

The Effectiveness of Online Emergency Management in Colleges and Universities: An Empirical Analysis from Mainland China

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Abstract

During the period of COVID-19's emergency response, thematic websites on epidemic prevention and control in colleges and universities in mainland China were set up intensively. Nevertheless, there has been limited research in the world scale about colleges and universities' online emergency management effectiveness, which may not be conducive to testing it or to practical change for higher education institutions in the New Media Era. An analysis framework was therefore constructed in this study, with content analysis method used to code and analyze a full sample of 74 thematic websites of colleges and universities in mainland China regarding five aspects. Meanwhile, an exploratory case study method was adopted to explore one special aspect. Results showed that the degree of institutional collaboration displayed in the websites was high; the information content was limited, but the usability was good; attention to the needs of general group was paid, while the needs of special groups was limited; the characteristics of democratic interaction were obvious, but lacking in interaction under the support of information technology; the local cultural governance model was prominent, but not common. Some suggestions were accordingly given.

Keywords: COVID-19; higher education; epidemic prevention and control; online emergency management

COVID-19 has been a resounding word throughout the globe since last year, bringing a great challenge to the management of government, society and all kinds of organizations (Haghani, Bliemer, Goerlandt, & Li, 2020), especially for the management of colleges and universities all over the world. Since colleges and universities have the characteristics of personnel concentration, students' mobility and intensive activities in holidays, it is easy to become the "main position" of public health emergencies. During the outbreak of

COVID-19, most staff of colleges and universities have left the campus, which has greatly reduced the pressure on campus management, but this does not mean that pressure on epidemic management has been weakened. In fact, it is the transfer of their management focus to the line, such as students' remote management and education, online psychological counseling, social services and scientific research. In view of this situation, a number of "epidemic prevention and control" thematic websites have emerged for the first time in a very short period of time in colleges and universities in China, where might be the original outbreak "center" of the world. It has become the main means of epidemic prevention and control in Chinese colleges and universities, and opened up a new path for online emergency management in higher education institutions. However, literature both in China and in the world scale (eg. You, Wu, & Chen, 2009; Omidvar, Karimloo, Tavakoli Sani, & Darabi, 2017) focuses much on the campus entity management of higher education institutions' emergency management, which is rarely related to online emergency management, so that the corresponding analysis framework or empirical

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research is absent. To some extent, this will hinder to test colleges and universities' effectiveness of online emergency management and its upgrading and improvement especially in the New Media Era. Therefore, on the basis of existing research, this study attempts to construct a framework for analyzing the online emergency management of colleges and universities; and then makes a content analysis of the thematic websites set up by all the 74 colleges and universities; and as well carries out a case study to mine and interpret two of them, in order to diagnose problems existing in these websites and put forward optimization suggestions.

1 Analysis framework

Online emergency management is a concrete manifestation of the informationization of higher education institutions governance, which is conducive to the supervision of epidemic situation in colleges and universities and prevent the occurrence of second panic crisis (María et al., 2019). Particularly in view of the great impact of COVID-19 recently, thematic websites will possibly become a regular tool for emergency management in colleges and universities, and its construction should be democratic, open, transparent, timely and detailed. It is no doubt that democratic participation is one of the important factors to measure the effectiveness of online emergency management in colleges and universities. The rapid response and timely control of epidemic must be based on the trust and cooperation of relevant groups (Fang, & Wang, 2011; Runhaar et al., 2012). The realization of democratic participation must be based on the openness, transparency, timeliness and detail of information, which determines the willingness, mode and degree of relevant groups to participate in emergency management of an epidemic (Cao, & Ji, 2013; Ha, 2019). At the same time, institutional collaboration is also another important factor. In essence, emergency management in higher education institutions is still a sub-system of social management system. Only through the cooperating with other institutions or organizations can higher education institutions' management efficiency be better brought into play, and only through the establishment of institutional collaboration mechanism can they achieve inter-agency division of labor and collaboration, cooperate with one another, thus stimulating potential and complementing their advantages mutually (Gilissen, Alexander, Matczak, Pettersson, & Bruzzone, 2016).

Brooke Fisher Liu (2008) constructed an analysis framework of online emergency management, and

analyzed the government websites of 50 states in the U.S. in terms of democratic engagement, information content, the needs of special groups and institutional collaboration and the relationship among them. However, information content in this framework did not take content usability into account, and it is a key element to evaluate the implementation effect of e-governance, supposing when users are unable to find or to obtain key information they need, such information content is meaningless, thereby affecting users' trust formation (Bertot, Jaeger, 2006). Susan A.Youngblood, et al (2017) constructed a standard of content usability of emergency management websites, which mainly involved five dimensions of website design: general usability, hyperlink of reference resources in text, navigation criterion, readability and searchability, which improved the analysis framework to some extent. By further combing the relevant theories of emergency management, it is found that cultural governance, as an indispensable factor, directly determines the success of an emergency management system construction and implementation (Kyo-Man Ha, 2019). Some scholars (eg. Gong, 2019; Bossong & Hegemann, 2013; Kuipers et al. 2015) have clearly pointed out that the construction of emergency management system in higher education institutions must be rooted in the national conditions, cultural context and historical experience of different countries, and understand the structural differences and potential similarities between national or regional security systems. Therefore, this study integrates the factor of cultural governance and reconstructs a framework composed of institutional collaboration, information content, democratic interaction, group needs and cultural governance and their relationship (seeing Fig.1).

As can be seen from Fig.1, there are five factors consisting in online emergency management in higher education institutions. First of all, colleges and universities realize normal operation of their e-governance through cooperation with relevant institutions or organizations. Secondly, the fundamental vision of online emergency management in colleges and universities is to provide accurate and effective services for relevant groups, which is achieved by exchanging relevant information and content via information technology. Thirdly, e-governance of colleges and universities can not only enable them to provide more high-quality and immediate information for students and teachers, faculty and staff, and the public, but also promote more frequent and

democratic interaction among different stakeholders. Fourthly, e-governance in colleges and universities has greatly improved its ability of accountability and response, made the implementation process more transparent, further met the needs of relevant groups, and stimulated the enthusiasm of democratic interaction between related institutions, organizations and groups. Fifthly, there is no universal emergency management system found in higher education institutions, and the construction of online

emergency management system must be based on understanding the structural differences and potential similarities between national or regional cultural contexts. The implementation of cultural governance in online emergency management in colleges and universities should mainly reflect the characteristics of local roots, elastic governance, flexibility and precision and characteristics forming, thus imperceptibly affect the role of the former four factors.

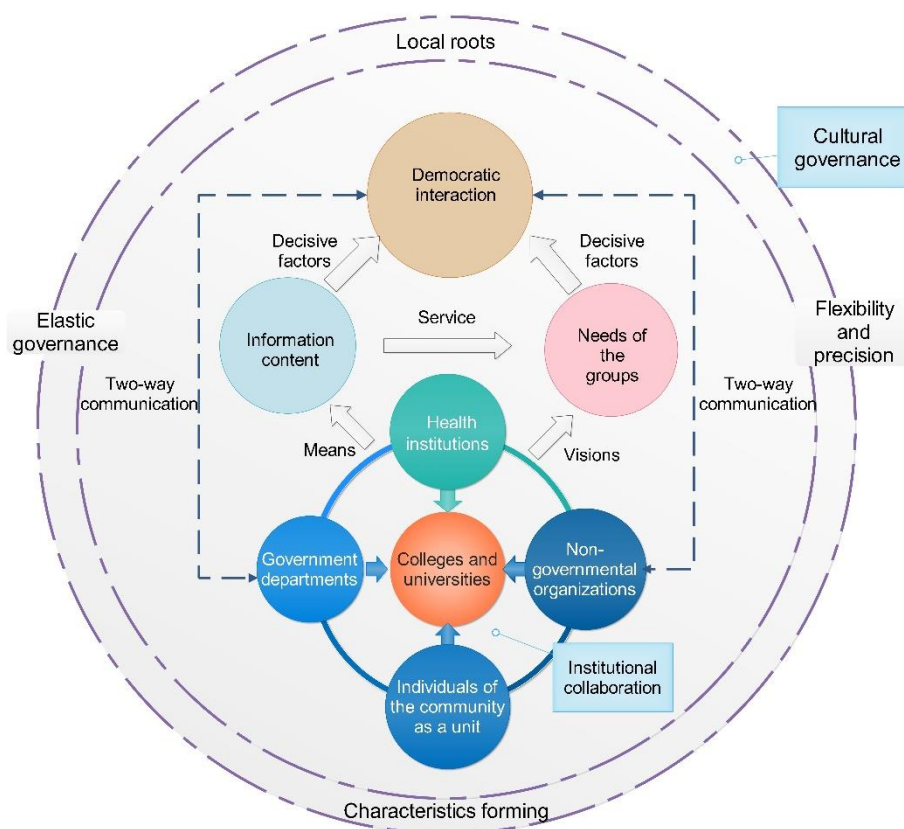


Figure.1. Analysis framework of online emergency management in colleges and universities

2 Research design and methods

According to the analysis of framework reconstructed above, this study will focus on five specific questions, and propose corresponding hypotheses as follows:

Question 1: how do these thematic websites reflect collaboration between institutions or organizations? To what extent?

Hypothesis 1: the degree of collaboration among university-centered agencies is not high.

Question 2: what are the main types of information content in the thematic websites and what is their usability?

Hypothesis 2: the types of information content are limited and the usability is poor.

Question 3: can these thematic websites meet the needs of different groups?

Hypothesis 3: these thematic websites cannot meet the needs of special groups well.

Question 4: how many opportunities do the thematic websites provide for democratic interaction between relevant stakeholders and higher education institutions?

Hypothesis 4: there is little democratic interaction in the thematic websites, and the ways are monotonous.

Question 5: do these thematic websites implement cultural governance to reflect their own characteristics? To what extent?

Hypothesis 5: there are few characteristics of cultural governance in the thematic websites.

This study will adopt the method of mixed research, which is a combination of quantitative and qualitative content analysis. First of all, a full sample analysis is made, with crawler technology used to crawl the text content of all the 74 colleges and universities' thematic websites. Then institutional collaboration, information content, democratic interaction and group needs of these websites are encoded and analyzed within the analysis framework. The two coders double-encode the content, and the reliability score is 93.95 calculated by using Holsti's formula. The coding time is from February 15th 2020 to February 10th, 2021. According to Brooke Fisher Liu's (2008) coding percentage evaluation criteria, the proportion of a coding category in the websites can be divided into 6 levels, namely, very common (90-100%), common (80-90%), general (70-80%), less (50-70%), rare (20-50%) and very rare (0-20%). The usability of information content follows the standard of content usability of emergency management websites constructed by Susan

A.Youngblood et al.(2017), using a dichotomy (yes and no), coding from five dimensions: general usability, hyperlink of reference resources in text, navigation criterion, readability and searchability; and as well the home page of each website is encoded to see if it follows each Achecker standard. Details are shown in Table 3. In addition, specifically for the analysis of cultural governance, because of the potential and not easy to quantify in the way of its influence, this study will employ the case study method as a supplement. Firstly, through purposeful sampling, two case websites are selected, which are obviously in line with the characteristics of cultural governance. The selection criteria mainly include whether it is in accordance with the actual epidemic situation of this time, which embodies the characteristics of the college or university, providing services to relevant groups (website users) flexibly and accurately, or forming its own characteristics. Secondly, main practices of the two websites are explored and briefly discussed from four aspects: rooted in local area, elastic governance, being flexible and precise, forming characteristics. In the conclusion part, five aspects corresponding to the five factors will be summarized and relevant suggestions will be thus given. The overall technical road-map is shown in Fig.2.

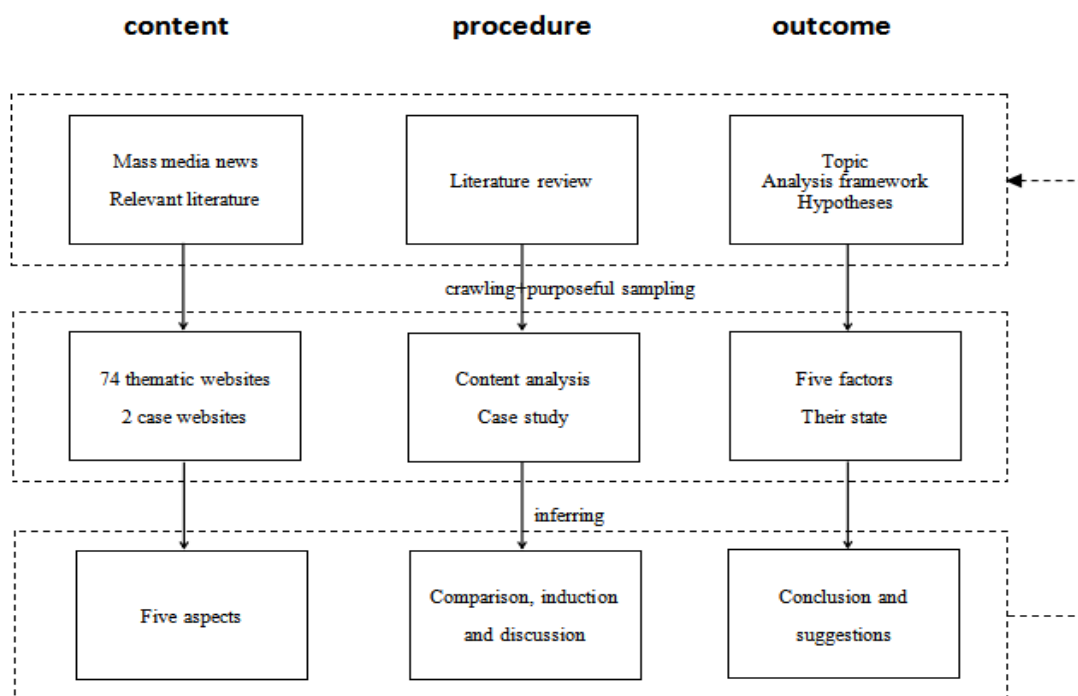


Figure 2. Overall technical road-map of the study

3 Results and analysis

3.1 Institutional collaboration

The data of institutional collaboration are

mainly used to measure the active degree of administrative departments or other institutions and organizations at all levels in the websites.

Table 1. Active degree of institutions or organizations and their evaluation levels

Institution or organization	Active degree	Evaluation level
Ministry of Education	100%	Very common
Central government	97%	Very common
Provincial education departments	94%	Very common
Health institutions	78%	General
Non-governmental organizations	64%	Less
Other colleges or universities	61%	Less
Emergency management departments	45%	Rare
Individuals of community as a unit	1%	Very rare

Table 1 lists the active degree and evaluation level of relevant departments, institutions or organizations. Obviously, all the thematic websites are related to Ministry of Education, which is the highest-level of Chinese government department in charge of education. Most of them are related to the gist, decision-making and latest developments of Chinese central government (97%) and local education department (94%), both of which together with relevant information of Ministry of Education constitute the guiding content for colleges and universities to implement epidemic prevention and control. It may well be necessary and reasonable for the information of health institutions to appear on the websites. Health institutions provide medical services for colleges and universities in the emergency response link, where medical conditions are mostly poor; and coupled with the shortage of medical personnel and materials in the hardest-hit areas of this epidemic, colleges and universities there are facing an extremely serious medical crisis. So, the close cooperation between the two is an important way to deal with major epidemic situations. 78% of colleges and universities have established contacts with health institutions so far, generally focusing on information sharing or donation.

It is seen from the table above that more than half of the colleges and universities have established contacts with non-governmental organizations (64%), and some have already begun to realize the important role of them in emergency management. Actually, non-governmental organizations play a special role in the process of emergency management in higher education institutions. In the process of providing public goods services, not only can non-governmental organizations optimize the integration and allocation of resources, participate in emergency management decision-making in colleges and universities, urge consultation and dialogue among relevant subjects, but they can also promote the sustainable development of emergency

management in colleges and universities. From the perspective of organizational structure, the participation of non-governmental organizations in online emergency management in colleges and universities is a specific representation of the construction of a multi-subject pattern, which will be more conducive to timely, correct and accurate prevention and control in the process of dealing with major epidemics in colleges and universities.

Meanwhile, some colleges and universities have also established contacts with other higher education institutions (61%). On one hand, they are already closely linked in the process of daily teaching and management, and will be more concerted during the outbreak of this epidemic; on the other hand, close ties between them promote the sharing, collaboration and exchange of emergency management experiences, which lays foundation for the routine and continuity of emergency management. Moreover, the proportion of emergency management departments in the websites is relatively low (45%). Compared with other government departments, colleges and universities have less contact with emergency management departments.

To sum up, online emergency management of the samples has initially formed cooperation among institutions or organizations. First, the layout of institutional collaboration is kind of balanced, and the relationship between colleges and universities and relevant agencies concern about superior departments in the administrative system of government, while the contact with health institutions and non-governmental organizations is relatively less. Second, the multi-subject structure of non-governmental organizations participating in online emergency management of colleges and universities has initially taken shape. Currently, relationship between higher education institutions and non-governmental organizations is mainly focused on donation and resource integration. Some colleges and universities realized the importance of non-governmental organizations'

participation.

3.2 Types of information content and their usability

Information content of all the thematic websites mainly contains policies and regulations, work

progress, epidemic bulletin and knowledge of prevention and control. Among them, work progress shows the main practices, process and implementation measures of emergency management in colleges and universities, while the other two types are mainly from government departments and news media as detailed in Table 2.

Table 2. Proportion of different types of information content and their evaluation levels

Type	Proportion	Evaluation level
Policies and regulations	100%	Very common
Work progress	100%	Very common
Epidemic bulletin	100%	Very common
Knowledge of prevention & control	100%	Very common
Rumor Refuting	26%	Rare
Psychological counseling	20%	Rare
Donation	5%	Very rare
Health information reporting	4%	Very rare
Special column	4%	Very rare

First of all, 26% of colleges and universities have provided special information to refute rumors, which to a certain extent shows that colleges and universities have low awareness of online emergency management. From perspective of the dynamics of infectious diseases, the spread of rumors and is highly similar with the spread of virus, involving those who are susceptible (not having received relevant rumor information), those who are infected (knowing the rumor information and spreading it immediately), and those who are immune (knowing the rumor event but not spreading it) (Fuji & Jinhua, 2018). Virus harms one's physiological state, while rumors harm one's mental state. Coupled with the fact that people are prone to believe in the face of rumors, it will cause rumors to spread rapidly with their anxiety and panic, further misleading to their wrong behaviors of prevention and control and hence expanding the spread of virus.

Psychological counseling is also ignored by most colleges and universities, accounting for 20%. Although knowledge of prevention and treatment contains the information of mental health, it is only one-way, and actually cannot grasp the real mental state and the psychological change of students, let alone know how to solve and interfere with their psychological problems. Therefore, psychological counseling should be very necessary. Some studies have confirmed that the psychological harm of public emergencies to people is no less than physical injury, but psychological recovery takes longer and more investment (Omidvar et al, 2017).

Table 2 also shows that most of the thematic websites involve information on donation or

acceptance of donations, but only 5% have made it to the public. The openness and transparency of information content is a key factor affecting public's trust in institutions. Although users' trust in e-governance is based on its trust in the entities (Michael Parent, et al, 2005), fundamentally speaking, e-governance is an organic part of institutional management, and the two cannot be completely separated. Therefore, colleges and universities should construct the information disclosure system by eliminating Isolated Island Effect of the information, to closely link the sense of users' trust with the transparency of information.

It is worth noting that only 4% have set up health information reporting and special columns, most of them still use the method of manually collecting health information, and even few ones use online systems to collect, count and analyze health information. Online system collects information and data has incomparable advantages over manual collection in convenience, intelligent analysis, visualization and sustainable tracking, but the current application in colleges and universities is very scarce. As far as the special column is concerned, only three have set up special columns, and their main method is to establish the electronic special issues of epidemic prevention and control, creation of cultural works based on a school or a department, volunteer event "being on-the-spot" and so on as the main content.

In order to further explore the usability of information content, it is also manually tested whether the design of all the thematic websites are in line with the standards of content usability of emergency management websites.

Table 3. Description of different information content and their following rate

Usability dimension	Standard description	Following rate
General usability	Do not use the start-up page	100%
	Audio and video will not play automatically when the page is loaded	100%
	When the width of the browser window is set to 1024 pixels, horizontal scrolling is not required	98%
Text hyperlink	All text links are blue	61%
	The color of all text links is different from that of the main text.	89%
	When a link is clicked, the color of all text links changes	28%
	All text links are underlined	52%
Navigation criterion	"Home page" and "return" text link is displayed on the internal page	92%
	Logo or other title graphics are used as the "home page" link side on the internal page	60%
	The main navigation is located at the top and/or left side of the page	100%
	Each navigation group has less than 10 visible items	35%
Readability	The body text remains left-aligned	81%
	Continuous sentences that do not include more than one uppercase text	98%
	Text is not a link, not underlined	90%
Searchability	To view the text can be chosen in a language other than Chinese	00%
	The site is on the front page of Google search results.	98%

Note: Evaluated within the internal page.

As shown in Table 3, the websites are positive in terms of general usability, and avoidance of start-up pages, automatic playback and horizontal scrolling, all of which have a following rate of 98%. There is a large gap between the text hyperlink and the standard, mainly reflected in that the link is not underlined (52%) and the link does not change color after click (74%). Navigation standard "home page" links and positioning standards are well presented (92% and 100%, respectively), but lack graphical aids to return to home page (such as clickable logos, about 40% are missing) and long navigation groups (65%). Most of the websites basically follow the readability standards. About 98% of them are easily retrieved in Google. In general, the usability of information content of the websites is good, but there are still some problems, like the text hyperlink does not change color, the navigation group has few visible items and so on.

Admittedly, the design of these thematic websites directly affects the usability of its information content and shapes their reputation, thus affecting users' sense of trust in e-governance,

which is very important to the success of online emergency management in colleges and universities. Users' experience and trust in the online emergency management of colleges and universities will also be mapped to the colleges and universities themselves, but usability of information content cannot be effective independently, only when combined with the perfect setting of information content can it play its substantive role. Therefore, the setting of information content of the websites should combine perfection and usability, so as to ensure users' online experience and trust.

3.3 Group needs

In order to evaluate the extent to which the thematic websites meet needs of relevant groups, especially the needs of special groups, this study makes coding statistics on relevant information in the websites, so as to clarify the awareness of colleges and universities in meeting different groups' needs. It mainly includes general group, students with psychological problems, international students, students with family difficulties or with disabilities.

Table 4. Proportion of information meeting different groups' need and their evaluation levels

Colony	Proportion	Evaluation level
General group	100%	Very common
Students with psychological problems	26%	Rare
International students	17%	Very rare
Students with family difficulties	7%	Very rare
Students with disabilities	5%	Very rare

As can be seen from Table 4, all websites have strong pertinence to general group, but are weak in the pertinence of special groups. As mentioned earlier, in the process of facing a major epidemic, special groups are more vulnerable to the negative impact of the epidemic, resulting in huge losses, which should be also the focus of online emergency management in colleges and universities. It is as well an important way to enhance the credibility of colleges and universities and cultivate relevant groups' trust. However, according to the coding statistics result, 26% are concerned about students' psychological problems, 17% are concerned about international students, and even fewer are those who are concerned about family difficulties and students with disabilities, which are 7% and 5% respectively. To a large extent, this shows the urgency of improving awareness level of online emergency management in colleges and universities to pay more attention to the needs of special groups.

Because of their more stakeholders, higher education institutions reflect a more complex network of interests. The internal stakeholders include students, teachers and staff of other kinds,

while the external one includes government, parents, news media and so on. Among them, the internal personnel of colleges and universities are the direct stakeholders. If the interests of some special groups are seriously damaged, it will not only lead to loss of the basis of relevant groups' trust in colleges and universities, the resulting public opinion will also push them to a more unfavorable situation. Therefore, the needs of general group and special groups are two important aspects in online emergency management in colleges and universities, and the extent to which the websites meet is one of the key elements to evaluate the effectiveness of emergency management in higher education institutions.

3.4 Democratic interaction

The sustainable development vitality of online emergency management lies in its potential interaction with users, which is the main representation of democratic interaction (Moon, 2002). This study makes clear the potential of democratic interaction with users through the coding analysis of eight interactive ways (seeing Table 5).

Table 5. Proportion of democratic interaction ways and its evaluation grade

Mode	Proportion	Evaluation level
General contact number	93%	Very common
Contact address	85%	Common
General contact mailbox	77%	General
Specific contact number	42%	Rare
Contact email address	36%	Rare
Online psychological counseling	14%	Very rare
Online survey	8%	Very rare
Online Q&A	4%	Very rare

Overall, most of the thematic websites have general contact information and address, with 42% by telephone and 36% by mail. This means although the current online emergency management in colleges and universities provides a general way of democratic interaction and gives the possibility of democratic interaction. In addition, the websites rely more on the traditional democratic interaction, such as telephone and email, while the online instant interaction provided for relevant groups is really limited, with only 14% of online psychological counseling, 8% of online surveys and 4% of online questions. This can be inferred that online emergency management of most colleges and universities do not realize the important role of information technology applications, such as social media platforms, public opinion monitoring and new media in the process of major epidemic

response, and still do not pay enough attention to it. Many studies have shown that information technology can control the negative impact of public opinion in the process of dealing with major epidemics, reduce the public panic, transfer correct prevention and control knowledge and strategies, and improve relevant groups' awareness and ability of self-prevention and control, reduce the spread of rumors from the source, advocate rational epidemic prevention and control, so as to achieve the ultimate goal of less contact and infection (Fuji & Jinhua, 2018; Kostkova et al, 2014).

3.5 Cultural governance

Cultural governance is an inclusive factor affecting online emergency management in higher education institutions. As mentioned earlier, in terms of the representation form, it has four

characteristics: local roots, elastic governance, flexibility and precision and the formation of characteristics. In this study, through purposeful sampling, two thematic websites are selected as the cases for analyzing cultural governance. One of them, located in Hubei Province of China, the hardest hit by this epidemic, is a comprehensive research university. Its online emergency management is based on the current epidemic situation, that is, the pressure of campus management has shifted to social services and publicity and education for students. It has been rooted in local cultural traditions and cultural characteristics to build a unique elastic governance model, and to infiltrate the cultural elements into all aspects of emergency management, especially in the work progress, scientific research, voluntary service, express news of beating COVID-19, publicity and education is particularly prominent. As this sampling university is in the hardest-hit area of COVID-19 epidemic, the society there is facing a huge pressure of emergency response and is in urgent need of the support of a lot of manpower and material resources from the outside areas. It focuses on three projects of constructing donation management system, social service system and online psychological counseling service to flexibly and accurately respond to the epidemic change, in order to give full play to the function of social service in higher education institutions. Obviously, its construction of cultural governance strategies and methods is mainly based on the actual situation of the epidemic change and rooted in the existing cultural traditions and characteristics. Dealing with the current sudden major epidemic, it is more flexible, accurate and flexible, and has formed its own characteristics in the process of taking root in the local culture.

The other one is in the non-epidemic hard-hit area, and its cultural governance mode of online emergency management is quite different from the former, which is mainly reflected in two aspects. First, a donation management system has not been formed. The main reason is that the severity of epidemic in this area is relatively small. Second, it highlights the characteristics of "teaching anti-COVID-19". This university is a normal & research university. Relying on its own characteristics and advantages, it has constructed a multi-center and multi-characteristic, dual structure of "teaching anti-COVID-19" with each school as a center. Different schools implement epidemic prevention and control according to their own professional characteristics. Take School of Education for example, which focuses on pedagogy and online

course organization in the fight against COVID-19, to share the latest coping strategies and research results; another example is the School of Psychology, which interprets psychological coping and self-epidemic prevention from the perspective of psychology; and one more instance is the School of Fine Arts, which pays more attention to creation of artistic works about epidemic prevention and control. Like the former, a relatively complete social service system has been established, which is not only for the university faculty and staff, but also for various communities, especially for the ones in the hard-hit areas. This university is rooted in its own normal, research and service-oriented characteristics, and has constructed a multi-center and multi-characteristic elastic governance system with each school as a unit, which has realized flexibility and precision of online emergency management to a large extent, and formed its own characteristics as well.

The above two sampling universities are the cases in which online emergency management of colleges and universities in mainland China has achieved remarkable results in terms of cultural governance. On one hand, they accurately judge and accurately locate their own roles and practical paths according to the actual epidemic changes. Instead of blindly catering to administrative requirements, on the other hand, two sampling universities' cultural governance is deeply rooted in their own cultural traditions and professional characteristics, creatively highlighting the characteristics of online emergency management. From perspective of Gene-therapy-oriented management, the two universities' online emergency management models avoid the influence of adverse factors, misjudgment or misjudgment to a large extent (Ha, 2016). Cultural governance has been used to transform uncertainty in emergency management into certainty and feasibility based on their own advantages and characteristics.

4 Conclusion and suggestions

According to the analysis framework constructed, this study has analyzed the current situation of online emergency management in Chinese higher education institutions from five aspects. The five questions and hypotheses proposed earlier are to be answered and tested one by one, and corresponding suggestions will be put forward as follows.

4.1 The degree of institutional collaboration is relatively high

As far as the first question is concerned, results show that more than 90% of colleges and universities have close ties with government departments, and 60% of them have close ties with health institutions, non-governmental organizations and other higher education institutions. Therefore, there is a high degree of contact between institutions in the thematic websites. This conclusion shows that hypothesis 1 is supported, that is, the degree of collaboration between university-centered agencies is high.

As the analysis framework shows, collaboration of online emergency management institutions is essentially a sustainable cooperation network with all subjects, all risk elements and the whole process. From the attribute of higher education institutions, emergency management is essentially organizational emergency management, but colleges and universities do not have a complete power to deal with the crisis (Yifan, Zekai, 2008). And meanwhile, due to the limitations of emergency management capacity of them, it determines their dual role in emergency management, both being the main role of mainly responsible for and implementation of emergency management, and also being the intermediary role of coordinating the relations and resources of all sides.

Based on the conclusions above, this study puts forward three suggestions. First, through the establishment of "one plan and three systems", that is, emergency plan and emergency management system, mechanism, legal system, the main and intermediary role of colleges and universities can be clarified, and plans can be formulated according to different types and scale of public emergencies. Second, a multi-subject pattern should be built, an emergency linkage mechanism should be established, the responsibilities and rights of each subject should be clarified, relevant institutions or organizations should be brought into, and a huge joint role should be played. Third, to establish a flexible and accurate decision-making participation mechanism, in order to accurately respond to major epidemics and avoid waste of social resources, colleges and universities should, on the basis of referring to existing plans, focus on considering the changes of epidemic situation and their own advantages and urgent needs, establish a decision-making participation mechanism of institutional collaboration, thus achieving efficient, timely, accurate and orderly online emergency plans.

4.2 The information content is limited, but the usability is good.

In order to answer the second question and test hypothesis 2, this study diagnosed the content type and usability of the thematic websites. Results show that this hypothesis is not completely true, meaning that the type of information content is limited but the usability is good. The diagnosis results show although all the websites contain basic information, but most of them ignore rumor refutation, psychological counseling, donation information, health information reporting and special columns. Therefore, the results support that "information content is limited", while show the usability is good, negate the "poor usability". At the same time, the design of most thematic websites provides a better experience for users, which shows its friendliness.

Reviewed from the analysis framework, high-quality and real-time information content is a major decisive factor affecting the democratic interaction between higher education institutions and relevant groups. Based on improving the institutional collaboration mechanism, these thematic websites are to improve their awareness of the type, richness and usability of information content, and further optimize the setting of information content, so as to achieve full-time and multi-channel information service level. At present, online emergency management in colleges and universities should focus on enriching rumor-refuting, blocking the negative effects of rumors, enriching psychological counseling information, paying attention to the needs of the masses, setting up open and transparent donation information according to actual situation, and setting up health information reporting columns. Publicizing work progress and statistical data, and establishing special columns may well be necessary to form a cultural atmosphere for sound epidemic prevention and control.

4.3 The attention to needs of general group are paid while the needs of special groups are limited.

Based on the answer and diagnosis of this question, results verified hypothesis 3, that is, the thematic websites cannot meet the needs of special groups well. Through coding analysis of the websites' content, it can be found that only 26% of colleges and universities pay attention to students' psychological problems, 17% of them pay attention to international students, and very few pay attention to students with family difficulties and disabled students. Obviously, paying attention to the needs of special groups is the deficiency that needs to be improved right now. As far as the group characteristics of colleges and universities are

concerned, students are the main objects of online emergency management services. Student mass have active but immature ideas, high information sensitivity but discrimination. They pursue democracy but are not good at using it. They are prone to express strong but more radical wishes. In particular, when the interests of special groups around them are seriously damaged by a major epidemic like COVID-19, it may aggravate the causes of this mass group, and then affect the nature and even the future trend of public health emergencies.

From the perspective of analysis framework, meeting the needs of general and special groups is not only the main vision of online emergency management in colleges and universities, but also an important means and way to realize two-way communication between higher education institutions and the public. Similar with information content, whether it can meet the needs of special groups and its degree of satisfaction is affected by institutional collaboration to a large extent. If non-governmental organizations can be brought into online emergency management decision-making and implementation, it will be more difficult to ignore the needs of special groups.

Undoubtedly, meeting group needs is one of the key factors affecting the effectiveness of online emergency management in higher education institutions. On the basis of building a multi-subject pattern, colleges and universities should strengthen their attention and service quality to special groups, make full use of new media forms and the characteristics of big data to accurately locate the needs of general group and special groups, reasonably distinguish the service contents of the two, and establish a confidentiality mechanism for special groups' relevant information, so as to more fully take care of special groups of their psychological characteristics and practical needs.

4.4 The characteristics of democratic interaction are obvious, but the interaction supported by information technology is limited.

In order to answer the fourth question and test hypothesis 4, this study diagnosed the democratic interaction of the thematic websites. Results showed that the democratic interaction of the websites depends heavily on traditional ways, while the application of information technology is extremely rare. Combined with the analysis framework, democratic interaction is an important part of emergency management in colleges and universities. It is not only the output of information content or group needs of online emergency management, but also a prerequisite for two-way

communication between higher education institutions and relevant groups. The democratic interaction ways and frequency of the websites only provide basic conditions for the possibility of interaction, and the occurrence of democratic interaction still depends on how the online emergency management can improve the trust and participation enthusiasm of users by publishing information content and meeting the needs of different groups, so as to promote the realization of democratic interaction. As mentioned above, the realization of this process is inseparable from the important role of institutional collaboration, and it will promote the further optimization of institutional collaboration mechanism as well, thus forming a virtuous circle.

Therefore, democratic interaction of the thematic websites should fully integrate the advantages of traditional methods and information technology. First, the websites should provide the function of online anonymous comments and endow the websites with the form of two-way communication, because anonymity can better enhance the beliefs, emotions and opinions of users who wants to express, and can help form an independent public opinion. Meanwhile, the websites should be interfaced with other mainstream online social media platforms, to diversify the forms of democratic interaction. Then, big data analysis and text mining technology of public opinion monitoring may also be employed to accurately locate users demands, improve the quality of democratic interaction and two-way communication, and control the value orientation of the users. Finally, attention to application of new media technology should be paid to improve users' experience, augment the initiative of democratic interaction.

4.5 The local-rooted cultural governance model is prominent

For the fifth question and hypothesis 5, this study selected two thematic websites through purposeful sampling and made a case analysis. Results show that hypothesis 5 was not true, which means there exist characteristics of cultural governance in the websites. From the perspective of analysis framework, the result of case study confirms the sampling colleges and universities' cultural governance at a practical level, and it is also a demonstration of the practical path in line with the characteristics of higher education institutions, including two bases (actual epidemic situation and cultural characteristics of the colleges or universities), and dual structure (multi-center,

multi-characteristic). Among them, the dual structure characteristics of cultural governance have abandoned the "centrism" of traditional online emergency management, that is, taking one governance element as the "center" and the other elements as the "edge". This model will inevitably lead to incomplete function of governance structure (Gang, 2005). When the dual structure build a multi-center and multi-characteristic model with community as a unit, it is possible to fully tap the potential value and role of governance elements, which has strong theoretical value and practical significance.

Based on the discussion above, this study suggests that colleges and universities should fully understand the importance and value of cultural governance, implement accurate and flexible management according to the epidemic changes, take root in the local culture, and actively explore the path of cultural governance, so as to form their own characteristics and even culture of epidemic prevention and control. Hence, colleges and universities should apply cultural governance to daily management to form a practical path of cultural governance with high adaptability. Finally, online emergency management of them should integrate the elements of cultural governance into every detail, thus improving cultural affinity and appeal of the management and realizing the state of moistening things silently.

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