



Applications of Mobile Social Media: WeChat Among Academic Libraries in China



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ABSTRACT

This paper describes the application of the social media platform WeChat. It explores the use of this emerging mobile app using the official WeChat accounts of the top 39 academic libraries in China. The findings indicate that approximately one third of the libraries use WeChat as a marketing tool to promote collections and services for users. Most of the 39 libraries, however, are still using the most basic functions. Advanced functions urgently need to be adopted. The main uses of WeChat are general social networking services (SNSs) and automatic answering and interaction features, which include seeking and sharing information, user self-service, and keyword-identified reference auto-responders. The study uses six aspects of quality to evaluate the interaction and content delivered by WeChat. These include the volume of information, information content quality, concordance rate, frequency, self-service, and basic features. The experience of Chinese university libraries is used to provide recommendations for other libraries.

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INTRODUCTION

The advancement of mobile network speed and wireless network coverage has increased the popularity of smartphones, tablets, and other mobile intelligent terminals among Chinese academic library users. The dominant application (App) in China is the mobile social medium WeChat (or Weixin in Chinese—for more details see <http://www.wechat.com/en/>). In China, the App boasts 271.9 million active monthly users, an increase of 15.3% QoQ or 124.3% YoY (Tencent, 2013). Launched in January 2011 by Tencent™—whose products include official WeChat accounts, PC desktop instant messaging client-QQ, Q-zone, Twitter-like microblogging platform Weibo, and mail services—WeChat offers a free instant messaging application service for smartphones and enables voice, text, pictures, videos, and location information exchange via mobile phone. It is also a platform to transmit real-time voice intercom, video calls, group chat, and post pictures on the WeChat activity timeline (Moments), which, like Facebook, allows users to share photos and updates with

their contacts, publish status updates with illustrations, or other content such as comments and retweets or forwarding. Since its launch, WeChat has rapidly become an integral part of everyday life (Skuse, A. for CNN, 2014).

This study examines WeChat official accounts, a new functional module for WeChat. Libraries, universities, governments, and companies can freely apply to establish official WeChat accounts. Previous studies primarily focused on the application of Web2.0 technologies and social media websites in libraries. This study investigates emerging social media tools, specifically WeChat, and their application in the top 39 university libraries in China and identifies the functions applied in these libraries, their interaction with users on WeChat, content classification, self-service features, and quality appraisal when using the App. This study presents the prospect of applying WeChat in libraries, and promotes its use in library services to facilitate the use of library resources.

RESEARCH OBJECTIVES AND QUESTIONS

This study identifies how WeChat is applied in the top 39 Chinese academic libraries, to examine the level of application, to describe the characteristics of application, and to provide practical advice and detailed examples. The authors consider this process important in the final formulation of guidelines for libraries and librarians in building and managing a WeChat presence.

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To achieve these objectives, the study answers the following questions:

- Which libraries have applied for an official WeChat account?
- How do academic libraries apply WeChat, and what potential issues have emerged from the practice?
- Is the quality of WeChat's application in libraries of a sufficient standard?

BACKGROUND

WeChat, the popular instant-messaging App created by China's largest Internet Company, Tencent, provides a new way to connect with friends across platforms. Its features include chatting with friends in live chat sessions, group chat, video calls, voice chat, Moments (a timeline where users can “like” or “comment”), look around, and games (WeChat, 2013). Users can receive different services and information by following official WeChat accounts for reading, replying, storage, sharing, and re-tweeting. WeChat official accounts are categorized as service accounts that send a text message or illustrated information monthly and subscription accounts that can push a group or single information with illustrations daily. General information on WeChat official accounts includes WeChat official account names, WeChat ID, logo, introduction, verified accounts, view history, receive messages, message, and an “unfollow” button. Some of these elements are important in attracting users' attention, and are highlighted when libraries or other users apply for official WeChat accounts. “Introduction” briefly describes functions to users so that they can understand the App's general features and services before following the account. “Verified Accounts” are those authenticated by Tencent. To apply for certification, an account must have at least 500 followers. After subscribing, the user can access all push information in “view history”—from the first message published, not just from when the user started following the account. The “receive messages” button enables users to block messages they do not want to receive. This function no longer sends reminders, but can be located in “view history.” All records, including reference information, one-to-many information, and all system auto-response messages can be retrieved.

WeChat is an efficient tool in libraries. Generally, libraries publish notices on their websites regarding established services to inform users of features, services, tips, and following methods (scanning a QR code, searching by name or ID). A welcome, recommendations, and contact information (e.g., telephone number) are also included to promote and facilitate better use of WeChat. When following the library official account, users automatically receive a custom message and the equivalent first push information—“welcome message” or “automatic greeting”—by subscription. The first one-to-many message also includes information on the platform's capabilities, such as greetings, functions, contact information, and navigation services. Here, the “navigation service” describes the scope of self-inquiry information and self-services functions, and the keywords, letters, or numbers to be entered to obtain information, as illustrated in Fig. 1.

LITERATURE REVIEW

Mobile social media enables users to maintain and foster social connections with members of a social network. Moreover, they can conduct real-time communication anytime, anywhere via a portable mobile device enabling the inexpensive exchange of text, video calls, and voice chats. Social media are also easily accessible and immediate because the user always has the mobile device. Essentially, mobile social media services provide an “always-on” environment for information exchange among members of social networks. This concept draws on Counts and Fisher's (2010) definition of mobile social networks. In recent decades, technological developments have led to a global social media revolution, which has led to the advancement of many social networking

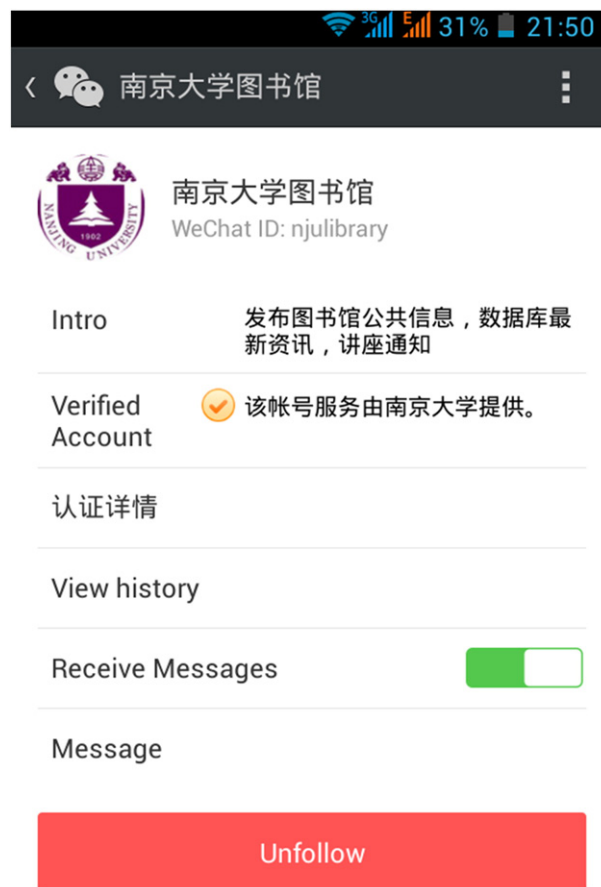


Fig. 1. Profile of WeChat official account.

services (SNSs). WeChat is an instant messaging (IM) and SNS platform, enabling interactive exchange through mobile devices, so-called mobile social media.

Today, the use of social media in libraries is widespread (Jahan & Ahmed, 2012; Kim & Abbas, 2010; Linh, 2008; Si, Shi, & Chen, 2011). Studies demonstrate that some university library digital resources and services are fully utilized and developed through social media tools (Harinarayana & Raju, 2010; Liu, 2008). Numerous studies indicate the benefits of social media in reference services and promoting library resources and services, and that librarians view the new technology positively. Social media is also reported to aid library staff in keeping up-to-date with resources and activities in their profession (Chu & Du, 2013). Some researchers have noted that challenges and obstacles in the process of using social media tools (Arif & Mahmood, 2012; Chu & Du, 2013), while other studies investigate the use of social media websites in libraries (Ayu & Abrizah, 2011; Chua & Goh, 2010; Mansor & Idris, 2010).

Bhatti and Amjad (2013) identified the frequency and purposes of using social media websites—Twitter, Wikis, Blogs, Flickr, MySpace, Tags, Instant messenger, LinkedIn, Delicious, and Stumbleupon—among library and information studies (LIS) students at the Islamia University of Bahawalpur. Hughes (2013) predicted the growth of social media tools in academia. Tay, Glass, and Chew (2013) implemented the use of Foursquare, a location based services (LBS) App that can engage users and promote library activities and events (Tay et al., 2013). Librarians at Boise State University and Oregon State University formulated treks and challenges using SCVNGR⁴ for library orientation and

⁴ SCVNGR is a game-based geolocation application where users can earn points or gain rewards by completing challenges and treks. Builders design questions that involve text based answers (open ended or multiple choices), QR codes, or photo challenges.

instruction. They contend that SCVNGR is a better environment than Foursquare for these purposes (Vecchione & Mellinger, 2011).

Numerous studies address dominant Chinese social media. Saw, Abbott, Donaghey, and McDonald (2013) determined that approximately half of Chinese students use Renren (a Chinese equivalent of Facebook) as much as Facebook to find information. Language barriers mean that students from China are the only international group to exhibit a noticeable difference in their use of Renren and Q-zone. As such, Saw et al. recommend that for institutions with a large cohort of students from China, use of Renren and possibly Q-zone should be monitored for their potential as engagement sites. Similarly, Chu and Du (2013) designed survey questionnaires for respondents from libraries using social networking tools. They noted that participants would be interested in using Renren to promote library resources, services, updates, gather feedback, and communicate with students. Many Chinese contributors examined appropriately deployed localized social media websites—Renren, Sina Weibo, or Tencent Weibo—in libraries (Ding, 2010; Huang, 2012; C. Li, 2012; J.B. Li, 2012; Liu, 2012; Xie, 2013; Yang & Li, 2012; Yu, Asur, & Huberman, 2011; Zhang, Lian, & Dai, 2013). These studies outlined the importance of promoting library services, and addressed potential barriers and solutions. To our knowledge, these social media provide sites and desktop application services. In addition, they have also developed mobile applications compatible with most operating systems.

Most literature relates to social media websites. However, while mobile social media applications are often used in mobile smart terminals, this is rarely reported in scholarly journals. This research gap motivated us to investigate the application of WeChat in Chinese academic libraries.

The authors retrieved three major full-text Chinese language databases, namely China National Knowledge Infrastructure (CNKI), VIP Chinese Scientific Journals Database, and WanFang Digital Periodicals, the Chinese equivalents of ScienceDirect, Emerald, or SpringerLink. Twenty-eight articles were retrieved in the LIS field (conducted on November 1, 2013 with updated searches in April 2014), primarily on the application exploration, introduction, and strategy (Du, Guo, Li, et al., 2014; Hao, 2013; Huang, 2013; Jiang & Qin, 2013; Kong, Liao, Zi, et al., 2013, 2014; Wang & Hong, 2013; Wei, 2013; Xiao & Huang, 2013; Xu & Wei, 2013; Zhang & Bian, 2013).

Indeed, these articles are important in understanding the role of WeChat in the library and substantiating the recommendations presented here.

METHODOLOGY

RESEARCH METHOD

This study uses content analysis to analyze texts, documents, webpages, and one-to-many message content. Data was analyzed in three stages. First, website content and hyperlinks were identified. Second, one-to-many message content was classified by purpose and features. Barriers and solutions were further summarized. The third step of the analysis evaluated the content using the quality evaluation framework developed in the subsection “Quality Appraisal”.

RESEARCH SAMPLE

There are 2138 regular universities in China (Ministry of Education of the People's Republic of China, 2012), which makes it difficult to analyze every university library completely. In China, local libraries face challenges when adopting WeChat tools, namely inadequate technical skills (unwillingness of librarians to accept new innovations or technology); inadequate awareness of the benefits; inadequate supportive policies, strategies, and plans; and inadequate financial resources (Aharony, 2012; Baro, Ebiagbe, & Godfrey, 2013). It is inferred that some of these university libraries could face human resource or financial restrictions, which may prevent them from engaging WeChat technology in their

library services. However, a few local university libraries recently made significant strides in this field (Kong et al., 2013, 2014).

There are 39 top Chinese universities directly under the administration of the Ministry of Education in China that are designated for the national key construction of the “985 Project,” an important strategic development project for higher education institutions (HEIs) in China. These universities are encouraged by extravagant investment from the central government to become internationally renowned research universities; thus, they represent the highest level of higher education in China (Han & Liu, 2010).

The sample for this study comprises these 39 academic libraries. Their librarians demonstrate a high level of information literacy and ability to implement new technology. The results of this study can serve as a model, providing rigorous recommendations or best practices for other libraries.

DATA COLLECTION

To determine the use of WeChat official account and obtain accurate data, the following steps were implemented:

- Step 1. Scanned 39 libraries' webpages manually, including the homepage, sub-pages (e.g., news, patrons service) to search for WeChat icons, QR codes, and opening announcements. The authors independently found WeChat applications with links from home pages or sub-columns. If no WeChat information was found, the authors proceeded to the next step.
- Step 2. Searched websites for words or phrases containing “Weixin” or “WeChat.” When the library website did not have a “search” function, “Google search” was used to search within the libraries' websites. An example is the WeChat site: www.lib.nankai.edu.cn. In so doing, the official WeChat accounts of Jilin University and Beijing Normal University Libraries were found.
- Step 3. Searched hosted libraries' WeChat accounts through the WeChat App using the keyword “library”—for the sake of recall, because some accounts used the abbreviated form of the name. By doing so, Renmin University of China and Central South University Libraries were found.
- Step 4. Consulted with librarians through virtual reference, e-mail or IM (if identified as having applied for a WeChat account, they were no longer consulted).

Data collection comprised two phases. The first phase was from November 18, 2013 to November 20, 2013 during which overall profiles were collected through the processes described above. The second phase followed all established platforms simultaneously, and was initially conducted on November 21, 2013. After collecting a month's worth of data content from the WeChat platforms of all libraries, the investigation ended on December 20, 2013. Meanwhile, the authors interacted with platforms to experience all service features, which were then extracted for coding.

FINDINGS

THE STATUS OF OVERALL APPLICATIONS

The survey found that 11 libraries had applied for a WeChat official account, and about one third of academic libraries (11/39) used WeChat to promote library resources and services and to provide self-services such as catalogue searches, to check loans, renewals, recalls, browse history messages, or inquire about talks or available seats. Ten libraries had subscription accounts, while one had a service account (Shanghai JiaoTong University). Table 1 presents the data and summarizes the survey findings and key characteristics of the 11 libraries.

Table 1
Summary of characteristics.

U	Functions										Advanced functions			
	WeChat ID	I	Intro	V	O	T	W	P	S	B	N	SII	SEF	K
Thu	Thu-lib	✓	✓	x	✓	Apr. 8, 2013	✓	x	un	37	✓	✓	✓	✓
Pku	pkulib_1902	✓	✓	✓	✓	Jun. 6, 2013	✓	x	2 h	11	x	x	x	x
Xmu	xmulib	✓	✓	x	x	Oct. 17, 2013	✓	x	30 min	28	✓	✓	x	✓
Nju	Njulibrary	✓	✓	✓	✓	May 27, 2013	✓	x	un	12	✓	✓	✓	x
Sjtu	Sjtu lib	✓	✓	x	x	Jun. 17, 2013	x	x	un	0	✓	✓	✓	✓
Sdu	Sdu-lib	✓	✓	x	✓	Sep. 9, 2013	✓	x	un	0	✓	✓	x	✓
Ruc	Rmdxtsg	x	✓	✓	x	Jun. 4, 2013	✓	x	24 h	7	x	x	x	x
Jlu	Jlulib	x	✓	x	✓	Aug. 26, 2013	✓	x	24 h	19	✓	✓	x	x
Buaa	Buaalibrary	✓	x	✓	✓	Nov. 6, 2012	x	x	un	0	x	x	x	✓
Bnu	Bnulibrary	x	✓	x	x	Nov. 6, 2012	✓	✓	un	30	x	x	x	x
Csu	–	x	✓	x	x	un	✓	x	un	0	x	x	x	✓

For ease of presentation, all categories of primary characteristics are extracted and coded in Table 1 as “✓” for item reported or “x” for item not reported.⁵

A template code-sheet was developed based on the 14 key elements for the data collected in this study (Table 1). Characteristics were classified into two broad categories, namely basic features/functions and advanced functions. Table 1 allows a general understanding of the profiles of academic libraries using WeChat official accounts. More detail is provided below.

THE USAGE OF WECHAT IN LIBRARIES

BASIC FEATURES AND FUNCTIONS

Most library websites (64%, 7/11) conspicuously display a WeChat icon on the right or upper right in a fixed position or a floating picture frame. The remaining four libraries do not place the icon on the homepage. Six libraries issued a notice about establishing WeChat official accounts on their webpages. Five libraries display WeChat icons on their homepages and published news to inform users of this service. One interesting finding is that a menu of WeChat publication information campaigns has been added under the navigation bar for the service at Sdu Library, which indicates they attach great importance to the WeChat application. The official accounts of all the libraries in this study, excepting Csu Library, have IDs. Regarding account logos, nine are the library badge or emblem, while the remaining two are custom logos. Ten libraries have added introduction items, which describe summaries, or promote resources and reference services. Tencent has only authenticated 36.4% (4/11) of the libraries' official accounts. The WeChat official accounts were established at Buaa and Bnu Libraries on November 6, 2012. Eight libraries developed official accounts in 2013. It cannot be established when Csu Library opened its account because there was no opening announcement, message history, or response from reference staff to questions asked through their WeChat official account. When applying for the account, 82% (9/11) include a welcome message when applying for account procedures, and 18% did not. An example of message content is “Welcome follower...library WeChat Official Account, we will provide you with the latest various news and...” Only the Bnu Library WeChat official account asks about the patron in the welcome information, which has been written to obtain data

needed for push group information targeted at different user types (undergraduates, graduates, international students, staff, and external users). Responding is optional. The results of this study also indicate that no libraries used private communication through the official account to understand user data such as type, research orientation, and other public information of the patron. Thus, it is difficult to provide personalized service. The researchers' interaction with the services reveals that Xmu Library is the fastest—the librarian responded within 30 min—followed by Pku Library—response received within 2 h—and Jlu and Ruc Libraries—responses received the next day (within 24 h). The remaining seven libraries did not respond promptly to users' messages. This highlights a potential issue, in that librarians were still pushing information for resources and services during the no-response period, indicating that while they were logged into the official account management system and could see users' messages, they did not reply. The number of push information messages is one to six item(s) at a time, one showing “view all,” and more than one referring to group messages (see subsection “Quality appraisal” for more detail). The minimum number of push information messages is 0 and the maximum is 37. Four libraries had no push information during the period their accounts were followed during the second phase of the data collection procedure.

This section provided basic information, features, and basic functions of WeChat, which are relatively easy to implement, but very important. The following section summarizes and analyzes the advanced functions.

ADVANCED FEATURES AND FUNCTIONS

NAVIGATION FEATURES

In the absence of human intervention, the system automatically responds to information input by users. If the navigation service is not provided, the user does not know what words, letters, or numbers to enter to get information, and could be unsure of how to proceed, especially when using the system for the first time. This means that automatic greetings by subscriptions saying, “We welcome you to use or follow the library Official Account,” are meaningless, because no instruction is provided. Six libraries provide navigation services. Table 2 provides more detail.

SELF-INQUIRY INFORMATION

Users enter text, letters, or numbers in the dialogue box according to navigation instructions for notices, talks, and seat information inquiries. The WeChat official account management system automatically replies according to set modules, such as “announcement,” “lecture,” or “seats” when followers input the words or letters in the chat window. If the system does not match the information input by a user, librarians can send a one-to-one communication. Six libraries add self-inquiry information capabilities for users to conveniently access the latest news and events or common aspects of the library through the WeChat App.

⁵ Abbreviations: U, university library located; I, icon in library homepage; V, verified account; O, opening announcement; T, time to provide service; W, welcome message; P, patrons type; S, reply to users' advisory speed; B, the volume of broadcast push information; N, navigation service; SII, self-inquiry information; SEF, self-service functions; K, keyword-identified reference auto-responders; Un, unknown University; Thu, Tsinghua University; Pku, Peking University; Xmu, Xiamen University; Nju, Nanjing University; Sjtu, Shanghai Jiao Tong University; Sdu, Shandong University; Ruc, Renmin University of China; Jlu, Jilin University; Buaa, Beijing University of Aeronautics and Astronautics; Bnu, Beijing Normal University; Csu, Central South University.

Table 2

A custom message received when following the library official account and navigation service.

Library	Welcome message upon following the account	Navigation features (instruction)
Sdu Library	Welcome follower...! Dear users, need to know something? Give me a hint/tip on opening hours or circulation. Please enter what content you want to know more about, or reply "daohang" (note: Navigation Pinyin) to understand more about all the functions.	Circulation: borrowing service Visit: Understanding learning spaces Mobile: Learn more about the mobile library Notice: Learn the latest notification Activities: Learn more about the library's latest events
Jlu Library	Hello, welcome...If you have any questions on using the library, an inquiry service is available through the QQ group, reference desk, or homepage (author added: lists the three patterns). Enter "help" to know more. Numbers 1–6 are instructions.	1. About the library 2. Opening hours 3. Number and length of loans 4. Search catalogue and check my loans by signing in "My Account" 5. Collection location 6. Interlibrary loan service Note: Numbers 1, 2, 3, 5, and 6 introduce you to using the library. Numbers 2 and 3 are for the number and length of loans for different users. Number 4 is the URL from which to download and install bibliographic search software, not the OPAC system integrated into the WeChat platform. Enter the following for help: 1: Common information, enter Chinese words or phonetic abbreviation: hours, collections layout, news, electronic resources, seminars, training, teaching, lecture hall, donations, and other general information inquiries; 2: Frequently asked questions about borrowing, keywords including recall, renewals, due for return reminder, all circulation descriptions. 3: Search catalogue and check my loans through university ID card. Enter appropriate instruction format such as keywords, title, or author to inquire about books. Other formats are not recognized. 4: Query popular journals. Enter 2, 3, or 4 to learn more about set keywords. You do not need to enter these numbers, but can also obtain self-inquiry information by settled keywords or self-service function, like renewal, recall. To display the functions list and information inquiry keywords, enter "h." Announcements, seminars, training, seats, and collection inquiries. Keyword-identified reference auto-responders were added on December 8, 2013. Command code is ZX + space + consulting content. Users can automatically receive reference responses. 00: Recent seminars 11: Latest online bibliographic databases TSG: university ID card account for binding; only for first time log in/use. CX: Check my loans XJ: Renewals CS: Catalogue search Custom menus: my loan information, my appointment lectures, my assistant librarian, purchasing suggestions, my appointment space (use these functions. First link to your identity information through OPAC hyperlinks for identification); Siyuan explore: resources retrieval, journals navigation, and FAQs. These are hyperlinks to the corresponding section of the library website pages. Wikipedia quiz uses an auto-response feature and keywords, similar to an intelligent robot service. News: news announcements, training seminars, weekend theater, and borrow ranking.
Thu Library	Welcome...What can I do for you? Regularly publish newspapers Library services interactive Service navigation Enter numbers 1–5 for more details.	
Xmu Library	Welcome information, services offered, suggestions and comments, and send a message to the mailbox. This is important for collecting feedback through the library WeChat official account. Enter "h" or "help" to view more details.	
Nju Library	Welcome information Features Navigation	
Sjtu Library	No automatic greeting	

SELF-SERVICE FUNCTION

Here, users self-check loans, search the catalogue, recall, renew loans, report losses, change passwords, and other services. These functions can be attributed to self-managed functions, because they pertain to OPAC capabilities and are integrated into the WeChat official account platform. Only three libraries include a self-service process. These functions are implemented by using the application programming interface (API) provided by the Tencent WeChat platform through programming design. Thus, the technical requirements may be too advanced for librarians, which could be why fewer libraries offer the service.

KEYWORD-IDENTIFIED REFERENCE AUTO-RESPONDERS

The official account sets keywords and answers to frequently asked questions, which the system automatically matches to respond according to a user's input. The difference between information inquiries and keyword-identified auto-responses is not obvious. However, Xmu Library adds a consulting auto-response service, which requires users to enter "zixun" (advisory Pinyin) or "zx" plus keywords for recognition. Two libraries have no navigation service or self-inquiry information, but do provide a consulting automatic reply. For example, after the author entered keywords, Buaa Library official account replied, "Do not worry, teachers will reply to your message." Csu Library uses a fixed response:

"If you did not see my reply, do not be sad, I'm just napping," to which the researcher replied: "Well, you take a break." After a few days—the librarian had not responded to the query—another message was sent: "Have you not woken up?"

The three functions described above are self-service or auto-response features available through the WeChat App. These include automatic greetings on becoming a follower, after-hours auto-response messages, keyword-identification auto-responses, self-inquiry information, and self-service functions.

Based on the analysis of the basic and advanced features of library WeChat official accounts, the purposes for using various features can be classified as shown in Table 3.

Using four types of interaction on libraries' SNSs (Chen, Chu, & Xu, 2012; Zhang et al., 2013), a classification of Web2.0 applications for libraries (Chua & Goh, 2010), and a combination of Han and Liu's (2010) examination of the main purposes and features of using Web2.0 tools and Chu and Du's (2013) purposes for using social networking tools, we delineated 5 categories and 26 items by which to analyze interactive content types and purposes of library WeChat official accounts. Since there are fewer one-to-many messages in one month, the authors also reviewed message history before November 20, 2013 for content classification, thus avoiding omitting important content and columns.

The development of the checklist was adapted from and synthesized ideas from the literature above. The checklist is a list of features and criteria that emerged from the content analysis of literature pertaining to social media in libraries and the unique features of WeChat. The checklist—as instrument—can be used to evaluate social media application in the library, indicate the status and purpose of applications, and collect research data.

Table 3 explains the five types of interaction. Unlike Facebook, Twitter, Sina, Tencent Weibo, and Q-zone, response record and follows as well as the content of a user's exchanges cannot be seen by other users in WeChat official accounts, even though it is within the contacts. Only librarians can see these items after logging into WeChat to ensure privacy. Second, this platform broadcasts public information to all followers; however, if the user responds through a video call, real-time voice intercom, or a picture or text message it reverts to a one-to-one model where the conversation is between the librarian and responder, not among users. The content analyzed in this study is broadcast by librarians, as we cannot analyze the content of users' interactions with library official WeChat accounts.

To determine libraries' interactions with users on WeChat, the sampled one-to-many information was summarized as a percentage based on interaction type (see Table 4). Table 4 shows that more than 90% of the sampled data is information dissemination, except for new book listings. Self-inquiry information services and keyword-identified auto-responses account for more than half the sample. As such, libraries use the unique features of the WeChat official account relatively fully. Meanwhile, self-service functions account for 27.8% of the sample, as it is difficult to implement this feature. Overall, libraries have substantially implemented the self-service feature, although it is not as prominent as information dissemination. In comparison, communication between libraries and users (36.4%) is not as frequent as information dissemination and self-service features. In addition, the authors observed that only text messages are used, while voice/video messaging and sharing links or photos have not been explored. Like YouTube, voice/video messaging can effectively be used to share tutorials, user guides, lectures, and for promotional advertising of library services. Similarly, image/photo sharing can be used for sharing pictures and images of library personnel and events, that is, seminars, conferences, and exhibitions. This is also another medium for sharing rare picture collections and promotional flyers with library users, similar to Flickr (Shafique & Riedling, 2013). Finally, the results for knowledge sharing and information acquisition interactions are similar. The authors note that knowledge sharing includes different types of interaction, such as memories of the library, biographies of excellent scholars, and special collections exhibitions.

Table 3
Five types of interaction on libraries' WeChat.

Purposes	Description/Definition	Sample references
Information acquisition	Harvesting information (feedback, suggestions) from individual users to improve library services and academic research.	Welcome to the survey; Welcome to contribute\comments\suggestions on the use of functions of the Library WeChat Official Account; Journal subscriptions are works in progress. If you have recommended journals, contact me directly. Call for WeChat Prizes
Information dissemination	Promotion of library events and dissemination of news	New online resource listings; Borrowing regulation adjustments for the Winter 2014 vacation
Knowledge sharing	Librarians or users share information resources with others	My college, my library: library memories; Guide on WeChat usage; Sharing videos on activities
Communication	For any questions or concerns regarding using the library, please consult a librarian.	Things on Weibo; Tips for Library Design Competition Submission
Self-service	Self-inquiry information, self-service functions, and keyword-identified auto-responses	The remaining seats enquiry; Check my loan; Frequently asked questions

Note: The five types of interaction are not exclusive to one another, which mean one item could contain more than one type of interaction.

The following is a representative sample of content and purpose:

The Thu Library has rich content, such as memories of the library, interviews with scholars, and special collections. The content of Xmu Library's account includes instructions on database usage, guides on library usage, video sharing (except for information dissemination), and a feature to apply for reading space lockers through the WeChat official account. Thu and Pku Libraries send notifications on new and recommended books. For Xmu and Thu Libraries, the last push notifications were instructions on WeChat usage and calls for papers with lucky draw prizes. Furthermore, they constantly push usage tips and gather recommendations to familiarize users with the operation, enhance user experience, and engage users in participating in the library scene.

QUALITY APPRAISAL

The study specifies six categories on which to evaluate the quality of interaction content delivered by WeChat, namely volume of information, information content quality, concordance rate, frequency, self-services, and basic features.

In addition, content quality is a measure of content functionality. Based on Chua and Goh's (2010) quality evaluation framework for library websites, content functionality and service provision can be conceived of in terms of six dimensions: timeliness, usefulness, usability, interactivity, playfulness, and aesthetic appeal. For timeliness, information is current, secure, and timely. Usefulness refers to the understandability and appropriate volume of information provided. Usability is affected by WeChat navigation or menu organization to support browsing, searching, and keyword identification. This dimension refers to the ease and speed with which users can use WeChat by providing guidelines or help information or concise menus. Interactivity is the extent to which users can exchange information and librarians can respond to users' questions promptly or, if not, through auto-responses by WeChat. Playfulness stems from the devices that appeal to users by offering fun and enjoyment. Examples include browsing information for pleasure in accordance with the language and psychology of users, and occasionally using online slang. Aesthetic appeal is the use of fonts, colors, layout, and graphics in WeChat to attract users. If the provided information is deemed unattractive, users are unlikely to remain there for long, regardless of content quality or usefulness. To effectively meet the different information needs and mounting expectations of users, Library WeChat official platforms have to maintain high service quality, and ongoing maintenance and updates.

The concordance rate is the proportion of the number of total push information and information similar to that on the library website. A

Table 4
Content on libraries' WeChat: 26 interactions.

Purposes/Content classification	N.	P
<i>Information acquisition</i>		
Access to users' ideas and comments on WeChat	2	18.2
Questionnaire	2	18.2
Purchase suggestions	1	9.1
<i>Information dissemination</i>		
Library news	10	90.9
Publicizing events	10	90.9
Publicizing lectures	10	90.9
Latest trial materials	10	90.9
Latest acquisition resource	10	90.9
New book notice	2	18.2
<i>Knowledge sharing</i>		
Sharing links	0	0
Sharing photos	0	0
Sharing videos	1	9.1
Instructions/guides for library usage	1	9.1
<i>Knowledge sharing (continued)</i>		
Recommended reading	2	18.2
Instructions for database usage	1	9.1
Instructions for WeChat usage	2	18.2
One's memories/history of the library	1	9.1
Biography of excellent scholars	1	9.1
Special collections exhibition	2	18.2
<i>Communication</i>		
Interaction with users online	4	36.4
Reference services on WeChat	4	36.4
Text-based chat	4	36.4
Voice/Video chat	0	0
<i>Self-service</i>		
Self-inquiry information	6	54.5
Self-service function	3	27.8
Keyword-identified auto-response	6	54.5

Note: N.: number of libraries; P: percentage of total.

concordance rate of 100% indicates that push content is entirely from library website columns.

Frequency equals the total volume of information divided by 30, indicating information within 30 days of the push frequency. This does not mean that a higher frequency improves information disseminated. A higher frequency may cause interruptions and annoyance, which is why Tencent restricts clients to only one push message a day. Sjtu, Buaa, and Csu Libraries' WeChat official accounts do not have one-to-many message records and no history messages; thus, they are not summarized. Sdu Library pushed no one-to-many messages during certain periods: the library pushed 15 items 15 times between September 9 and November 15. Of these push notifications, 12 originated from the library website news and events, which is a concordance rate of 80%. Browsing various website pages, the researchers found that the last release was also November 15. The date and content were the same, indicating slower updates.

The findings in Table 5 reveal that one-to-many information is sent every 2.5 to 5 days on average. Some libraries release information about new collections and lists, or publicize library events and news through WeChat one week to one month later than on the library website. Lack of timeliness, poor communication may cause user dissatisfaction.

Table 5 lists three objective quality indicators, namely number, concordance rate, and frequency. Volume of information, self-services, and maintaining basic features are as in Table 1. In addition, future work will investigate a large number of users across the six dimensions of content quality measurements for the sake of objectivity. Otherwise, researchers' subjective judgment and feelings may be infused into the evaluation process of this paper.

Although these indicators have no figure range, it is important when they are combined to evaluate the library's service quality. Overall,

a higher service quality was found for Xmu, Pku, Nju, Sjtu, Thu, Rcu, and Bnu Libraries' official accounts based on the above mentioned dimensions. However, it was also determined that there is still some way to go.

DISCUSSION

Overall, eight (72.7%) libraries reported at least seven of the 14 elements. Among the ten basic functions, where the minimum amount of basic information services and features is two and the maximum is nine, 11 libraries displayed significant differences. Only two libraries utilize all four advanced features—navigation service, self-inquiry information, self-service functions, and keyword-identified reference auto-responders—and three libraries provide self-service functions. Although all samples are "985 Project" universities, WeChat is currently not widely applied as a new mobile social media tool. Some libraries have not applied for WeChat official accounts; perhaps because their universities have official accounts, for example, the Nankai University WeChat official account often publicizes library-related news and events.

Four libraries do not include the WeChat icon on their homepages, which could be because of webpage changes. Here, as a form is added to the page, Cascading Style Sheet (CSS) code could result in a disorderly display in different browsers. This is unlikely to attract user attention and will make the site seem unprofessional; after all, users often use libraries' official websites to retrieve online collections. The WeChat QR code is displayed at the bottom of Sjtu Library's main page and is difficult for users to find. After completing the draft paper, the authors observed that a new version of the homepage had been tested from the library's WeChat official account. In the new version, the WeChat QR code was displayed on the right side of the homepage with Sjtu Library's Sina Weibo link.

By analyzing announcements, we discovered that the main purposes for using WeChat official accounts are to expand reciprocal communication channels and to provide convenient access to information and real-time interaction with users. Meanwhile, users can give feedback on various problems encountered when using the service. Essentially, libraries utilize WeChat to release news and virtual reference services through text, voice intercom, or voice messages.

The official account for Xmu Library currently boasts more than 500 users, while Jlu Library has more than 2300 users through WeChat reference. However, Tencent has not yet authorized a verified account for either library. Although the WeChat icon or logo is not on Ruc Library's website, it has been certified, and has reached 3126 users. This indicates that other promotional approaches are working well, such as the reference desk or distribution of promotional materials to reach the wider user community. If accounts are not authenticated for a long time, the credibility of information released, the enthusiasm of user interaction, and user anxiety regarding information security and privacy due to representation of the institution's authority in the minds of users will be influenced.

User data collected from the interaction between users and WeChat can be used to classify users into different groups, and then provide them with personalized one-to-many information services grouped by characteristic. The surveyed libraries do not use this service much, indicating that the capability of group subdivision within social media is not fully utilized to provide accurate, targeted information services. Meanwhile, librarians should be careful and appropriate when developing this function so that they do not seem to prey on user privacy (Connell, 2009). On average, there is 93% predictability across all users through data analytics (Barabási, 2010).

With regard to response time, some libraries were quicker than others. For example, we noted that the reference staff at Bnu Library pushes new resources on Saturdays, during which time there was no response to our queries. Perhaps, there are so many user reference items that librarians' responses are an urgent and important advisory priority. On the other hand, the WeChat official account is currently limited to

Table 5
Three objective quality indicators.

Library	Concordance rate	The number of times	Frequency
Thu Library	56.8% (21/37)	12	0.4 (2.5 days on average)
Pku Library	77.8% (7/9)	9	0.3 (approximately 3 days on average)
Xmu Library	50% (14/28)	7	0.23 (approximately 4 days on average)
Nju Library	100% (12/12)	7	0.23 (approximately 4 days on average)
Sdu Library	80% (12/15)	0	0
Rcu Library	57.1% (4/7)	6	0.2 (5 days on average)
Jlu Library	77.8% (14/18)	9	0.3 (approximately 3 days on average)
Bnu Library	93.3% (28/30)	12	0.4 (2.5 days on average)

only one administrator at a time, so more than one reference librarian cannot simultaneously provide reference services. This may be another reason for delayed or no responses.

This basic information comprises important methods to publicize the library and attract more subscribers. Users can easily search and identify library WeChat official accounts; thus, it is essential to manage and maintain them.

Instructions and a menu are types of navigation services. The advantage of a menu is that it is clear and concise regarding the provision of services and features, and does not require inputting instructions for interaction. The Rcu Library official account added three custom menus in March 2014 (although it did not include advanced features during the data collection period). Functions include reserving seats and research rooms online through the university ID card, library catalogue search, and news and opening hour inquiries through the WeChat App. This reflects the idea of user-centered service, and enables constant improvement of service quality. Similarly, Sjt University's official WeChat account is a service account; users can enter information or voice messages for consultation and select any of the menu's various capabilities (see Table 2). As seen for Rcu and Sjt Libraries, subscription accounts and service accounts both include setup menus similar to webpage navigation methods.

As shown in Tables 3 and 4, these findings imply a shift in WeChat mobile social media, which were previously found to be different (Baro et al., 2013; Chen et al., 2012; Chu & Du, 2013; Zhang et al., 2013). WeChat is helpful in self-servicing users, as it can generate auto-responses using keyword recognition (FAQ) in real time, equivalent to a reference librarian, especially when users interact with social media. It can also be utilized for catalogue searches, to check loans, renewals, recalls, receive real-time notification of events, review history messages, inquire about talks or vacant seats, and to share knowledge. Libraries can also use API and custom menus provided by WeChat to integrate library application systems and various businesses, and position the library official account as the library's mobile portal. Other applications can be integrated including OPAC, digital resource database searches, seat management systems, seat and room reservations, barrier access controls, etc. This can achieve a high level of interaction and self-inquiry information functions. Users and librarians can also communicate one-to-one through voice intercom or video in the high-speed mobile internet era. This is more lucid and intuitive than text responses, and more similar to in-depth interview exchanges. In addition, with the development of the WeChat official account service itself, self-learning artificial intelligence technology may be added enabling the auto-response feature to deliver a quality user experience. These features and services comprise the biggest differences and advantages compared to other social media.

Table 4 summarizes additional purposes for using WeChat, which are similar to other social media tools, including disseminating information on new collection lists, publicizing library events and news (e.g., events alerts, library updates, seminars, training courses, exhibitions, competitions, talks, tutorials), and providing online reference services. Most importantly, however, users browse the received information in real time with vibration/sound reminders, and automatically store it in their smartphones for future access.

The study also found that most libraries, currently, do not make full use of WeChat's capabilities. Many libraries are only in the initial stage of implementation. For example, Csu Library's WeChat account is at a standstill: neither providing services, nor promptly responding to users' questions, which may lead to a loss of users and ultimately to an inactive, useless account. If WeChat official accounts are not operated to a sufficient standard, they may as well not exist in the eyes of the user. Attracting librarians and users to participate and actively promote the service is important. On the other hand, most libraries constantly try to add new features and fully exploit WeChat's capabilities. They can integrate the service and information technology, and can serve as a model for other libraries to follow by providing best practices. For example, Xmu Library integrates a seat management system into the WeChat official account via API enabling users to check remaining seats and informing them whether they can use the library. They can determine their best option before visiting the library, particularly during exam period.

The survey also indicates that the WeChat official accounts of 11 libraries in this study do not have an English version, although WeChat has support for users in many countries. This is detrimental to international student inclusion. It was also observed that there are no one-to-many voice/video messages, only text-based messages. This can be attributed to a complex production process, which necessitates professional skills before uploading to WeChat for release. In contrast, the user can easily send voice or video information to the official account, by merely holding the button to send a voice recording. Therefore, professional librarians are needed to manage and maintain the WeChat platform, which may explain why only 11 libraries have implemented this service so far. For example, Liu, from Bnu Library, is specializing in delivering WeChat services to users.

An important issue in this discussion involves the library image, in other words, people's perceptions of libraries and librarians. Only a few libraries have managed to build a brand name and be recognizable worldwide (Garoufallou, Siatiri, Zafeiriou, & Balampanidou, 2013). Rossiter (2008) and Potter (2012) discussed the importance of branding in libraries. Branding is also very important on social media, as it enables libraries to reach a wider audience. This can help libraries receive more financial support from the nation or university.

Push information sent from WeChat may differ from information on the library website. Importantly, information appropriate to users is shared and disseminated through WeChat official accounts for marketing purposes and to post announcements that are potentially interesting to subscribers, such as feedback and suggestions, common tips for using the library, famous scholars, database introductions, tips, exam tips, important news, and season's greetings. This enhances user interaction and communication, and increasing satisfaction with the service. Frequency of push information should be appropriate, although there is no exact figure.

LIMITATIONS

This study is limited in several ways. Information sent to the WeChat platform can only be browsed by librarians after Login. Therefore, we could only see the information disseminated by librarians, not that between users and librarians, although the authors subscribed to the

entire library official account to gain an interactive experience. In addition, the sample comprised only 39 libraries; thus, the results may not represent all academic libraries in China. It would perhaps be useful to examine other types of libraries alongside academic ones.

CONCLUSION

This investigation outlined the application of official WeChat accounts in the top 39 university libraries in China. The focus was on overall status, features, potential issues, content, purposes, and quality dimensions. The study provided these libraries with helpful information to better understand their peers' application of WeChat technology. In addition, other interested groups can use these research results when planning WeChat for their libraries. Furthermore, researchers and information professionals may find this research useful if they intend to conduct research relating to emerging mobile social media in libraries.

As mentioned in the analysis, on the one hand, most libraries are in the initial stage of WeChat application. It is hoped that libraries comprehensively utilize WeChat's capabilities such as self-services, integration with various library information systems, one-to-one communication (e.g., online reference services by text, voice message, voice intercom, or even video), and one-to-many communication. On the other hand, at the time of this paper's completion, we reinvestigated our sample and observed that most libraries had already improved and added many functions to their accounts; thus, they had evolved over time. They stay abreast of technology development through critical thinking, leadership support, librarians' literacy, and improvement of technical knowledge. In addition, another nine academic libraries began providing a WeChat service during the period between delivery and revision. More than half the "985 Project" libraries (20/39) focus on using mobile social media tools. This trend suggests it might be inevitable for libraries to use WeChat for their services such as offering responses to inquiries, self-services, marketing and publicity, improving reference services, and enhancing knowledge sharing activities.

While often used in China's top academic libraries, WeChat official accounts are somewhat less prevalent compared to different parts of the world on the use of other social media tool applications such as Facebook, MySpace, and Twitter to promote services, collection, events, and resources (Aharony, 2012; Boateng & Liu, 2014; Chua & Goh, 2010; Han & Liu, 2010; Linh, 2008; Mahmood & Richardson, 2011; Saw et al., 2013). Indeed, libraries adopting this emerging technology will need time to overcome the challenges or barriers mentioned. This distinguishes the App from those SNSs launched earlier, which have already extensively been used in libraries. Similar to Facebook, WeChat may prove to be a successful outreach tool (Vassilakaki & Garoufallou, 2014). Therefore, it is important that librarians understand how to best harness the platform to enhance library service practices with the critical, creative, collaborative, and communicative capabilities required in their professions (Zohoorian-Fooladi & Abrizah, 2014). Libraries should take advantage of the plentiful, freely accessible tools to reach this growing and untapped area. Future work in this area will examine cognition and attitudes toward libraries using WeChat across different user types, such as librarians, faculty, and students (including international students).

REFERENCES

- Aharony, N. (2012, June). Facebook use in libraries: An exploratory analysis. *Aslib Proceedings*, vol. 64, No. 4. (pp. 358–372).
- Arif, M., & Mahmood, K. (2012). The changing role of librarians in the digital world: Adoption of Web 2.0 technologies by Pakistani librarians. *The Electronic Library*, 30(4), 469–479.
- Ayu, A.R., & Abrizah, A. (2011). Do you Facebook? Usage and applications of Facebook page among academic libraries in Malaysia. *The International Information & Library Review*, 43(4), 239–249.
- Barabási, A.L. (2010). *Bursts: The hidden patterns behind everything we do, from your e-mail to bloody crusades*. Penguin.
- Baro, E.E., Ebiagbe, E.J., & Godfrey, V.Z. (2013). Web 2.0 tools usage: A comparative study of librarians in university libraries in Nigeria and South Africa. *Library Hi Tech News*, 30(5), 10–20.
- Bhatti, R., & Amjad, A. (2013). Approach towards social media of LIS students Islamia University, Bahawalpur. *Pakistan Library & Information Science Journal*, 44(2).
- Boateng, F., & Liu, Y.Q. (2014). Web 2.0 applications' usage and trends in top US academic libraries. *Library Hi Tech*, 32(1), 120–138.
- Chen, D.Y.T., Chu, S.K.W., & Xu, S.Q. (2012). How do libraries use social networking sites to interact with users. *Proceedings of the American Society for Information Science and Technology*, 49(1), 1–10.
- Chu, S.K.W., & Du, H.S. (2013). Social networking tools for academic libraries. *Journal of Librarianship and Information Science*, 45(1), 64–75.
- Chua, A.Y., & Goh, D.H. (2010). A study of Web 2.0 applications in library websites. *Library & Information Science Research*, 32(3), 203–211.
- Connell, R.S. (2009). Academic libraries, Facebook and MySpace, and student outreach: A survey of student opinion. *Portal. Libraries and the Academy*, 9(1), 25–36.
- Counts, S., & Fisher, K.E. (2010). Mobile social networking as information ground: A case study. *Library & Information Science Research*, 32(2), 98–115.
- Ding, Q. J. (2010). Patrons services in academic service based on "RenRen.com". *Research on Library Science*(4), 84–85.
- Du, P.P., Guo, Q., Li, Y.K., et al. (2014). Interactive promotion service of discipline information based on social media networks. *Library and Information Service*, 58(2), 84–90.
- Garoufallou, E., Siatri, R., Zafeiriou, G., & Balampanidou, E. (2013). The use of marketing concepts in library services: A literature review. *Library Review*, 62(4/5), 312–334.
- Han, Z., & Liu, Y.Q. (2010). Web 2.0 applications in top Chinese university libraries. *Library Hi Tech*, 28(1), 41–62.
- Hao, L.M. (2013). Reading on the side—Public library micro-channel platform services. *Journal of Modern Information*, 33(11), 159–161.
- Harinarayana, N.S., & Raju, N.V. (2010). Web 2.0 features in university library web sites. *The Electronic Library*, 28(1), 69–88.
- Huang, S.M. (2012). Analysis of library use microblog features and development strategy. *Journal of Academic Libraries*, 1, 78–83.
- Huang, H.M. (2013). The research of cheap and real-time reference service. *Research on Library Science*, 1, 96–98.
- Hughes, A.M. (2013). Academics in the UK use social media to enhance traditional scholarly reading. *Evidence Based Library and Information Practice*, 8(4), 145–147.
- Jahan, I., & Ahmed, S.Z. (2012). Students' perceptions of academic use of social networking sites: A survey of university students in Bangladesh. *Information Development*, 28(3), 235–247.
- Jiang, B., & Qin, Y.M. (2013). Design and implementation of mobile library App service system based on WeChat. *Journal of Modern Information*, 6, 41–44.
- Kim, Y.M., & Abbas, J. (2010). Adoption of Library 2.0 functionalities by academic libraries and users: A knowledge management perspective. *The Journal of Academic Librarianship*, 36(3), 211–218.
- Kong, Y., Liao, Y., Zi, Y., et al. (2013). Research of library mobile information service based on Weixin public account. *Journal of Intelligence*, 32(9), 167–170.
- Kong, Y., Liao, Y., Zi, Y., et al. (2014). Design and implementation of WeChat service platform for library. *Library Tribune*, 2, 90–95.
- Li, C. (2012a). Analysis on the status of library microblog in China. *Library Journal*, 2, 24–28.
- Li, J.B. (2012b). Study on the application of social network in academic library services. *Library Tribune*, 32(6), 170–174.
- Linh, N.C. (2008). A survey of the application of Web 2.0 in Australasian university libraries. *Library Hi Tech*, 26(4), 630–653.
- Liu, S. (2008). Engaging users: The future of academic library web sites. *College & Research Libraries*, 69(1), 6–27.
- Liu, Y. (2012). Analysis on the utilization of microblog in expanding reader service of university library. *Library Work and Study*, 6, 121–124.
- Mahmood, K., & Richardson, J.V., Jr. (2011). Adoption of Web 2.0 in US academic libraries: A survey of ARL library websites. *Program: Electronic Library and Information Systems*, 45(4), 365–375.
- Mansor, Y., & Idris, S.R.A. (2010). Perceptions, awareness and acceptance of library 2.0 applications among librarians at the International Islamic University Malaysia. *Webology*, 7(3).
- Ministry of Education of the People's Republic of China (2012). Higher education schools list approved by the Ministry of Education. Retrieved from. http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_229/201205/xxgk_135137.html
- Potter, N. (2012). *The Library Marketing Toolkit*. London: Facet.
- Rossiter, N. (2008). *Marketing the best deal in town: Your library. Where is your purple owl?* Oxford: Chandos Publishing.
- Saw, G., Abbott, W., Donaghey, J., & McDonald, C. (2013). Social media for international students—It's not all about Facebook. *Library Management*, 34(3), 156–174.
- Shafique, F., & Riedling, A. (2013). Survival avenues for Pakistani libraries in the era of emerging technologies: Adoption of Library 2.0 and Library 3-D. *The Electronic Library*, 31(4), 412–432.
- Si, L., Shi, R., & Chen, B. (2011). An investigation and analysis of the application of Web 2.0 in Chinese university libraries. *The Electronic Library*, 29(5), 651–668.
- Skuse, A. for CNN (2014). WeChat: The Chinese chat app stealing Weibo's thunder. Retrieved from. http://edition.cnn.com/2014/02/27/business/tencent-WeChat-unseats-sina-weibo/index.html?hpt=hp_c5
- Tay, A.C.H., Glass, G., & Chew, S.W. (2013). Using FourSquare. Check-ins are not just for books! *Library Management*, 34(6/7), 433–437.
- Tencent (2013). Tencent announces 2013 third quarter results. Retrieved from. <http://www.tencent.com/zh-cn/at/pr/2013.shtml>
- Vassilakaki, E., & Garoufallou, E. (2014). The impact of Facebook on libraries and librarians: A review of the literature. *Program: Electronic Library and Information Systems*, 48(3), 226–245.

- Vecchione, A.E., & Mellinger, M. (2011). Beyond FourSquare: Library treks with SCVNGR. Retrieved from. http://works.bepress.com/amy_vecchione/23
- Wang, Y., & Hong, B. (2013). The application of WeChat in libraries. *New Century Library*, 9, 45–49.
- WeChat (2013). WeChat—The new way to connect. Retrieved from. <http://www.WeChat.com/en/>
- Wei, M.G. (2013). The research of Micro-channel public platform in libraries. *The Library Journal of Shandong*, 5, 46–49.
- Xiao, J.H., & Huang, L.H. (2013). Research on information service mode of the library based on WeChat. *Journal of Modern Information*, 6, 55–57.
- Xie, Y.L. (2013). A study of information services of university libraries based on Renren websites. *Library Research*, 1, 92–94.
- Xu, C.X., & Wei, Q.Y. (2013). The application and service of WeChat in academic libraries. *New Century Library*, 10, 43–47.
- Yang, Y., & Li, E.K. (2012). Research on the application situation of Micro-Blog in domestic library. *Library Development*, 2, 86–89.
- Yu, L., Asur, S., & Huberman, B.A. (2011). *What trends in Chinese social media.* (arXiv, preprint arXiv:1107.3522).
- Zhang, N., & Bian, L.M. (2013). The application of WeChat in library information services. *Library Research*, 43(5), 83–85.
- Zhang, Q.N., Lian, P.P., & Dai, L.Z. (2013). On university library using of SNS to interact with readers: A survey research based on “RenRen Net”. *Journal of Intelligence*, 32(7), 179–182.
- Zohoorian-Fooladi, N., & Abrizah, A. (2014). Academic librarians and their social media presence a story of motivations and deterrents. *Information Development*, 30(2), 159–171.