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Understanding User-Librarian Interaction Types in Academic Library Microblogging: A Comparison Study in Twitter and Weibo

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Abstract

This research examined the ways in which academic librarians and users interact when using social media tools such as Twitter and Weibo as well as end-users' and librarians' perceptions of the types of interaction through social media. The study conducted an analysis of 1,600 microblog posts sampled from twenty university library Weibo (Chinese Twitter) sites and twenty library Twitter sites in English-speaking countries.The results were compared using Chi-Square analysis. Results indicated that at present academic librarians in English-speaking countries use post information relevant to the library (news and events) and respond to information/research inquiries. And academic librarians in China are likely to use Weibo to communicate with users and to

disseminate library news. Given the lack of previous research on how social media such as micro-blogging in general facilitates communication between librarians and library users in academic libraries between in English-speaking countries and China, this study provides valuable information concerning librarians' and end-users' interactions of information/knowledge sharing activities, which will enable libraries to be better positioned to promote user engagement through SNS usage.

Keywords
Social networking, interactions, academic libraries, Twitter, Weibo

Introduction

With continuing increases in the provision of digitized collections, eBooks, eJournals, and on-line databases on the part of libraries, there is an equally increasing demand by library end-users for academic libraries to provide assistance and instructions on how to access these resources (Crump & Freund, 2012). The response of libraries to this demand has been an increase in the number of libraries using social networking sites to promote both in-house and on-line access to these resources, which has facilitated an increase in information/knowledge exchanges between librarians and library users (Huang, Chu, & Chen, 2015). Knowing how to use social media tools is an opportunity for library practitioners to keep abreast of new technologies. The proper use of Social Network Sites (SNSs) in libraries requires intensive understanding of users' needs and careful planning to enhance and renew of existing services (Anttiroiko & Savolainen, 2011). Librarians can take advantage of SNSs to facilitate resource sharing and direct users to these valuable online or in-house resources.

Among the SNSs, Twitter and Weibo are recognized as the only microblogging tools in the top 10 list of most popular Social Networking tools with hundreds of millions of users globally (Ballve, 2013). In China, Weibo is leading the microblogging market and attracted over 300 million users in 2012 (Zhao, 2013; Zhao, Zhu, Qian, & Zhou, 2013).

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With the increased global popularity of microblogging, Twitter and Weibo has become widely used in academic libraries (Huang et al., 2015). Colleges and universities have started serving students' needs in a global, culturally diverse, and technological society, and have produced graduates with the knowledge and the disposition to be "global citizens" (Pashby, 2011; Schattle, 2008). Social Networking sites, such as Twitter and Weibo, allow students and others to interact in a local or global scale to engage and participate in virtual communication to build "global citizenship" (Sobré-Denton, 2015). The librarian not only shares electronic information and provides access to it, but also interacts with patrons through Twitter and Weibo to understand better their information needs. Academic librarians now also have the opportunity to reach students via SNSs and can help them in their own comfortable environments.

The differences between cultural and physical environments in microblogging use might cause variations for effective information exchanges. Understanding the relationship of SNS interactions between librarians and users, and the social or cultural impact of SNS usage might stress new opportunities for self-expression, sociability, and community engagement, as well as encouragement of globally equal access of information (Ellison, 2007; Keenan & Shiri, 2009; Papacharissi, 2010). Research has found that Twitter use, when enthralled by academic discussion, had a positive effect on students' academic performance, engagement and motivation (Junco, Heiberger, & Loken, 2011). Academic librarians create subject guides and study aids for assisting course learning (Jackson & Pellack, 2004); and use microblogging to instruct, facilitate, deliver and guide students from different countries for course learning and professional development (Del Bosque, Leif, & Skarl, 2012). Librarians utilize SNSs to enhance student engagement and reduce their lingual and cultural barriers of learning if any (S. K.-W. Chu & Du, 2013). For example, librarians could guide international students to use technologies such as SNS tools to manage their social networks in a familiar environment and better self-adjust themselves when facing the dramatic environmental and cultural changes.

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This study aimed to understand the interaction types of Weibo and Twitter messages in both Chinese speaking and English-speaking academic libraries. The findings might help librarians use similar microblogging tools to engage users in cultural environments other than English and Chinese.

Literature review

Social networking sites (SNSs), by definition, include almost all cooperative and collaborative environments in Web 2.0 technologies (Alexander, 2006). SNSs are new Internet-based tools that enable users to view, create and share information between their own and others' online profiles(Subrahmanyam, Reich, Waechter, & Espinoza, 2008). Boroughs believed that SNSs enable users to share interests and communities with each other (Boroughs, 2010). Barsky and Purdon stated that SNSs are open access websites that collect and store users' data, including but not limited to, texts, images, music, and videos (Barsky & Purdon, 2006). Microblogging is a new-style social networking site where users can post their status in short sentences and other multimedia content via website, emails, short message, and smart-phone apps (Java, Song, Finin, & Tseng, 2007). With more and more users actively interact with others online, microblogging and other SNSs can be an effective communication tool for real-time information sharing in the online communities.

Currently, Twitter and Weibo are the leading online social networking sites (both ranked among the top 10 list) (Ballve, 2013) and have experienced tremendous growth all over the world (Chen, Zhang, Lin, & Lv, 2011). Twitter is a popular microblogging tool that was launched in 2006 with over 500 million users globally and over 340 million tweets being generated daily (Lunden, 2012). Weibo is the Chinese word for "microblogging." The format of Weibo is similar to Twitter and users are able to upload and share information with a limit of a 140 character block (Chen et al., 2011). Weibo also enables users to access content through multi devices including laptops, tablet PCs, and mobile phones.

There have been several studies on Twitter and Weibo, the two most popular microblogging sites in the world. For example, studies examine how Weibo is compared to Twitter (Gao, Abel, Houben, & Yu, 2012), how tweets being retweeted (Yang et al., 2010) and how Weibo and Twitter being used for essential library service in world cities (Mainka et al., 2013). There is very little literature that reports how Twitter and Weibo are being used in academic library settings, especially for a comparative perspective in different cultural environments. This paper uses Twitter and Weibo as the library SNS sites of study to explore the relationships of the microblogging interactions between users and librarians and to examine the microblogging behaviors in two different cultural environments.

User Interaction Types in Library Microblogging

Academic libraries seem to have a big advantage with the use of SNSs in that a large percentage of the users of these sites are in the age range of the average college student. With its features of brevity of content in real time and fast updates, microblogging provides vivid content useful for user interactions (Ellison, 2007). Users utilize these websites to create their own profiles and pages, which can be publicly or semi-publicly visible to other users (Ellison, 2007). In addition, users can also share their pages with existing friends and search for new friends with common interests (Park, 2010).

SNS interaction type can be defined by how information is exchanged between users (Huang et al., 2015). The interaction types can be n-ways based on the information flow. Four interaction types can be summarized as: one-to-many *information/knowledge sharing* (Harinarayana & Vasantha Raju, 2010), one-to-many *information dissemination* (Ram, Paul Anbu K, & Kataria, 2011), one-to-one *communication*(Lloret Romero, 2011), and many-to-one *information gathering* (O'Dell, 2010). Content being tweeted in libraries was extensively analyzed and classified. Communication types were identified via genre analysis of tweets (Westman & Freund, 2010). In general, people use tweets to interact with others for purpose of information sharing, conversation, and information seeking purposes (Westman & Freund, 2010).

Libraries can produce knowledge and share it with students and others by utilizing their information resources and professionals (MacAdam, 1998). Knowledge sharing via microblogging can be conducted by directing users to references such as online resources and books (Huang et al., 2015). In addition, academic libraries have adopted Twitter to promote library services by tweeting upcoming events or linking multimedia files (Del Bosque et al., 2012). Del Bosque, Leif, and Skarl have surveyed 296 academic libraries in Twitter use, and found seven content types in libraries' Twitter posts: campus events, community events, hours, library events, responses to reference questions, links to outside sites, and resources (Del Bosque et al., 2012). This indicated that academic librarians have used Twitter for promoting university and library events and discussing their resources.

Research has also been conducted on the differences in perceptions and uses of library SNSs, including microblogging among undergraduate, graduate students, and faculty (Park, 2010). It has been reported that university students are interested in SNS posts for entertainment purposes but use SNSs for viewing comments and news less frequently (Hamade, 2013). However, Park and Hamade's work indicated that student users might mostly use SNSs to view their own profiles or other online posts, but not actively posting messages or comments (Hamade, 2013; Park, 2010). Academic librarians therefore can use SNSs to enthrall online users for active engagement such as posting messages, and mediate user activities with SNSs. In addition, SNSs provide an effective method for academic libraries to interact with student users. These interactions however, will only be successful if they provide equal coverage of all subject areas and demonstrate proactive measures to protect student privacy (Dickson & Holley, 2010).

Microblogging in Local Cultural and Online Communications

Microblogging offers people a channel for informal communication with numerous benefits, such as the pursuit of interpersonal activities and personal interests (Zhao & Rosson, 2009). Cross-cultural research has been produced a considerable body of evidence suggesting that culture shapes the acceptance, use and perception of SNSs (Cho,

2010; S.-C. Chu & Choi, 2010; Kim, Sohn, & Choi, 2011). Culture has also been shown as influential in how users use different ways to express themselves in SNSs (DeAndrea, Shaw, & Levine, 2010). The few studies that compare Western and Asian users in SNSs illustrate culture's significant impact on SNS usage and show it to shape attitudes toward SNS interaction between users (Huang et al., 2015; Kim et al., 2011). Thus, SNS practitioners had to accommodate local cultural values, and SNS practice policy is non-universal.

Several studies have reported that communication patterns and user behaviors on SNSs were cultural-dependent. Hall identified the language patterns in different cultures and found that the amount of contextual information is cultural-dependent for information transactions (Hall, 1989). Mandl applied Hofstedes' cultural dimension theory to identify the cultural characteristics of user online blogging behaviors in German and China (e.g., individualistic vs collectivistic, uncertainty avoidance vs uncertainty tolerance) (Mandl, 2009). Communication in high-context cultures (e.g., China) turns to be implicit, indirect, and abstract, whereas users in low-context cultures (e.g., the US) display information more explicitly and directly (Choi, Kim, Sung, & Sohn, 2011).

Recent studies have shown that microblogging users in different cultural environments exhibit diverse online practices. For example, Ma reported cross-cultural content analysis of Twitter and Weibo in a study of electronic word-of-mouth micro-blogs(Lin, 2013). The study showed that American youth from an individualist culture expressed their resistance against general trends in their micro-blogs, but mentioned more about what is unique, special, and different (Lin, 2013). However, Chinese micro-bloggers, from a collectivist culture, showed their interests in what is popular, since they care very much about being accepted by peers, circle of friends, and family (Lin, 2013). These differences may further affect one's perception of, and willingness to participate in online microblogging activities(Siau, Erickson, & Nah, 2010).

The foregoing literature review reveals a number of gaps. First, there is very little literature that report how Twitter and Weibo being used in Academic library settings. Second, it is still unclear why some library social networking sites attract more users than

others. Third, research on microblogging use in library settings rarely consider cross-cultural contexts, meaning it remains unknown how its findings can be adapted across different cultures. Based on the gaps identified in the literature review, this paper uses Twitter and Weibo as the library SNS sites of study to analyze the microblogging posts and to explore the relationships of the microblogging interactions between users and librarians. The study also examines microblogging behaviors in cross-cultural environments and attempts to clarify the cultural impact in microblogging usage.

Methodology

Based on the research gaps identified in the literature review, this study formulated the following research questions:

RQ1: How librarians and users interact in microblogging between Twitter and Sina Weibo? This question was investigated by analyzing the collected microblogging posts by their interaction types, sampled from the academic libraries in English-speaking countries and China.

RQ2: What are the differences in the user interaction types considered to be important for librarians and end-users for Twitter-like technologies in academic library? This question was investigated by comparing the collected posts for interaction types from Twitter and Weibo, sampled from a number of academic libraries in English-speaking countries and China.

The data we investigated was selected based on academic libraries microblogging samples were selected based on the 2012-2013 QS World University Rankings and the 2012-2013 Asian University Rankings. The investigated libraries should have a substantial quantity of posts and should have at least 100 Weibo and Twitter posts or more. There were 23 mainland Chinese universities out of the 800 universities in the 2012-2013 QS World University Rankings (http://www.topuniversities.com/qs-world-university-rankings). Among these 23 universities, the top universities, such as Peking University and Tsinghua University, received much higher funding and resource support than other universities in mainland China (Mohrman, 2008). Therefore, it was necessary

to balance the sample selection in order to reflect the patterns of SNS use in the majority of Chinese academic libraries. Therefore, 20 universities were first selected from the ranking list's bottom to top. However, six of these did not have a library Weibo account, and two of them did not have enough posts to investigate, which left only 12 universities that fulfilled the selection requirements. In order to resolve this issue, eight more substitute universities with similar ranking to those of the eight unselected ones were selected from the 2012-2013 Asian University Rankings. Afterwards, to ensure the comparability of the investigated samples, 20 universities in English-speaking countries that had similar rankings to those of 20 Chinese universities using Weibo were selected based on the 2012-2013 QS World University Rankings (Table 1).

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Table 1: 20 academic libraries selected from universities in Mainland China using Weibo and English speaking countries' universities using Twitter.

Region	Academic library	Web Address	No. of Subscribers	No. of Posts	Avg No. of Forwards	No. of Followers	Forwards-followers ratio
Chinese universities using Weibo	Shanghai Jiaotong University Library (SJUL)	http://e.weibo.com/sjtulib	2859	510	5.15	2859	0.18%
	Nanjing University Library (NJUL)	http://e.weibo.com/njulibrary	7758	882	5.5	7758	0.07%
	Zhejiang University Library (ZJUL)	http://weibo.com/u/2671231082	870	270	2.13	870	0.25%
	University of Science and Technology of China Library (USTUL)	http://e.weibo.com/ustclib	594	212	1.75	594	0.30%
	Beijing Normal University Library (BNUL)	http://www.weibo.com/bnulibrary	4856	2119	11.81	4856	0.24%
	Beijing Institute of Technology Library (BITUL)	http://e.weibo.com/u/2710400355	866	153	1.08	866	0.13%
	Nankai University Library (NKUL)	http://e.weibo.com/nklib	1723	332	3.58	1723	0.21%
	Sun Yat-sen University North Campus Library (SYUL)	http://e.weibo.com/medicallibrary	684	216	3.65	684	0.53%
	Tongji University Library (TJUL)	http://e.weibo.com/tongjiunivlibrary	6148	1149	5.03	6148	0.08%
	Wuhan University Library (WHUL)	http://e.weibo.com/whulibrary	10125	1315	14.5	10125	0.14%
	Xiamen University Library (XMUL)	http://e.weibo.com/xmulibrary	11007	726	13.4	11007	0.12%
	Southeast University Library (SEUL)	http://e.weibo.com/seulib	5028	955	2.43	5028	0.05%
	Beihang University Library (BUAAL)	http://e.weibo.com/buaalib	5171	864	6.56	5171	0.13%
	East China Normal University Library (ECNUL)	http://e.weibo.com/ecnulib	6676	799	9.36	6676	0.14%
	Dalian University of Technology Library (DUTL)	http://weibo.com/libdlut	1650	470	2.25	1650	0.14%
	Beijing University of Technology Library (BUTL)	http://e.weibo.com/bjutlib	3892	221	4.1	3892	0.11%
	Sichuan University Library (SCUL)	http://weibo.com/u/1930235983	3567	2492	7.78	3567	0.22%
	Nanjing Agricultural University Library (NJAUL)	http://weibo.com/u/1997102065	2517	630	2.38	2517	0.10%
	Hunan University Library (HNUL)	http://weibo.com/u/2758549423	1235	341	6.43	1235	0.52%

	Shanghai Normal University Library (SNUL)	http://e.weibo.com/shnulib	4978	983	3.9	4978	0.08%
English-speaking Universities using Twitter	University of Liverpool Library (LVUL)	https://twitter.com/LivUniLibrary	1501	1599	0.68	1501	0.05%
	University of Florida Library (UFL)	https://twitter.com/uflib	1300	441	0.21	1300	0.02%
	University of Leicester Library (ULCL)	https://twitter.com/UoLDWL	767	626	1.08	767	0.14%
	RMIT University Library (RMITUL)	https://twitter.com/library_rmit	898	748	0.5	898	0.06%
	University of Tasmania Library (UTL)	https://twitter.com/UTAS_library	110	101	0.45	110	0.41%
	Bangor University Library (BUL)	https://twitter.com/BangorUniLib	515	323	0.2	515	0.04%
	Northeastern University Library (NUL)	https://twitter.com/ClubSnell	1758	907	0.8	1758	0.05%
	Rutgers - The State University of New Jersey, Newark Library (RUL)	https://twitter.com/RULibraries	526	321	1.38	526	0.26%
	Swinburne University of Technology Library (SUTL)	https://twitter.com/swinlib	641	2198	0.95	641	0.15%
	Syracuse University Library (SUL)	https://twitter.com/SyracuseULib	674	915	0.45	674	0.07%
	University of Oklahoma Library (UOKL)	https://twitter.com/OULibrarian	456	611	0.28	456	0.06%
	University of Vermont Library (UVL)	https://twitter.com/UVM_Libraries	1153	539	0.55	1153	0.05%
	Louisiana State University Library (LSUL)	https://twitter.com/lsulibraries	868	918	1.1	868	0.13%
	Temple University Library (TUL)	https://twitter.com/TempleLibraries	1167	1644	0.43	1167	0.04%
	University of Bradford Library (UBFL)	https://twitter.com/LibraryUoB	167	355	0.79	167	0.48%
	Georgia State University Library (GSUL)	https://twitter.com/gsu_library	1004	1208	0.35	1004	0.04%
	Marquette University Library (MUL)	https://twitter.com/MarquetteRaynor	194	316	0.53	194	0.27%
	University of Arkansas Library (UAL)	https://twitter.com/UARKLibraries	740	899	0.33	740	0.04%
	University of Denver Library (UDL)	https://twitter.com/DUCommons	945	1206	0.3	945	0.03%
	University of Western Sydney Library (UWSL)	https://twitter.com/UWSLibrary	177	405	0.08	277	0.03%

Note: All the data in the table were collected on 15th March 2013; the number of posts and subscribers might increase or decrease afterwards. 1) Average number of "forwards": total "forwards" number / 40 (40 posts were collected from each library); 2). "Forwards"-Follower Ratio: average forwards number / library's Weibo follower number; 3). For ZHUL, there was a post that generated 900 forwards, while other posts generated fewer than 10, so that post was ignored as an outliner to ensure the reliability of the data; 4). Six higher-ranking libraries and six lower-ranking libraries were highlighted for further analysis.

Data collection and analysis

A content analysis was performed on the number of "forward" and "retweet" actions for both Weibo posts and Tweets, generated during the university's Fall semester of September 2012 through January 2013. All the posts were stratified by date. The posts were selected by the following dates of month according to systematic random sampling: 3, 6, 10, 13, 17, 20, 24, and 27. Specifically, when a preferred date had no post, then the post from one day or two days before or after was selected. By doing so, 1600 posts in total (800 from Chinese library Weibo sites, and another 800 from English library Twitter sites) were harvested for further analysis. The coding scheme (Table 2) with different categories of posts was used to classify the posts(Glaser & Strauss, 1967). A series of codes were used to mark the harvested Weibo and Twitter posts that were extracted from the texts. The codes were grouped into similar "themes" or "taxonomies." These "themes" were then merged and realigned with the four interaction types identified in Table 2 and related literature (Huang et al., 2015). The interaction types were not exclusive to one another, which meant that one post could contain more than one type of interaction. Two researchers coded the sampled posts independently. Before and during the coding, coders discussed the definitions and meanings of the terms in Table 2 in order to reconcile any differences in understanding. For good qualitative reliability, Miles and Huberman recommended that the consistency of the coding be in agreement at least 80% of the time (Miles & Huberman, 1994).[i] To establish inter-rater reliability, two researchers independently coded 50 randomly selected posts based on the scheme, which resulted in 90% inter-rater agreement. The categories and subcategories that emerged from the data are summarized and illustrated in Table 2.

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Table 2. Microblogging post categories, interaction types, subcategories, and sample posts.

Category	Definition	Interaction	Sub Category	Sample Posts
Information dissemination	The posts that contain announcement and news from libraries.	One-to-many	Events	The exhibition of Original Edition Academic Book has been held at Second Lobby of New Library, and will continue until Friday, welcome teachers and students to visit!
			Facilities	Main Library 3/F Self Study Room will be closed for one week - 4 Sep to 12 Sep, please take all your belongings away before close, librarians won't help keeping the belongings. Thank you for your cooperation and please help to tell other users too.
			Services	Need some help getting started with essays? Find the 808 range at your Library site for books on academic writing. http://xxxx
			Library Hour	The Library is now open 24/7 for the duration of the January exams. More at http://xxxx
			Lectures	The Week's Lecture - Introduction of Science Citation Index & Engineering Index. Your attendance is most welcome!
			Position Opportunities	Position vacancy: Library Assistant 2 - Imaging Assistant in the Digital Library Ctr. http://xxxx
			Others	A snowy view from Sydney Jones this afternoon pic. http://xxxx
Information/ Knowledge sharing	The posts in which librarians that share things with others, like online resources, public resources, lectures, books, news, etc.	One to many	Online resources	#New Resources Recommendation # Taiwan academic online -TAO include many Taiwan Academic Periodicals, contains index, abstract and full text, 945 kinds of serials and in total more than 2.8 million pieces. Address: http://xxxx
			Collections	Our library's ancient and rare books collections are online!~
			Librarian personal knowledge sharing	Sharing skills and experiences with faculty and students for journal selections and paper submissions.
Communication	The posts in which librarians reply the users' questions, comments, or complaints, etc. The posts are usually initiated by users but sometimes the librarians make no reply. Libraries may also re-post what other users have wrote on their page. Some libraries also hold	One to one	Reply Users' Questions	REMINDER! Due to maintenance ProQuest databases will be unavailable from 10pm Sat 29th to 10am Sun 30th Sept
			Comments	Which library? Have you reported it(the issue)?
			Complaints	Air con problems at XXXX Library today so it's closed for the rest of the day. Sorry 'bout that, it's cool at the other sites though.
			Retweeting	I love this video! More #libraries should do this sort of promo! http://youtu.be/xxxx "What's a library database?" | RMIT...
			Others	Hello to students on CHEM180. Good luck with your library exercise!

	some contests to engage users.		Discussion- Initiated by librarian	Not looking good out there (pharos is going in and out), but they're working on it, we'll post updates here
			Discussion- Initiated by end-user	Sharing is caring! Don't forget to let us know if you win so we can derive publicity from it ;)
Information gathering	The posts in which the users are directed to fill in a questionnaire or cast a vote for the issues raised by the librarians.	Many to one	Questionnaire	Want your voice to be heard? How about entering now to win a new iPad? Swing through the lobby of Snell, take a survey, you can do both!!
			Voting(Poll)	Join the Academic Sports Challenge and Support the Libraries: The George A. Smathers Libraries, along with the s... http://xxxx
			Contest	#Photo Contest - Discovered the beauty of library # We will hold a photo contest to celebrate the Fourth anniversary of the birthday! Date: 08-20 Dec,2012; Method: Email to xxxx or forward our Weibo Account.
			Recruitment	Any volunteers for library history exhibits next week?

Note: The four interaction types were based on Huang et al., 2014. The coding scheme was based on four interaction types mentioned in the literature review, then combined and divided into several more specific categories.

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Findings

Interactions between librarians and library users

The Weibo and Twitters posts were coded and analyzed based on the interaction types shown in Table 2. Initially, the study found posts related to library news, in which librarians disseminated what had been happening in the libraries. "Library news" includes announcements of availability or updates on library events, facilities, services, collections, opening hours, and so forth provided by the library. These posts can be regarded as one-to-many information dissemination, and all the information is directly related to the library itself. Secondly, the study found posts related to information/knowledge sharing. This kind of post involves one-to-many information and knowledge sharing. For example, this occurs when a librarian finds some public resources, public lectures or interesting current affairs on the internet and then shares the information with library users via SNSs posts. Third, the study found some posts related to online communications that involved one-to-one conversations between librarians and library users. Such conversations can occur through many channels, such as comments, forwards, or private messages. At the same time, the conversations may have a variety of content, such as replying to inquiries, resolving complaints, and so on. Finally, some posts were found to be related to surveys and collecting opinions. These kinds of posts can be regarded as many-to-one information gathering, such as surveys or voting activities organized by librarians. Such interactions are aimed at harvesting information from individual users to gain insights into how people feel about library service etcs.

Comparison of Weibo and Twitter posts in interaction types

The harvested posts from Weibo and Twitter were aggregated and counted according to four interaction types: information/knowledge sharing, information dissemination, communication and information gathering (Figure 1). Posts on Weibo and Twitter

demonstrated different distributions in interaction types. As shown in Figure 1, Chi-Square analysis indicated that there were significant differences between Weibo and Twitter regarding the number of posts for information dissemination (X^2=23.8, p<0.0001), communication (X^2=112.8, p< 0.0001), and information/knowledge sharing (X^2=44.7, p<0.0001). Figure 1 shows that Weibo had the highest number of communication posts (n=391). The second biggest category in Weibo, information dissemination, comprised a great number of posts (n=310), about 39% of the total harvested posts. However the percentages of the last two types (sharing and survey) were smaller, accounting for only 11% and 1% respectively. This result indicates that Chinese academic libraries are more likely to use Weibo to communicate with users and to disseminate library news.

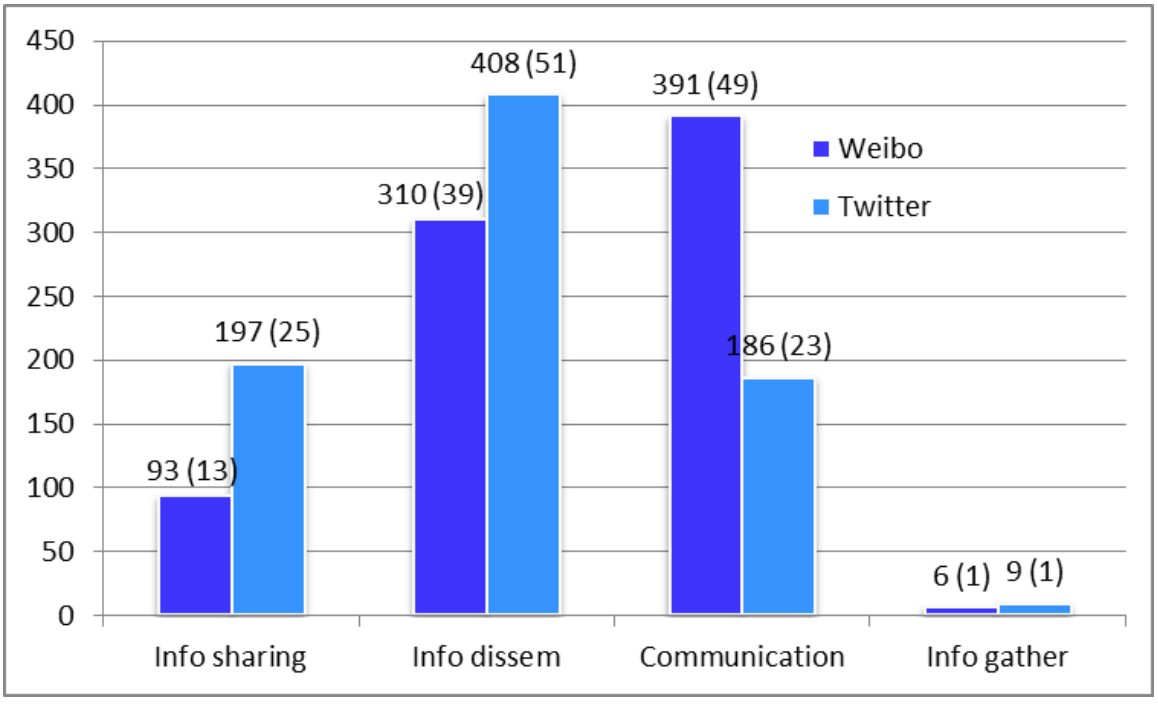

Figure 1: Distribution of the four interaction types of posts on Weibo and Twitter. Values within parentheses are the percentages.

In the case of the Twitter posts, Figure 1 shows the Twitter coding results, with more than half of the investigated posts constituting library news (51%), and with communications and information sharing accounting for 23% and 25% respectively. Information gathering accounted for the lowest percentage on both Weibo and Twitter. Therefore, for Twitter, the most common interaction was library news postings. Of the four main dimensions of interactions in the literature review, communication and information dissemination can be considered as the most common form of interaction that librarians adopted to interact with their users.

Discussion

Traditionally, academic libraries have served as the institution where students and faculty alike could go to fulfill their research needs. These tasks can be done with the support of end-users from academic librarians' reference service and other activities in helping their research. It has been found in this study that academic librarians can also use SNSs to conduct one-to-many information/knowledge sharing or one-to-one communication for in-depth interaction for research support. With regard to libraries that are undecided about whether or not to implement SNSs to promote continued institutional and professional values, they need only look to the positive gains other libraries have had as a result of incorporating SNS tools into their repertoire of outreach, whereby increases in student/librarian interactions are the result.

Twitter and Weibo Posts with Interaction Types

Microblogging provides many attractive application attributes, one of which is its ability to promote and increase information dissemination. Although the study demonstrated micro-blog's effectiveness in the libraries advertising of current events (Cuddy, Graham, & Morton-Owens, 2010), it possesses great potential as an on-line survey tool through which the library is able to gain valuable feedback and insight into growth opportunities. Such an interactive environment facilitates a means through which library can enable

library users to view themselves as valued contributors in the implementation of positive change to the areas that they believe would be of greatest benefit to them, such as increased librarian assistance and digital services, or operating hours.

Chinese libraries sustained positive interactions through reciprocal communication and information/knowledge sharing through Weibo, whereas English-speaking libraries overwhelmingly promoted Twitter interactions based on posts containing information that was relevant to the library's current news and events. Chinese library Weibo usage was found to produce a higher rate of reciprocal interactions (one-to-one communication as interaction) than that of English-speaking library Twitter users, whose interactions resulted in a lower rate of reciprocal interactions and a higher rate of simply "sharing" URLs or other external links. These differences could be the result of the Chinese language itself, which is a high-context language and can be expressed effectively with the 140 character limitations (Gao et al., 2012).

Of all the posts, the ones relating to personal interaction usually generated more retweets and positive Twitter user feedback. Furthermore, academic librarians in China like to use Weibo to post information related to "contests," as a way for information gathering, to engage users and promote their library services. For example, libraries may hold a series of photographic, leisure, or technology "contests". The "contests" offer some incentives, and participants could win a prize by participating. This can have an increase in the number of responses to posts that provided information on contests, recruitment, and other information gathering. Similarly, in the English-speaking libraries' use of Twitter, librarians had come up with a number of ideas to attract users' attention, including daily notification of new resources, friendly reminders about library services, and personal interaction between users on topics such as their emotions, sports, and other public activities.

Information/knowledge sharing with SNS for library users

The survey results indicated that college students in China expressed their strong need for information/knowledge sharing from academic librarians. Students chose information/knowledge sharing as the most engaging posts indicated that they wanted to see more posts about online resources or to find other knowledge sharing posts from librarians. Library professionals can take advantage of using microblogging to direct library resources to students in a timely manner. Furthermore, user engagement in microblogging can be improved through knowledge sharing with librarians. Indeed, the quantitative statistics of 800 sampled Weibo posts were based on the number of the posts forwarded, and since the users felt interested with the posts on information/knowledge sharing, they would be more likely to forward those kinds of posts. Therefore, user engagement in information/knowledge sharing could be very high.

However, there appeared to be a perception difference in what librarians regarded as engagement. It appeared that user interaction of any kind indicated to the librarian that their posts were attracting, and thereby increasing, user interaction. What librarians need to do however, is to assess user responses to determine if the type of information they are disseminating is, indeed, the type of information the users are interested in.

The current research found that librarians ranked communication posts the highest in attracting more users; however, Chinese library users' answers inclined toward information/knowledge sharing as having the highest ranking. One reasonable explanation lies in the different judgments in terms of "attractive or engaging." In Chinese library SNSs, there are more posts about information/knowledge sharing content in contrast to English-speaking libraries, where more posts about news and events can be found. The Chinese language, as mentioned, is very high-context and can be expressed well with limited words (Gao et al., 2012). Since librarians in the English-speaking countries had to do multiple tasks, they have limited time for managing Twitter posts. However, the Chinese libraries had better manpower, and Chinese librarians had more time to make Weibo posts. After a librarian had posted an initial tweet, the librarian would receive more questions, comments, and complaints from users. This might require more reciprocal communication from users and librarians.

Library users understand the librarian's role and rely on their expertise to guide them to the resources they need. While SNSs can be used as a secondary means to promote a fun and entertaining user experience, library users also expect libraries that use a SNS to communicate with its users to provide quality information that will meet their research needs. Therefore librarians can use SNSs as an effective reciprocal communication channel to facilitate and create more posts that can promote information and knowledge sharing in order to direct users toward online resources or other resources from the libraries.

Social networking will continue to grow both in popularity and use in connecting people through on-line communications. The findings demonstrate that there is a need for librarians to direct their use of SNSs toward providing users with information and knowledge sources as the technology evolves and more people connect online. Libraries should first identify clear goals and purposes for adopting SNSs, such as that of enhancing outreach services, so that their use will more positively influence and meet user needs. Social networking tools could be incorporated into the current library model to enhance its outreach and services for some users (Kho, 2011).

This study has some limitations, however, the basis for perceptual differences found to exist between librarians and end-users with regard to SNS interactions need further exploration. Survey and interviews for both Weibo and/or Twitter library users and librarians can be conducted for further understanding user perceptions of SNS interactions. How technical and cultural factors affect the promotion of library services through SNS usage must also be further evaluated. Additionally, subsequent follow-up interviews with both Chinese and English librarians and users should provide valuable insights into the development of more effective strategies to increase end-user/librarian interactions in the future. In addition, there is little understanding of what librarians or end-users expect of SNS interactions and how they interact with each other via library related posts in the SNS environment.

Conclusion

Social networking tools provide a virtual means through which libraries and their users connect, share, and exchange information and ideas (Maness, 2006). Social networking serves as a primary vehicle today that enables libraries to promote, through greater visibility, the value of the services they offer (Casey & Savastinuk, 2006). The collaborative partnership created through the utilization of social media platforms has increased the efficiency with which libraries are able to aid users and respond to their inquiries, engage in information and ideas sharing, and promote and encourage participation in library events (Sodt & Summey, 2009). While more libraries are adopting new services and improving user services, social networking sites have equally facilitated the way in which users can communicate with libraries for a number of reasons. Social networking and Web 2.0 technologies have assigned 21st-century libraries the critical task of transforming themselves into hybrid institutions with both a physical and a virtual existence to better meet user needs better (Rubin, 1998).

Many libraries have already adopted social networking, and more libraries are currently weighing the options (Kho, 2011). Social networking sites (e.g. Facebook, Twitter, Pinterest, and Instagram) offer a viable means by which to influence traditional library services, outreach, and marketing positively while reaching the larger population of users already entrenched in communicating via these applications (Cooke, 2008). Social networking exemplifies effective technology use, and, if integrated properly, offers great user-centered potential for library/user interaction.

In addition to the promotional value of information/knowledge sharing, this study found that the use of SNSs provided entertainment value to user/librarian communication exchanges. The study also showed the value of increasing user engagement by librarians adapting SNS use to respond to and meet user needs that incidentally include facilitation of reciprocal knowledge exchange. At present, SNS tools are mostly limited to disseminating announcements of events and information about online resources. However, librarians could design and engage in other activities based on users' expectations, and offer more activities related to knowledge sharing and online instructions.

The findings of this study could provide librarians with SNSs guidelines for promoting information/knowledge sharing with international students and people from different cultural backgrounds. Consequently, librarians could utilize either indirect or direct communication strategies to accommodate user engagement. Successful implementation of a social networking tool, however, will need additional planning and improved policies to ensure that privacy, security, and adherence to ethical considerations are met. In addition, extra efforts in technical support must be provided to aid the speedy resolution of technical difficulties, and improve SNS services.

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