat public accounts of universities and proposed that in the current era of rapid digital development, universities should build a high-quality operation team, construct a distinctive news push system, and enhance user stickiness through two-way interaction, and continuously optimize the operation strategy of public accounts from different dimensions such as content, method, and dissemination, so as to promote campus culture construction and teacher-student communication [1]. Hu Zhenyu, Zhang Tiegen, and Bai Mengtian (2023) analyzed the development overview and main problems of official WeChat public accounts of universities and proposed to promote the development of discipline characteristics, improve the operation mechanism, and strengthen platform interaction, so as to promote the high-quality development of official WeChat public accounts of universities [2]. Zhang Weiliang and Zhang Ping (2017) selected the Communist Youth League WeChat public accounts and their articles of 91 universities in 32 provinces, municipalities and autonomous regions across the country as research objects and conducted research using stratified random sampling method. They proposed to deepen the content, connect mainstream content with mainstream audiences, optimize the structure of the Communist Youth League's official account operation team, build a content production model based on "user-generated content (UGC) + professionally generated content (PGC)," provide personalized services for young student audiences, enhance the platform's influence and affinity, accurately grasp internet thinking, carry out data marketing for the official account, and thus highlight the value of the Communist Youth League in serving young people [3].

While current research is broad in scope and detailed in its study of official WeChat accounts of universities, it primarily focuses on single dimensions such as content research and operational strategies. Furthermore, the research field is limited, lacking long-term follow-up surveys and exploration of the influence of official WeChat accounts of Chinese universities. To enrich this area of research, this study selects university WeChat accounts that were shortlisted for the "Top Ten Official WeChat Accounts of Chinese Universities" by the *China Youth Daily* from 2020 to 2024 for empirical research, analyzing the reasons for their successful development to offer more targeted suggestions. This study not only covers the changing characteristics over time but also possesses authoritativeness, thus providing a set of authoritative guidelines for the development of official WeChat accounts of universities.

2 Research Subjects, Analytical Methods, and Data Sources

2.1 Research Area

This study selected university WeChat official accounts that were shortlisted for the “Top Ten Chinese University Official WeChat Accounts” list published by China Youth Daily from 2020 to 2024. During the data collection process, WCI was used to determine that the top ten WeChat official accounts in terms of comprehensive ranking from 2020 to 2024 were Peking University, Wuhan University, Tsinghua University, Zhejiang University, Goodnight ECNU, Shanghai Jiao Tong University, Beijing University of Aeronautics and Astronautics, Sichuan University, Beijing University of Science and Technology, and Huazhong University of Science and Technology.

2.2 Research Methods

This study employs both quantitative and qualitative analytical methods. For quantitative research, the entropy method is used. The entropy method is an objective weight determination method based on information entropy theory, commonly used in multi-index comprehensive evaluation systems. In this study, it can effectively measure the annual evaluation of official university WeChat accounts and analyze their influence factors. The specific calculation process of the entropy method is as follows.

1. Data standardization: Assume that a province has m cities under its jurisdiction and the number of indicators is n . X_{ij} represents the standardized value of the i th indicator of $i = 1, 2, \dots, m$, the j th sample ($j = 1, 2, \dots, n$), $\max x_{ij}$ and $\min x_{ij}$ are the j th maximum and minimum values of the i th indicator, respectively. In addition, to avoid the case of no positive values, the standardized data are shifted by 0.0001. $X_{ij} = \frac{x_{ij} - \min x_j}{\max x_j - \min x_j} + 0.0001$ (1)
2. Calculate the j th weight of the i th sample under the index: $p_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}}$ (3)
3. Calculate the j th entropy value of the index: $e_j = -k \sum_{i=1}^m p_{ij} \ln(p_{ij})$, where $k = \frac{1}{\ln m}$ (4)
4. Calculate the coefficient of variation of the j -th index: $g_j = 1 - e_j$ (5)
5. Calculate the weight of the j -th index: $w_j = \frac{g_j}{\sum_{j=1}^n g_j}$ (6)
6. Calculate the comprehensive score of each year: $S_i = \sum_{j=1}^n w_j \times p_{ij}$ (7)

For qualitative research, this study uses questionnaire data collection, including single-choice and multiple-choice questions. The most frequently selected options are statistically analyzed as guiding factors for the development of official university WeChat accounts, thus providing empirical evidence and improvement directions for optimizing the operation strategies of these accounts. Based on grounded theory, two questionnaires were designed: one for the audience (“Questionnaire on the Usage of Official

University WeChat Accounts”) and the other for the operators (“Questionnaire on the Operation of Official University WeChat Accounts”).

2.3 Data Sources

The data used in this study comes from interview data, questionnaire survey data, the national ranking of the influence of WeChat public accounts of ordinary colleges and universities launched by China Youth Daily, and publicly available data from the official WeChat public account platforms of various colleges and universities.

3 Analysis of the Influence of Official WeChat Accounts of Chinese Universities

3.1 Indicator System

Based on the WCI value (WCI reflects the overall popularity of WeChat and the development trend of official accounts by the dissemination, coverage, maturity and influence of articles pushed by WeChat official accounts), the study determined that the top ten official WeChat accounts of Chinese universities are Peking University, Wuhan University, Tsinghua University, Zhejiang University, Goodnight Huazhong Normal University, Shanghai Jiao Tong University, Beijing University of Aeronautics and Astronautics, Sichuan University, Beijing University of Science and Technology, and Huazhong University of Science and Technology. Based on their simplicity, dissemination strength and influence, an indicator system was constructed to measure the development prospects of university official accounts and the factors affecting university official accounts, as shown in Table 1. The data was then substituted into formulas (1)-(7) to obtain the following indicator weights.

Table 1. Evaluation Index System for Measuring the Influence of Official WeChat Accounts of Chinese Universities

Primary indicators	Secondary indicators	Unit	Weight
authoritative	Articles covering the top 100	Chapter	8.66%
Influence	forwarding volume	indivial	42.84%
Dissemination power	Likes	indivial	9.65%
	Read count	indivial	27.06%
Simplicity	word count	Character	11.79%

3.2 Comprehensive Analysis

Based on the top ten WeChat official accounts from 2020 to 2024, the monthly data of articles, reposts, likes, views and word count of the top 100 accounts were used to obtain a comprehensive score by substituting the collected data into formulas (1)-(7), as shown in Fig 1.

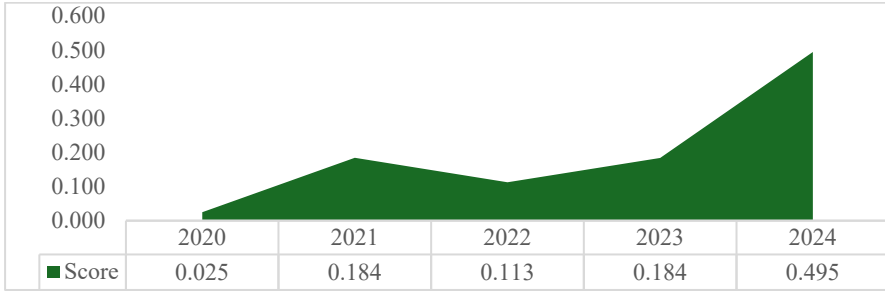


Fig. 1. Overall Influence Measurement Score of Official WeChat Accounts of Chinese Universities, 2020-2024 (with time as the variable)

As shown in Fig 1, the overall influence measurement score of official WeChat accounts of Chinese universities showed a fluctuating upward trend from 2020 to 2024. Specifically, it can be divided into four stages:

The first stage (2020-2021) was a period of rapid growth. In 2020, the comprehensive score of the influence measurement of official WeChat accounts of Chinese universities was 0.025, and in 2021, the comprehensive score of the influence measurement of official WeChat accounts of Chinese universities rose to 0.184. The period from 2020 to 2021 was the period of the outbreak of the COVID-19 epidemic. As an important carrier of online public opinion propaganda, official WeChat accounts of universities responded quickly and took the lead in the major epidemic, and promptly released authoritative information related to epidemic prevention and control, which met the rigid information needs of university teachers and students for epidemic dynamics and protection knowledge, and created a good public opinion atmosphere for carrying out epidemic prevention and control work [4].

The second stage (2021-2022) was a period of slow decline. In 2022, the comprehensive score of the influence measurement of official WeChat accounts of Chinese universities dropped to 0.113. During the period of 2021-2022, the epidemic prevention and control work became normalized, the audience's demand for online learning and work decreased, and the attention to official WeChat accounts of universities also decreased. At the same time, this decline also revealed the problem of “cultural gap” proposed by Zhang Weiliang and Zhang Ping from the side - when the pressure of the external environment eased and users returned to normal information consumption, the official WeChat accounts of universities failed to complete the “translation” of the discourse system in time. The traditional dignified and elite communication form and the acceptance psychology of post-95 college students who pursue cute, second dimension and emotional resonance were disconnected, which led to the intensification of the perception of content homogenization and the low willingness of users to interact [3].

The third phase (2022-2023) saw a slight recovery. The overall score rebounded to 0.184 in 2023, the same as in 2021. This slight recovery in 2022-2023 was mainly due to the initial adjustments and optimizations of the operational strategies of some university official WeChat accounts, which halted the previous continuous decline and began a slight rebound. However, it was still in a recovery phase and had not yet achieved a significant breakthrough.

The fourth stage (2023-2024) is a period of rapid growth. The comprehensive score in 2024 increased rapidly to 0.495, with a significant increase. The significant improvement in this stage from 2023 to 2024 is due to the systematic optimization and adjustment of the operation strategy of university official WeChat accounts, such as the improvement of article content quality, the improvement of the functions of official WeChat accounts, and the enhancement of interaction with the audience. Related research shows that the success of high-influence WeChat accounts lies in the organic combination of “content originality, readability and sustainability” and “active interaction of editors and high user stickiness” [1]. At the same time, the optimized configuration of elements such as title symbols, tweet types and update time can effectively improve the dissemination power [5]. Meanwhile, the rapid growth in this stage is also accompanied by the era dividend brought by the rapid growth of technology.

3.3 Analysis of Individual Differences in WeChat Official Accounts

Substituting the collected data into formulas (1)-(7), we obtain the individual score differences of public accounts from 2020 to 2024, as shown in Fig 2.

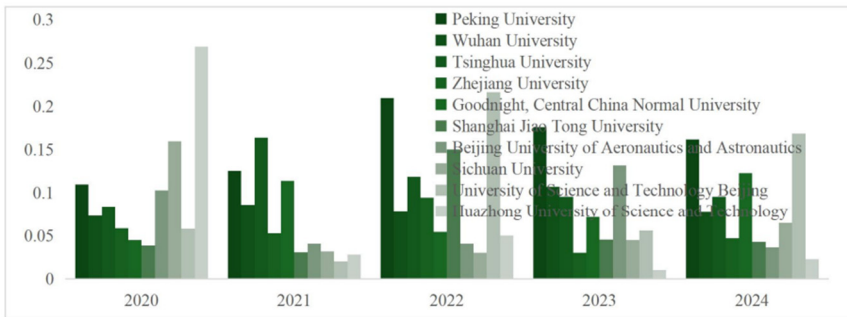


Fig. 2. Overall Influence Measurement Score of Official WeChat Accounts of Chinese Universities, 2020-2024 (with WeChat account as variable)

As shown in Fig 2, the overall influence scores of the official WeChat accounts of the ten universities varied significantly between 2020 and 2024, exhibiting a diverse development trend. Peking University had relatively high overall influence scores in 2020 and 2021, at 0.11 and 0.13 respectively, reaching a five-year high of 0.21 in 2022. While scores declined slightly in 2023 and 2024, Peking University remained in a leading position overall. Tsinghua University scored 0.08 in 2020, peaking at 0.16 in 2021, but subsequently declining year by year, reaching 0.10 in 2024. Huazhong University of Science and Technology ranked first in 2020 with a high score of 0.27, the highest in five years, far surpassing the other nine universities. However, its score plummeted in 2021 and has fluctuated at a low level ever since, reaching a low of 0.01 in 2023. Sichuan University achieved a high score of 0.16 in 2020, but it dropped rapidly to 0.03 in 2021, and has since fluctuated at a low level between 0.03 and 0.07.

Beijing University of Science and Technology scored relatively low in 2020 and 2021, at 0.06 and 0.02 respectively. Its highest score was 0.22 in 2022, followed by a

sharp drop to 0.06 in 2023, and a rebound to 0.17 in 2024. East China Normal University scored 0.05 in 2020, rose to 0.11 in 2021, fell back to 0.05 in 2022, and then gradually increased to 0.07 and 0.12 in 2023 and 2024 respectively. Wuhan University's PMI fluctuated slightly between 0.07 and 0.09 between 2020 and 2022, rising rapidly to 0.11 in 2023 before decreasing to 0.08 in 2024. Zhejiang University's PMI fluctuated repeatedly between 0.03 and 0.09, peaking at 0.09 in 2022, falling to a low of 0.03 in 2023, and then slightly recovering to 0.05 in 2024. Shanghai Jiao Tong University only reached its peak score of 0.15 in 2022, with scores in the low range of 0.03-0.05 in other years. Beijing University of Aeronautics and Astronautics scored higher in 2020 and 2023, at 0.1 and 0.13 respectively, with scores fluctuating slightly around 0.04 in other years.

In summary, Peking University's official WeChat account has consistently maintained a leading position in the overall influence measurement. Huazhong University of Science and Technology and Sichuan University's official WeChat accounts rose to prominence in specific years, but subsequently experienced a sharp decline and remained at a low level for a long period. Beijing University of Science and Technology and Goodnight Huazhong Normal University had relatively low scores in the early stages, but significantly improved in the middle or later stages. In contrast, the scores of universities such as Zhejiang University and Wuhan University changed little and fluctuated within a small range for a long time. Therefore, an analysis of the individual differences among official WeChat accounts of Chinese universities reveals that their rankings change slightly each year. Thus, learning from exemplary official WeChat accounts of Chinese universities should not be limited to a single university, but should focus on the aspects that need to be learned and adapted from the dynamic changes.

3.4 Questionnaire Analysis

648 university official WeChat accounts, conducted using the "Questionnaire on the Operation of University Official WeChat Accounts," analyzed factors such as content acquisition channels, content classification, content creation focus, user engagement, promotion channels, and risks. The following findings were made: Regarding content publishing, university official WeChat account creators considered information and news (64.51%), academic research (63.73%), and campus life (60.96%) to be the most important types of content to publish. Statistics show that creators primarily obtain topic materials from student and faculty submissions (66.36%), university websites/news (65.12%), social hot topics (62.19%), other social media platforms (55.4%), user needs surveys (54.01%), and campus hot events (46.76%). Furthermore, when creating content for their official accounts, the operating teams prioritized timeliness (62.65%), entertainment value (62.96%), and practicality (59.88%). Regarding improving user engagement, they believe that optimizing content quality (66.67%), holding regular benefit activities (63.27%), or regularly holding online and offline events (64.04%) are effective means. In terms of promoting WeChat official account content, they believe that methods such as forwarding to WeChat Moments (64.97%), promoting in WeChat groups (64.35%), and cross-promoting with other official accounts (56.64%) should be adopted. The questionnaire statistics show that 27.31% of operators

can systematically plan and build the brand image of their official accounts, 39.2% have some consideration but not a systematic approach, 10.03% have not yet formed a clear plan, and 23.46% have not considered it. The producers of official WeChat accounts of universities believe that the main challenges currently faced by university official accounts are the homogenization of content creation (67.44%), difficulty in grasping user needs (63.58%), and low team collaboration efficiency (60.03%). Therefore, in the future, we should strengthen content innovation (62.96%), enhance user interaction and participation (62.81%), and broaden the service functions and practicality of official university WeChat accounts (60.03%).

536 university official WeChat accounts, conducted using the “Questionnaire on the Operation of University Official WeChat Accounts,” analyzed factors such as content acquisition channels, content classification, content creation focus, user engagement, promotion channels, and risks. The findings are as follows: The survey respondents were primarily current students (75.56%), followed by faculty and staff (10.26%), alumni (9.89%), and other followers (4.29%). According to the questionnaire, the most popular content categories were information and news (72.76%), campus life (68.84%), and personal stories (58.02%). They also showed a greater preference for text-and-image posts (81.72%), video content (77.24%), and visual design content (60.82%). Regarding interaction, most respondents rarely interacted (74.07%) or interacted with the official accounts through likes (71.46%) or collections (59.7%). A small percentage left comments or messages (34.89%). Regarding the brand image recognition of WeChat official accounts, 52.05% of respondents felt the content was average, 26.31% felt it had a unique visual style and personality, 14.37% felt it lacked distinctiveness, 3.73% felt it was highly recognizable and had a unique visual style and personality, and 3.54% were unsure. In terms of satisfaction with official WeChat accounts, 42.72% of respondents were relatively satisfied, 37.13% were moderately satisfied, 9.51% were very satisfied, 8.96% were dissatisfied, and 1.68% were very dissatisfied. For suggestions regarding university official WeChat accounts, respondents believed that official university WeChat accounts should enrich content formats (73.32%), improve content quality and depth (69.22%), enhance interactivity and user engagement (69.03%), and increase posting frequency and timeliness (64.37%). The survey data shows that the respondents were mainly college students. They preferred information, campus life and personal stories, as well as diverse formats such as text, images and videos. Their interaction behavior was mainly in the form of light-weight methods such as liking and collecting. Overall, their evaluation of the brand recognition and satisfaction of the official account was moderate, and they generally expected further improvement in terms of the richness of content formats, the depth of content quality, the sense of interactive participation and the timeliness of publication.

4 Discussion and Conclusion

From 2020 to 2024, the overall influence of official WeChat accounts of Chinese universities showed a fluctuating upward trend, which can be divided into four stages: rapid growth in the first stage (2020-2021), a slow decline in the second stage (2021-

2022), a slight rebound in the third stage (2022-2023), and rapid growth in the fourth stage (2023-2024). Analysis of individual differences among the accounts revealed that top 985 universities such as Tsinghua University and Peking University consistently ranked at the top, leveraging their own reputation, influence, and high-quality content. While “Goodnight, Huashi” lacked the inherent advantage of university influence, its in-depth resource utilization and differentiated positioning, coupled with its insightful and meaningful content, fostered strong interaction and connection with its audience, resulting in a high level of influence.

This study, combining entropy analysis and grounded theory, and based on questionnaire data and the comprehensive score of influence measurements of official WeChat accounts of Chinese universities, proposes the following suggestions: Official WeChat accounts of Chinese universities should emulate high-quality accounts, continuously strengthen content innovation and depth, and avoid content homogenization. They should effectively strengthen interaction with users, enhance interest and creativity, and improve user stickiness. From a macro perspective, they should systematically build their account brands to expand their visibility and influence. Therefore, in the era of multimedia, official WeChat accounts of universities play a vital role in showcasing the university's achievements, disseminating information, and promoting ideological and political education. In the future, university WeChat account operation teams should continuously optimize their operational strategies, innovate content formats, and broaden dissemination channels to attract a wider audience and expand their influence.

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