

Preliminary Study: The Use of Social Media in China's University Libraries

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ABSTRACT

Social media is a new type of online media that gives users a great space for participation. Its characteristics include online, open communication, dialogue, community, connectivity, etc. Social media is now widely used in many areas of Chinese society. Social media is increasingly reliant on information access and information exchange activities. This phenomenon also appears in the field of China's higher education information service. This paper focuses on how university libraries can effectively use social media functions to carry out virtual education better. The aim is to find out whether the instrument of the survey is reliable to explore the impact of new social media functions of university libraries on the effectiveness of virtual education. The methods of this paper include the following stages: (1) identifying and describing the problem; (2) reviewing literature research; (3) elaborating on the research methods (including the questionnaire survey); (4) data analysis and findings; finally (5) summarizing and forming conclusions and giving suggestions. Based on the total sample size of 50 students from the first to the fourth year of Shandong Youth University of political science, Shandong Management University and Shandong Police College. This preliminary survey found that the instrument is reliable in measuring the social media functions among respondents. This indicates that the respondents have a relatively comprehensive understanding of the new functions and are willing to use them to achieve better virtual education. Therefore, Chinese student students are strongly willing to use new social media functions, and university libraries can promote virtual education by innovating new functions.

INTRODUCTION

Social media refers to internet-based platforms that enable users to create, share, and interact with content through virtual networks and communities. Defined as a subset of mass media, social media facilitates various interactions (Abbas, Aman, Nurunnabi, & Bano, 2019)—from microblogging and photo-sharing to professional networking and real-time communication. Famous social media platforms in China

include WeChat, Weibo, and TikTok, which allow for widespread and user-generated content, enhancing social connectivity. In essence, social media serves as both a means of communication and a powerful tool for fostering online communities, with broad implications for societal and cultural dynamics (Pew Research Center, 2021)

Virtual education refers to a teaching model based on digital technology and online platforms, enabling educational activities to be conducted in remote and virtual environments. Typically, virtual education includes both synchronous (real-time) and asynchronous (anytime) forms to meet the needs of different students. The scope of virtual education ranges from video conferencing to the application of immersive virtual reality (VR) and augmented reality (AR) technologies, which bring an immersive experience to learning and promote more profound learning outcomes (Wei & Yuan, 2023). Virtual education is a new type of education model that differs from traditional physical education, with information as the center, network as the medium, and computer as the means to transmit and receive educational information in virtual space. This study is limited to a comprehensive activity of university libraries utilizing their resources and services through social network platforms to promote the development of university students in learning, scientific research, life, and other aspects.

In recent years, the information service work of Chinese university libraries has gradually realized the importance of social media and has increasingly used social media to provide users with more convenient and instant services (He et al., 2021). The earliest applications were concentrated on platforms such as WeChat and Weibo, which were used for announcements and resource promotion to enhance the frequency of interaction and information circulation efficiency between libraries and users (Zhao et al., 2016). Data show that since 2015, the application of social media in Chinese university libraries has increased significantly, and more than 90% of academic libraries communicate with users through social media (Zhou et al., 2019).

The library's social media services have expanded from traditional information release to intelligent and personalized user experience design. The latest research shows that about 70% of university library users hope to receive resource recommendations and academic support based on personal interests, which promotes the introduction of intelligent recommendation systems (Xu et al., 2022). Taking WeChat mini programs and WeChat public accounts as examples, these services allow users to obtain customized content and real-time updates through mobile terminals. They meet users' personalized needs and enable libraries to use social media to promote users online effectively as well as library services, programs and events (Feng, H., 2021).

In addition, the application of social media in academic services has also received widespread attention. Some university libraries use social media platforms to provide digital academic support to meet the needs of scientific researchers for data sharing, research collaboration, and promotion of results. These services play an important role in scientific research, especially in interdisciplinary cooperation and resource sharing, increasing the breadth and depth of academic communication (Zhou et al., 2019). This shift reflects the potential of social media in academic services and the future development trend of library services. Liu et al. (2023) showed through a survey of 351 Chinese university students that Chinese university students deeply use social media, with 100% of respondents using social media every day and 93.5% of respondents using social media for more than 30 minutes every day (Liu, Hu, & Bi, 2023).

PROBLEM STATEMENT

Although Chinese university libraries have a positive attitude towards using social media for information services, they still face challenges in using social media to pursue virtual educational effects.

First, although some university libraries have developed dedicated mobile apps, their usage and user satisfaction have not met expectations. Many users report that these apps have problems such as low

utilization and actual service value not adequately reflected, resulting in poor user experience, which affects users' frequency and long-term retention rate. For example, Liu Xin (2019) selected 17 university libraries that have developed apps, and the average number of service items in these university library apps is 8.73, and the minimum number of service items is only two. In addition, the data shows that about 70% of users prefer to access library service information and academic resources through popular social media platforms such as WeChat or Weibo rather than through apps developed by libraries (Huang, 2017). This shows that libraries must pay more attention to user habits and improve the effect of apps' use and service coverage.

Secondly, university libraries are relatively less interactive with patrons on social media, and the instant communication function has not been used to its full potential. Research shows that although social media provides users with convenient communication channels, many libraries lack a systematic interaction strategy, and there are phenomena such as inconsistent titles, unclear definitions, and low service efficiency of interactive columns, resulting in low enthusiasm for interaction between users and libraries (Li, J., 2021). For example, Collins and Quan-Haase (2012) noted that some students' lack of interest in the library's activities on social media, especially in terms of academic support services, affected the effectiveness of the library's online services. This phenomenon is partly attributed to students' preference for social media as an informal communication platform, and the formal role of libraries makes it challenging to meet users' interactive needs (Burhanna et al., 2009). Therefore, some studies suggest that libraries should introduce more user interaction and feedback mechanisms on social media platforms to enhance user engagement and improve the attractiveness and effectiveness of services (Chua & Goh, 2010).

In recent years, Chinese university libraries' social media functions have become increasingly homogenized and lacking in innovation. Most libraries rely heavily on platforms like WeChat and Weibo, focusing primarily on routine information-sharing activities such as book recommendations, event announcements, and general reader services. With limited interactivity and customization, this one-dimensional approach fails to engage student users, ultimately leading to low participation rates (Qi, A., 2021). Despite the communication potential of social media, standardized content alone cannot retain user interest. Recent studies suggest libraries should enhance content diversity, interaction models, and data-driven strategies to improve user experience and engagement (Zhang, Li., 2020). Personalized services and innovative engagement strategies could help libraries meet diverse user needs. Therefore, experts recommend that university libraries invest more in creative social media practices to build unique library brands, fostering stronger connections with readers and increasing students' use of library resources and services.

OBJECTIVES OF THE STUDY

Based on the above situation, this study is dedicated to three goals:

1. Identify the actual situation of Chinese university students using libraries.
2. Identify Chinese university students' understanding of virtual education and their willingness to use the library's new social media functions.
3. Suggest new and more effective social media functions for university libraries to promote virtual education.

LITERATURE REVIEW

This study will focus on the following elements and functions by reviewing the problems found and the innovative functions summarized as needed for improvement.

Knowledge Community

The knowledge community of library social media is a virtual space related to library resources or activities centered around a common subject or hobby. In a knowledge community, libraries can provide users with online real-time information transmission, information resources, and other user services based on their own resources and establish multidimensional connections between libraries and users (Liu et al., 2019). Full interaction can be achieved among members of the information community. By making users feel connected to the community, information resources are fully utilized among members (Hu, J., 2012).

Co comment

It allows different users to add various forms of annotations, such as text, original handwriting, and pictures, to a specific information point of the same book or literature in library social media electronic reading, allowing users to exchange ideas and collide ideas directly through interaction (Ruiz-Ruiz & Izaguirre, 2022).

Subject Librarian

A subject librarian in a university library refers to a specialized staff member set up by the library according to the school's department settings and subject professional categories, establishing connections with them one by one, building a bridge between the department, subject professional, and the library, communicating with each other, and actively collecting and providing targeted literature information services for users (Zhang, C., 2019). The role of subject librarians is to maximize the transformation of knowledge value by fully revealing the hidden knowledge system to users. There are two levels of librarian function in social media. Firstly, users can directly contact the subject librarian of the library by calling or clicking to seek solutions to problems encountered during the use of the library. Secondly, the library's subject librarians can also be experienced teachers from other schools hired as subject librarians, answering questions about library information resources related to teaching, research, and other activities for students and new teachers. Of course, this function is set up in different disciplines. Personalized problems such as user learning, teaching, and scientific research can be solved quickly through precise interaction (Luo, Y., 2021).

Video Display Collection

Short video information is highly attractive to university students. The university library has set up a dedicated video display section on social media, allowing users to upload short videos related to library information resources and encouraging users to comment, bookmark, like, and discuss directly (Chen, et al., 2021). Short video competitions can also be held, allowing for a deeper exploration of library information resources in the form of videos and for users to interact fully (Du, P., 2021).

Listening and Reading Functions

Provide reading services for library books or other information resources (similar to Fandeng Reading and Lazy Reading functions), allowing readers to choose "listening" without the ability to read aloud or read usually. In addition, this function is not only output-oriented; users can also upload their reading works to the library's social media listening function module, displaying personalized reading works (Ma, R., 2022).

Research and Communication Platform

This is a platform-oriented application for scientific research. Researchers can create personalized topics in this functional module based on their research topics and interests. They are both resource users and service builders. In addition to adding existing library collection resources, other types of materials (such as PowerPoint slides) can also be uploaded for supplementation. After seeing the research topic created by

the reader, other researchers can pay attention to the resource and set up meetings within the topic for communication and discussion (Zhang & Yuan, 2017).

Reading Bank

This function will set reading growth points and achievement reward points for users based on the purpose of reading rewards. Users can check their total points, points from the past year, the number of books borrowed from the library, and various types of books borrowed at any time (Feng, R., 2017). Users can also display their reading results through various forms, such as reading mind maps, reading feedback, reading annotations, and reading answers, and earn reward points for their achievements. Users can exchange points for other readers' reading notes, library cultural and creative supplies, etc. Future recruiters can learn about the learning abilities of job seekers (university students) by reviewing their reading results (Tang & Liu, 2021).

Virtual education research focuses on important factors, which are also the targets for the seven new functions mentioned above. Virtual education is a new type of education model that differs from traditional physical education (Guo, et al., 2022), with information as the center, network as the medium, and computer as the means to transmit and receive educational information in virtual space. This study is limited to a comprehensive activity of university libraries utilizing their resources and services through social network platforms to promote the development of student students in learning, scientific research, life, and other aspects.

METHOD OF THE STUDY

The preliminary study aims to provide an opportunity to test key elements and data and develop a preliminary compendium of sustainability elements for social media functions in Chinese university libraries (S. Khadijah, 2021). If the researcher uses questionnaires as a data collection method, preliminary studies are essential for design and refinement (Cohen et al., 2007). Preliminary studies were conducted with small sample sizes to test the instrument and see data collection and analysis implementation.

Population and Research Area

The study area is where the study is conducted with the selected respondents. According to the research objectives of this article, the selected respondents were university students from Shandong Province, China. Therefore, this study was conducted in Chinese universities, specifically undergraduate universities in Shandong Province, China. This research site is seen as the most appropriate place to get answers based on the questions for this study. The study site selection is important because it provides contextual information to the study and helps the researcher understand the conditions under which the data were generated as well as the behaviors and perspectives of the respondents. An appropriate study area can enhance the relevance and credibility of the research (Leavy, 2022).

DATA COLLECTION PROCEDURE

As described in the second part of this article, the main objective of this study is to identify the actual use of libraries by Chinese university students, their understanding of virtual education, and their willingness to use new social media functions of libraries, and then propose more effective new social media functions of university libraries to promote virtual education. To achieve the above goals and ensure the logical clarity and smooth execution of the research, this study has achieved the objectives in the following steps, as shown in Figure 1.

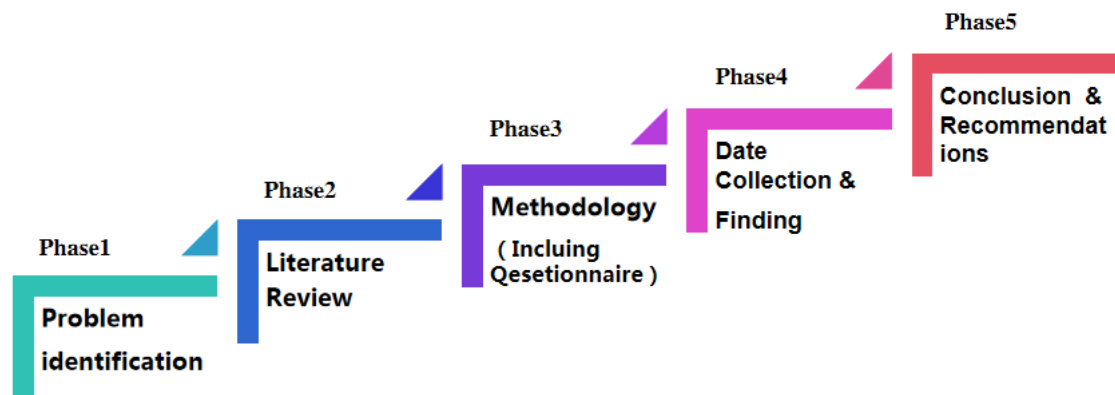


Figure 1: Step-by-Step Phases Involved in This Study

Overall, this study adopts a quantitative research method. Specifically, it uses a quantitative cross-sectional method. Bryman, A. (2016) believes that quantitative research is suitable for using cross-sectional survey methods and emphasizes the effectiveness of using them to measure multidimensional concepts in descriptive and explanatory research. This method is conducted through survey methods, using a questionnaire based on the research's objective. (Razuan et al., 2023).

The first phase of this study is mainly concerned with formulating questions and elaborating on specific questions that led to this study. As a result, research objectives are formulated to find solutions to the problems raised in the study. In the second phase of this study, a literature search was conducted on the questions raised in the first phase to identify relevant studies on the social media functions of Chinese university libraries. The retrieved literature was collated, summarized and analyzed. Several elements and functions were proposed from previous studies related to the topic and used in preparing the questionnaire for the next phase. The third stage is the development of the questionnaires. The questionnaire is divided into three parts. The first part is the demographic background of the participants. The second part of the questionnaire is about participation in using the library's social media. The third part is the participants' willingness to use the new social media features of the University Library. The questionnaire items were measured using the Likert scale method, with each statement containing five options, numbered 5, 4, 3, 2, 1, representing the intensity of attitude from "strongly agree" to "strongly disagree". The fourth stage is data collection. The questionnaires were distributed offline and online, with the online distribution process first forming the questionnaire in the exclusive system module of the researcher's institution, then generating a QR code and distributing it through the WeChat application. The offline process involved directly distributing the paper version of the questionnaire to the respondents. The questionnaires were distributed to the sample size, and the data collected were then identified as valid and not valid. Regarding data collection, this study refers to the questionnaire based on previous surveys about social media users in Chinese university libraries, namely "Survey on User Needs of University Libraries on Social Media," and improves the scale of virtual education and social media functions on this basis. All participants in this study gave informed consent before participating. The information obtained during the study is strictly controlled for use within the study. According to the Data Protection Act, the survey questionnaires and research data on the computer will be destroyed within five years after the completion of the study. In the fifth stage, the data collected are analyzed, and a survey report is written based on the results of the data analysis, which are summarized in subsequent chapters of the paper.

DATA ANALYSIS METHOD

For data analysis in this study, SPSS (Statistical Package for the Social Sciences) was used due to its strong capacity for managing large datasets and performing complex statistical tests. This software is

particularly effective for descriptive statistics and correlation analysis, all of which were integral to this research. With functions ranging from basic data manipulation to advanced statistical modeling, SPSS is a versatile and reliable platform for deriving insights from quantitative data. SPSS was used in this study to measure instrument reliability and correlations between variables in terms of social media functionality. This study employs descriptive analysis to examine library social media usage patterns among Chinese university students and their willingness to engage with new features. The analysis focuses on quantifying and assessing the frequency of information collected from respondents, utilizing percentage-based metrics to process and interpret the data. As a fundamental quantitative research component, descriptive analysis provides essential insights by offering a systematic overview of the collected responses. This analytical approach assessed the frequency distributions and percentage values for each questionnaire item, accompanied by a scale analysis of the distributed survey instruments. The primary objective of this descriptive analysis is to evaluate the level of acceptance of virtual education and to gauge the willingness of Chinese university students to adopt new library social media features. This objective aligns with the first and second research goals, emphasizing the numerical characterization and comparative evaluation of user preferences and engagement levels.

The results of this descriptive analysis are systematically presented using tables, charts, and graphs, ensuring clarity and comprehensibility in visualizing the patterns and trends identified in the data. These visual representations contextualize the findings and provide a robust basis for subsequent discussions and interpretations.

DATA ANALYSIS

Demography information

This study is descriptive and exploratory in nature. The target population of this study is the undergraduate student group at the undergraduate level located in Shandong Province, China. Therefore, the type of respondents is relatively clear and simple, which can help to minimize the impact of irrelevant factors, making the research results more authentic and focused. In this study, we selected 50 university students from the first to the fourth year of Shandong Youth University of political science, Shandong Management University and Shandong Police College as the sample. A descriptive analysis was conducted to explain the background of the respondents in this study (Table 1).

Table 1: Demographic Information (n=50)

Demographic Information	Frequency	Percentage (%)
Gender		
• male	26	52%
• female	24	48%
Semester or what year		
• Freshman	25	50%
• Sophomore	6	12%
• Junior	12	24%
• Senior	7	14%
Major		
• Teacher Education and Language majors	1	2%
• Management majors	2	4%
• Finance and Economics	3	6%
• Computer majors	23	46%
• Communication	9	18%
• Electrical and Power Majors	6	12%
• Others	6	12%

Demographic Information	Frequency	Percentage (%)
Duration of use of library social media		
• Less than 1 year	29	58%
• 1-3 years	19	38%
• 4-5 years	1	2%
• More than 5 years	1	2%
Monthly living expenses (RMB)		
• Less than 1000	9	18%
• 1000~2000	38	76%
• 2000~3000	2	4%
• More than 3000	1	2%
Frequency of library use per week		
• Less than once on average	17	34%
• 1-3 times	22	44%
• 4-5 times	3	6%
• More 5 times	8	16%

From Table 1 above, we can see that 50 university students participated in the questionnaire survey. Among them, 26 (52%) are male university students and 24 (48%) are female university students. They are distributed among different university grades, including 25 (50%) freshman, 6 (12%) sophomore, 12 (24%) junior, and 7 (14%) senior. The university students tested were also distributed in different majors.

Usage Intention

One of the main goals of this study is to explore Chinese college students' willingness to use new social media features in libraries. A questionnaire survey was conducted among 50 university students, and the 50 questionnaires that were received were statistically analyzed using SPSS to understand better the usage and willingness status of Chinese university students towards library social media. The data was summarized into several items based on the research design and survey results. During the data processing and analysis, summarizing the survey results into several items and classifying them according to each question is a very effective method. This method helps to present the data, making it easier to understand and interpret. Table 2 shows the scoring situation of each item.

Table 2: Willingness Scores for New Social Media Functions in Academic Libraries

Item	Result
• Knowledge and understanding towards virtual Education.	4.48
• Willingness to use knowledge communities	4.43
• Willingness to Use Common Comments	4.37
• Willingness to Use Subject Librarian	4.42
• Willingness to Use Video Showcase	4.33
• Willingness to Use Listening and Reading Functions	4.40
• Willingness to Use Research and Communication Platforms	4.45
• Willingness to Use Reading Bank	4.44

Reliability Analysis

In addition, to ensure the accuracy of the measurement results, this study also conducted reliability tests. Reliability analysis is used to verify the instrument's reliability (methods). At present, Cronbach's α coefficient is commonly used for analysis in social science research. If the reliability coefficient is above 0.9, it indicates very good reliability; if it is between 0.8 and 0.9, it indicates good reliability; between 0.7 and 0.8, it indicates relatively good reliability; between 0.6 and 0.7, it indicates acceptable reliability; below 0.6, it indicates the need for revision. Table 3 shows the reliability coefficients of the items in the research questionnaire.

Table 3: Reliability Analysis

Variable	Cronbach's Alpha
Knowledge and understanding towards virtual Education.	0.90
Willingness to use knowledge communities	0.87
Willingness to Use Common Comments	0.92
Willingness to Use Subject Librarian	0.91
Willingness to Use Video Showcase	0.92
Willingness to Use Listening and Reading Functions	0.89
Willingness to Use Research and Communication Platforms	0.91
Willingness to Use Reading Bank	0.90

FINDINGS

Current Status of Library Social Media Usage

In this study, the university students participating in the questionnaire survey are distributed across different grades. As can be seen from Table 1, the proportion of users using library social media within 3 years reached 96%, which is roughly equivalent to the number of students in grades 1-3, indicating that the vast majority of respondents began using the library's social media after entering university. In terms of the frequency of using the library, 78% of the respondents use it no more than 3 times a week, and an even higher 34% use it less than once a week, suggesting that the university library has insufficient stickiness for university students.

University Students' Understanding of Virtual Education

The level of understanding of virtual education (Table 4) shows that the agreement value for the statement "Virtual education is a new educational model that is different from traditional physical education" reached 4.38 points; the agreement values for virtual education on social networking platforms (items 2-4) were all above 4.46 points. The agreement value for using social networking platforms to promote virtual education in the research area, "Virtual education conducted through social networking platforms should be effectively applied in Shandong Province's higher education," reached 4.54 points. The agreement values for the educational effectiveness of social networking platforms among students were also all above 4.42 points. This indicates that students have a cognitive foundation for virtual education and a high level of positive recognition. There is also a high level of agreement on the relevance of social networking platforms to virtual education and the ability of social media networks to promote educational effectiveness.

Table 4: Knowledge and Understanding Towards Virtual Education Virtual Education Understanding Level

Items	Result
1. Virtual education is a new educational model different from traditional physical education.	4.38
2. Virtual education through social networking platforms is centered on transmission and access through electronic devices inside and outside the educational institution.	4.50
3. Virtual education through social network platforms requires computers and the internet as important tools.	4.54
4. Virtual education through social networking platforms can be facilitated through students' own resources and services (e.g. university libraries) in their studies, research and daily lives.	4.46
5. Virtual education through social network platforms should be effectively applied to higher education in Shandong Province.	4.52
6. Social networks are an important platform for establishing virtual education.	4.52
7. Social networking platforms can be effective in supporting student learning, research and other student activities (discussions, sharing ideas, etc.).	4.42
8. Social networking platforms connect students with resources and experts around the world, building student communities.	4.52

Willingness of University Students to Use New Social Media Functions in The Library

Respondents were required to indicate their degree of agreement with each statement, and the average score reflected the overall evaluation. As can be seen from Table 2, the respondents' evaluation of each group of statements was above 4.33 points, indicating that the respondents have a relatively comprehensive understanding of the new features and expressed a stronger willingness to use them. Among them, the willingness to use is strongest for the research communication platform function. In comparison, the willingness to use is relatively weak for the functions of common comments and video showcase, which may be related to university students not having much contact with mature products.

CONCLUSION AND RECOMMENDATIONS

This study has explored the potential of social media functions in improving the virtual education landscape of university libraries in China, focusing on undergraduate students in Shandong Province. The findings highlight the growing importance of social media for communication, resource sharing, and community building. The study identified high student willingness to adopt innovative social media functions for academic and personal development. Specifically, the strong preference for a research communication platform underscores the demand for collaborative and interactive academic spaces.

However, challenges such as limited interactivity, homogeneous content, and insufficient integration of user habits with library services were also evident, indicating the need for strategic improvements.

Libraries should prioritize personalized services that align with users' diverse academic and personal needs. By utilizing social media tools and technologies such as artificial intelligence and machine learning, libraries can analyze user behavior to provide customized content, such as book recommendations, academic resources, and event notifications. Personalized features can be integrated into platforms such as WeChat official accounts, Weibo, or library apps. In addition, some motivational interactive elements (such as a reading habit points system, achievement badges, or interactive challenges) can encourage students to participate more frequently in library services. These strategies not only increase user satisfaction but also promote long-term participation.

Among the new features in the questionnaire, respondents have the highest recognition of the research communication platform. Libraries should design dedicated research communication platforms to respond to the strong interest in research collaboration tools. These platforms can serve as virtual hubs where students and researchers share knowledge, discuss topics, and access interdisciplinary resources. Key features could include discussion forums, virtual meeting rooms, and tools for co-authoring papers or managing projects. Integrating these features with social media platforms allows seamless communication, while data sharing options enhance research productivity. Providing training sessions and user guides for these platforms will ensure their accessibility and effective utilization.

Libraries should expand the use of interactive and multimedia content such as video and audio to meet the preferences of modern students. Short videos, video showcases, and listening and reading functions can make learning more attractive and easier to understand. Short videos, live sessions, and infographics can make learning more engaging and accessible. Creating a dedicated video section on platforms like WeChat or Weibo, featuring tutorials, library tours, and resource highlights, would increase visibility. Additionally, competitions such as short video contests or creative content challenges can encourage user participation and generate organic interest. These approaches make libraries not only sources of information but also centers of innovation and creativity.

To adapt to the ever-changing needs of users and the continuous development of technology and products, libraries should establish a social media function model for university libraries. University students have high expectations for the new social media functions of the library and show a strong willingness to use them. Libraries can use social media to improve services and launch new functions that resonate with students. Based on the fact that most university libraries use social media, how to promote better virtual education through innovative functions is an important task facing the next step. Exploring the completion of this task will help identify gaps, improve the actual effect of virtual education in university libraries, and enhance the user experience of university students.

By focusing on these core areas, university libraries can enhance their social media strategies to create meaningful educational impacts, increase user engagement, and position themselves as essential resources in the virtual education ecosystem.

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